



ACTIVITY GUIDE FOR TEACHERS

A teacher's guide developed by the National Park Service
and funded by the National Park Foundation





The National Park Service follows guidelines set by the Organic Act, which was passed by Congress on August 25, 1916. The act states, "The Service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments and reservations...which purpose is to conserve the scenery and the natural historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Parks As Classrooms is an educational initiative of the **National Park Service** in partnership with the **National Park Foundation**.



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FOREWORD

Lassen Volcanic National Park is a unique outdoor classroom rich in natural and cultural resources. The park was established by an Act of Congress on August 9, 1916 to protect the site of the then most recent volcanic activity in the contiguous United States and its related biotic and cultural resources for the benefit and enjoyment of its visitors.

Besides the diversity and complexity of volcanic features, Lassen is a biological crossroads which blends together the wealth of the Cascades, Sierra Nevada, and Columbian Plateau biotic provinces. The cultural significance of the park lies in its long history of Native American use. Pioneer heritage is also evident along the 23 miles of the historic Nobles Emigrant Trail winding through the park.

Lassen Park is a vast resource and magnificent environment. It is an area that if treated with respect and care will be a point of inspiration for generations far into the future. This respect and care can only come from educating the area's future managers and users.

ACKNOWLEDGEMENTS

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INTRODUCTION TO USING THIS GUIDE

Welcome to Lassen Volcanic National Park. We are delighted that you are taking the opportunity to use National Park Service resources to enhance the classroom learning experience.

Activities in the guide have been designed to be easily adapted to meet the needs of a wide range of grades without much modification by the teacher. The activities are appropriate for use with students in grades four through twelve. Any part of the guide can be pulled out for specific study. All of the materials are interdisciplinary. They are intended to supplement and enrich existing curricula.

The objectives of this guide are to:

1. Provide teachers and other educators with classroom and onsite activities about Lassen Park
2. Acquaint students with some of Lassen Park's volcanic and human history through hands-on activities
3. Develop within students an awareness and understanding of the value of Lassen Park and the National Park System
4. Enhance and enrich student educational learning experiences
5. Direct students toward actions they can take to protect the park

UNIT OVERVIEW

This guide has been organized into four units to better serve the teacher. Each unit has been designed to stand alone as an educational device or to be used in conjunction with other units of study.

Unit I - Volcanoes contains activities that introduce students to the fascinating history of Lassen Peak's eruption and the park's extensive hydrothermal features. Lassen Volcanic National Park is world famous for its volcanic wonders and represents an outdoor classroom for students of all ages.

Unit II - Native Americans represents an important part of Lassen's rich cultural heritage. The area that is now Lassen Park was once a crossroads of Native American culture. Students will learn about Native Americans through a variety of hands-on activities that are both fun and educational.

Unit III - Pioneers focuses on the hardships and travels of those hardy individuals who traveled west in search of a new life. Approximately 23 miles of the historic Nobles Emigrant Trail run through Lassen Park. This trail established in 1852 was an offshoot of the California trail which led thousands of pioneers into Northern California in the 1850s and 1860s. Students will learn about the hardships of pioneer travel through a variety of interdisciplinary activities. They will role play pioneer life and learn how and why these pioneers traveled west.

Unit IV - The National Park Idea includes activities that provide students with creative ways to learn about the concept of national parks. The establishment of the National Park System is truly an American idea. National parks have been established and modeled after our National Park System all over the world. Through classroom and onsite activities, students explore and discover the National Park Idea.

ASSESSMENT

There are many assessment items embedded into the Lassen activities. These include student products, presentations, and written records of activities and projects. Suggestions for portfolio artifacts are made throughout the materials. Teacher and student expectations for activities will need to be established prior to doing the activities to provide clear guidelines for successful completion.

The following assessment tools may be used to gain a broad view of the student's work:

1. Keep track of what students accomplish and are able to do during experiments, investigations, field work, readings, and research. Let students know regularly how they are doing. Are they making the most of their time and resources?
2. Create open-ended questioning strategies that encourage students to think about problems. Allow for a variety of answers that show creativity, imagination, and an understanding of the problems posed.
3. Create situations for groups of students to work together to solve problems, test hypotheses, and discuss results. Evaluate group performance as part of the assessment.
4. Have every student keep a notebook for evaluation purposes to encourage the use of writing as a thinking/problem solving tool.
5. Be sure that students evaluate their own work on a regular basis. Let them assign grades. You can work with them to set up parameters, and then let them decide the quality of completed work.
6. Drawings, charts, tables, and other visual representations of work provide important assessment tools. Encourage their use.
7. Have students develop their own problem solving techniques when faced with problems and issues related to their studies.
8. Pre and post tests provide useful information but need to be used in conjunction with other assessment tools.

Student portfolios provide a place to collect student work that shows efforts, progress, and achievement over time. Four areas to be included in the development of portfolios are:

- Student participation in selection of portfolio items
- Criteria for selection
- Criteria for judging merit
- Evidence of student self-reflection

Products for student assessment might include:

| | | |
|--------------------------|-------------------------|-------------------------|
| advertisements | graphic design | pre and post test |
| board games | guest speaker | poster |
| book cover | haiku | puppet and/or show |
| book review | history of person/place | puzzle |
| bulletin board | independent experiment | questionnaire |
| card game | invention | questions |
| charcoal sketch | journal | radio show |
| chart | labeled diagram | recipe |
| collage | large scale drawing | reference file |
| collection with labels | lecture | relief map |
| collection and narrative | lesson | rubbing |
| comic strip | letter to the editor | science fiction story |
| computer program | magazine article | scrapbook |
| court trial | map with legend | sculpture |
| crossword puzzle | mobile | short story |
| dance | model | silk screening |
| debate | movie | skit |
| detailed illustration | mural | slide/tape presentation |
| diagram | museum exhibit | small scale drawing |
| diary | musical composition | song |
| diorama | newspaper article | stitchery |
| display | news report | survey |
| drama presentation | oil painting | taped recording |
| dramatic monologue | oral report | teach a lesson |
| dramatic set design | package for product | terrarium |
| editorial | painting | test book |
| effigy | pamphlet | travelogue |
| etching | pantomime | TV documentary |
| fable | photo essay | TV newscast |
| fact file | photographs | videotape |
| film | picture book | vocabulary list |
| film strip | play | water color |
| glossary | poem | written report |
| graph | | |

A thought to consider when working with students:

When the famous physicist, J. Robert Oppenheimer, was asked why he decided to study physics, he answered that his teachers allowed him the exhilaration of his own discoveries, and when one experiences that exhilaration, he becomes a learner for life. The most we can do for our students is to model lifelong learning and support them as they find the exhilaration of their own discoveries. Assessment can and must be part of the learning.

Some of the ideas included here are taken from the Northwest Integrated Concept/Process Hands-on Environmental Science Curriculum Guide, distributed by the USDA-Forest Service, Mount St. Helens National Volcanic Monument.

VOLCANOES OF LASSEN

SUMMARY: Students will learn how volcanoes are formed through a hands-on demonstration.

GOAL: To increase student awareness and understanding of the processes that created the four major types of volcanoes found in Lassen Volcanic National Park.

OBJECTIVES: By the end of the demonstration, students will be able to (1) name the four major types of volcanoes found in the world and in Lassen Volcanic National Park, (2) describe how each of the four types of volcanoes are formed, (3) define the following terms: lava, magma, volcano, volcanic crater, volcanic vent, and volcanologist, (4) name and identify at least two kinds of volcanic rocks: basalt, andesite, dacite, pumice or cinder (upper grades).

GRADE LEVEL: Second through twelfth

TIME REQUIRED: 30 to 60 minutes

LOCATION: Classroom or field site

MATERIALS: Total cost is about \$20. (1) Volcano model made of 2'x2' piece of strong flat cardboard with a hole cut in the center to fit a one-pound coffee can. Cut both ends out of the can and push it up into cardboard with 3/4 of the can projecting above the top of the cardboard. Place sturdy paper plates around coffee can leaving the opening free to form a volcano shape. Secure paper plates to coffee can and cardboard base with strapping or masking tape. After all plates are in place, cover plates and cardboard base with plastic coated packaging tape. (2) Can of shaving cream. (3) Large tube of toothpaste. (4) Package of Sugar Pops or round puffed corn cereal. (5) Small funnel to fit in top of volcano (top of can). (6) Package of paper towels and plastic disposal bag. (7) Air or foot pump with extension tube. (8) Rock types: basalt, andesite, dacite, cinder, and pumice (optional). Rock types can be purchased through various educational supply companies. **Remember collecting rocks in Lassen Volcanic National Park is not allowed.** (9) Picture, puzzle, or model showing the inside of a volcano.

SUBJECTS: Earth Science, Geography, Geology

KEY WORDS: Lava, Magma, Volcano, Volcanologist, Basalt, Andesite, Dacite, Cinder, Volcano Crater, Vent

BACKGROUND: Teachers should read handouts on volcanoes provided by the park that define the terms and processes forming the four types of volcanoes (cinder cone, shield, plug dome, and strata cone or composite). Associated rock types should also be identified if used.

INSTRUCTIONAL SEQUENCE: (1) Using a picture, puzzle, or drawing of a volcano, have students explain what a volcano is. Define the terms: volcano, magma, lava, crater, and vent. Explain how a volcano is formed using these terms and answers given by the students. (2) Explain that you will demonstrate (with their help) how the four types of volcanoes are formed. (3) Proceed to demonstrate the four types of volcanoes. With each demonstration you will need two students to hold the volcano model and one student to demonstrate the eruption sequence. (4) Demonstration sequence follows.

Plug Dome Volcano (a) Explain that the magma and lava pushing up through the vent is like chunky peanut butter or toothpaste. Place a tube of toothpaste under and up through the center of the volcano model. Make sure the top of the toothpaste tube is above the rim of the model. Slowly squeeze the toothpaste tube so that the toothpaste comes out of the tube without going down the side of the tube. (b) Tell the children that this is how a plug dome volcano pushes up and is formed. Explain that because the magma moves slowly up through the volcano like toothpaste, pressure builds up within the earth, which usually results in a violent eruption. This thick pasty magma and lava cannot move very fast or travel very far down the side of the volcano. Since the magma moves slowly up through the volcano, larger crystals are able to form in the cooling magma, forming dacite lava rock. The magma reaches a temperature of 1500° F and is not as hot as other magmas. The lava, as can be seen from the demonstration, pushes up as a large mass forming a dome and as it cools it plugs the crater vent creating a plug dome volcano. (c) Show the students a piece of dacite lava. Name some famous plug dome volcanoes in Lassen Volcanic National Park: Lassen Peak, Chaos Crags, and Bumpass Mountain.

Shield Volcano (a) Shake the can of shaving cream well and place it under and up through the center of the volcano model. While the teacher holds the shaving can in place, have the student, who is demonstrating the shield volcano eruption, press on the shaving can to release the shaving cream. (b) Have students note the large volume of lava coming out compared to the plug dome volcano. The lava is hotter (2000° F.) and comes out quicker so no crystals are formed. Consequently, it flows easier and travels further forming a river of lava and a very large broad based volcano. Ask students if the eruption is pahoehoe lava or aa lava. Note: Pahoehoe lava is smooth in appearance; AA lava is jagged and sharp in appearance. Both are basalt type lavas. (c) Show a piece of basalt rock; note that there are no crystals in the rock since the lava cooled too quickly for them to form. (d) Name some famous shield volcanoes: Mount Harkness and Prospect Peak (in the Park), Mauna Loa, and Mauna Kea (in Hawaii).

Cinder Cone Volcano (a) Place a funnel on top of the volcano model. Connect a small air pump with the tube under and up through the model to the funnel opening. Place Sugar Pops, Rice Crispies, corn puffs, or any other light, dry cereal in the funnel. Activate the foot pump by having a student press down on it, which will result in the cereal being blown out simulating a cinder cone eruption. Have students pick up the cereal off the floor. Do not allow students to eat the cereal. (b) Share a piece of cinder volcanic rock. Have students note that there are lots of holes in the rock due to the magma having lots of gas in it. The holes are where gas bubbles once existed. The gas helped create this type of lava and eruption. It is like popcorn popping; it throws the erupting cinder lava out of the crater forming a cinder cone with an open crater in the center. (c) This is the most common type of volcano in the world. Name some famous cinder cones in the Park: Hat Mountain, Cinder Cone (near Butte Lake), and Fairfield Peak.

Composite or Strato Cone Volcano (a) Demonstrate any two or three of the previous volcano demonstrations in sequence to simulate the formation of a composite volcano, which is a combination of the other three types. This type of volcano is long lived and forms over many centuries. A common type of lava associated with this type of volcano is andesite. Composite volcanoes may have cinder cones on their tops. Name some famous composites outside the Park: Mount Shasta, Mount St. Helens, and Mount Rainier. A composite volcano within the Park: Mount Tehama; remnants of this volcano include Brokeoff Mountain, Mount Diller, Pilot Pinnacle, and Mount Conard. The Sulfur Works Thermal Area may have been its central vent area.

EXTENSION/ENRICHMENT: (1) Have students draw pictures of each of the four types of volcanoes. (2) Have students look up stories about famous volcanoes and their eruption history in a reference book or on the Internet and share with the class. (3) Have students demonstrate the shapes of the four types of volcanoes with body movement. Example: outside the classroom, students could do “jumping jack” type exercises demonstrating the shapes of the four types of volcanoes. Or students could do walking-type exercises demonstrating volcano lava flow: fast walk (shield volcano), explosive walk (cinder cone), slow walk (plug dome), and fast-explosive-slow at random walk (composite volcano).

ASSESSMENT: (1) Have students name and describe the four different types of volcanoes in writing or oral presentations. (2) Have students draw pictures of each type. (3) Have students write a story about the eruption sequence of one or more of the volcano types. (4) Have students locate and identify two or more of the volcano types demonstrated in this activity on a Lassen Volcanic National Park map.

EARTH COOKIES

SUMMARY: Students will classify and compare cookies and rocks according to their structure and composition.

GOAL: To enrich student understanding of how igneous rocks are formed and why their structure and composition results in different characteristics

OBJECTIVES: Students will compare and contrast different types of cookies and igneous rocks and classify them according to their structural make-up and ingredient composition.

GRADE LEVEL: Fourth through Twelve

TIME REQUIRED: 45 minutes

LOCATION: Classroom

MATERIALS: Cookies (see note under preparation), paper towels, two sets of four different types of igneous volcanic rocks (basalt, andesite, dacite, cinder, pumice, etc.), one metamorphic rock, one sedimentary rock, recipe page, worksheets, pencils

SUBJECTS: Science, Language Arts

KEY WORDS: Structure, Composition, Characteristics, Classification, Minerals, Ingredients, Igneous, Sedimentary, Metamorphic

BACKGROUND: Although the average student is relatively unfamiliar with rocks, especially their composition and formation, most students are very familiar with cookies. In actuality, cookies and rocks have many similarities, especially in the ways that they are formed. For this reason, a careful study of cookies provides a great introduction to rock formation and structure.

The building blocks of cookies are flour, butter, eggs, sugar, and baking soda. When the ingredients are mixed together, they create a substance that is not at all like the individual ingredients. The texture changes when the dough is heated. The exact same dough will produce very different results depending on the amount and type of heat to which it is exposed (the gooey cookie, the perfect cookie, the burnt cookie).

The process that produces cookies is similar to that which produces igneous rocks. The building blocks of rocks are various minerals. These ingredients can be mixed together to produce a variety of rocks. The degree of heat, water, pressure, and friction change the characteristics of the rocks, as does the way the rock cools.

Rocks can be classified using many criteria including but not limited to: weight, color, hardness, and where and how they originated. Rocks are classified into three main groups: sedimentary, metamorphic, and igneous rocks.

Sedimentary rocks are formed when different materials are laid down one on top of the other. They are characteristically layered and are formed by either deposits of previously weathered rocks, dead marine organisms, or crystallized chemical precipitates. Sandstone, shale, and limestone are examples of sedimentary rock.

Metamorphic rocks are made deep in the earth. Any kind of rock can be turned into a metamorphic rock by heat, pressure, or penetration of hot fluids. For example, shale will metamorphize into slate, sandstone becomes quartzite, and limestone will alter to marble.

Igneous rocks are made from magma that has cooled and solidified. When it cools beneath the surface, it is called intrusive igneous. Generally, intrusive magmas cool deep within the earth in an insulated environment. Crystals have time to grow large enough to be seen without magnification. When magma cools above the surface it is called extrusive igneous. This magma cools very rapidly when exposed to air resulting in smaller crystals or no crystals at all. Crystals do not have time to form. Granite is an example of intrusive igneous rock. Basalt and dacite are examples of extrusive igneous rocks.

INSTRUCTIONAL SEQUENCE:

1. Preparation of cookies. This activity will be more meaningful if the students make the cookies instead of buying them. Ask for student volunteers to make cookies the day before you do this activity. Enough cookies should be made so that there will be one of each type per student. Simple recipes for the four cookie types needed are included on the Recipe Page. You can photocopy individual recipes and send them home.
2. Discuss the differences between the three rock types and introduce the lesson. Explain that the students are going to learn more about igneous rocks, specifically the extrusive rocks that come out of volcanoes.
3. Pass out the cookies, paper towels, pencils and the Cookie Worksheet. Instruct the students to observe the cookies carefully. Many of the questions do not have right or wrong answers. Have students fill out the worksheet.
4. Put the rocks out on a table. Label and number the rocks 1 through 4.
5. Working in groups or individually have the students observe the rocks and fill out the Rock Worksheet.
6. When all the students have completed their worksheets, discuss their findings. Compare and contrast the similarities between the two mediums.
7. When finished with the activity, eat the cookies!

EXTENSION/ENRICHMENT: (1) At home students can experiment with cookie dough. Try changing the composition just slightly and see what happens. Bake them at a higher or lower temperature, bake them for shorter or longer than called for, melt some cookie dough in a pot on the stove top, bake a cookie in a microwave, or throw a hot cookie in the air. What happens to it? (2) Have the students look for igneous rocks in their neighborhood and bring them to class.

ASSESSMENT: Students describe and list three similarities between cookie and igneous rock formation. Have students describe how they identify the differences between different igneous rocks. Have the students write a story about the formation of a volcanic rock.

COOKIE WORKSHEET

Name of Cookie Connoisseur _____

Rocks are similar to cookies in many ways. They differ in ingredients and the temperature that they are heated. They are made and react to heat much like kitchen-made cookie dough. Use the most descriptive words you can think of to describe the following:

| | Sugar | Peanut Butter | Chocolate Chip | Oatmeal |
|-----------------|-------|---------------|----------------|---------|
| Smell | | | | |
| Shape | | | | |
| Color | | | | |
| Texture | | | | |
| Main Difference | | | | |

Look at the recipe sheet and list the ingredients that are common to all the cookies:

Which cookies are the most alike? _____ Why?

Which cookies are the least alike? _____ Why?

Does cookie dough look like the finished cookie? ____ Why or why not?

How would the cookies be different if you baked them (a) for half the time the recipe called for? _____ (b) for twice as long as the recipe called for? _____ (c) at a lower temperature? _____ (d) at a higher temperature?

What would happen to the chocolate chip cookie dough if you heated it in a pan on the stove top?

What would happen to the chocolate chips in the dough if they were heated together on the stove top and stirred?

Break one cookie in half. Is the texture on the inside the same as on the outside?

If you took a cookie hot out of the oven and threw it in the air, do you think it would change shape? ____ What would happen when it landed?

ROCK WORKSHEET

Name of Rock Hound

You should have four rocks. Number them 1 through 4.

Use the most descriptive words you can think of to describe the four rocks.

| | 1 | 2 | 3 | 4 |
|-----------------|---|---|---|---|
| Smell | | | | |
| color | | | | |
| Shape | | | | |
| Texture | | | | |
| Main Difference | | | | |

Can you see any minerals common to all the rocks?

List anything you see that they have in common.

Which rocks are the most alike?

Why?

Which rocks are the least alike? _____ Why?

Do you think the magma looked like the solid rock does now?

Pick a rock with crystals. Do you think it cooled quickly or slowly?

Why?

Do you think the magma that made this rock would look the same if it was thrown up in the air while still hot?

Pick another rock. If you were able to stick it into a magma chamber, would it look the same when it came out and cooled as it does now? _____ Why or why not?

List similarities between cookies and igneous rocks.

RECIPE PAGE

Sugar Cookies

| | |
|--------------------|---------------------|
| 1 cup butter | 1 cup sugar |
| 2 eggs | 1 Tbsp water |
| 1 tsp vanilla | 1 tsp baking powder |
| about 3 cups flour | |

Cream butter and sugar together. Beat in vanilla, water, and eggs. Sift in dry ingredients gradually. Roll out to 1/4 inch thickness. Cut in desired shapes or with cookie cutters. Put on ungreased baking sheet. Bake for 10 minutes at 375 degrees.

Peanut Butter Cookies

| | |
|----------------------------|---------------------|
| 1 cup chunky peanut butter | 1/2 cup butter |
| 1/2 cup sugar | 1/2 cup brown sugar |
| 1 egg | 1/2 tsp salt |
| 1/2 tsp baking soda | 1/2 tsp vanilla |
| 1 to 1 1/2 cups flour | |

Cream butter and sugars together. Beat in egg, peanut butter, salt, baking soda, and vanilla. Sift in flour. Roll into small balls and place on ungreased cookie sheet. Press flat with a fork. Bake 10 to 12 minutes at 375 degrees.

Chocolate Chip Cookies

| | |
|-----------------------|----------------------------------|
| 1 cup softened butter | 3/4 cup white sugar |
| 3/4 cup brown sugar | 1 tsp vanilla |
| 1/2 tsp water | 2 eggs |
| 2 1/4 cups flour | 1 tsp soda |
| 1 tsp salt | 12 oz semi-sweet chocolate chips |

Cream butter and sugars together until well blended. Add vanilla, water, and eggs. Beat until creamy. Add flour, salt, and soda. Stir. Add in chocolate chips. Drop by teaspoons onto ungreased cookie sheet. Bake for 10 to 12 minutes at 350 degrees.

Oatmeal Cookies

| | |
|-------------------------|----------------------------|
| 1/2 cup butter | 1/2 cup packed brown sugar |
| 1/2 cup white sugar | 1 egg |
| 1 tsp vanilla | 1 Tbsp milk |
| 1 cup flour | 1/2 tsp baking soda |
| 1/2 tsp baking powder | 1/2 tsp salt |
| 1 cup quick rolled oats | |

Cream butter and sugars together until well blended. Add vanilla, egg, and milk. Sift dry ingredients together. Stir until smooth. Add oats. Drop by teaspoons onto ungreased cookie

sheet. Bake for 10 to 12 minutes at 350 degrees.

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NATURE'S PALETTE

A Field Study of a Hydrothermal Area

SUMMARY: Students will visit an active hydrothermal area in Lassen Volcanic National Park to identify the main features and learn about the chemical processes forming these areas.

GOAL: To introduce students to the features and processes that have shaped and reshaped Lassen Volcanic National Park's hydrothermal areas.

OBJECTIVES: By the end of the activity students will be able to: (1) Identify and describe three common hydrothermal features. (2) Name at least three colors found at the hydrothermal features and use the key to identify the processes which created them. (3) Explain two important safety rules for enjoying and learning about the hydrothermal areas. (4) Explain two reasons why it is important to protect the park's hydrothermal features. (5) Explain two ways an individual can assist in preserving them.

GRADE LEVEL: Fifth through twelfth

TIME REQUIRED: 30 to 60 minutes

LOCATION: Lassen Volcanic National Park hydrothermal areas (Bumpass Hell, Sulphur Works, Devils Kitchen)

MATERIALS: Hydrothermal Area Field Study Page and Color Key Fact Sheet - one each per student. A pencil and note pad, or clipboard to be used at the field site by each student.

SUBJECTS: Earth Science, Geology, Chemistry

KEY WORDS: Volcano, Hydrothermal, Magma, Lava, Fumarole, Mud pot, Boiling Springs, Chemical Compounds, Minerals

BACKGROUND: Volcanic areas do not always die silently. Magma at depths of only a few miles can take thousands of years to cool. The fumaroles, boiling springs, and mud pots in the park's hydrothermal areas testify to the landscape's recent volcanic origin. Rain and melted snow percolate deep into the earth where the water is heated by a mass of hot rocks from magma six to twelve miles below the surface. The Lassen hydrothermal system consists of a lens-shaped reservoir of groundwater deep within the Earth. Steam as hot as 464 degrees F rises and condenses into water again, mixing with percolating ground water nearer the surface. The mixture produces sulfate water that boils at elevated pressure at about 200 degrees F. All of the park's hydrothermal areas are connected underground and fed by the same hydrothermal reservoir. Features such as fumaroles, mud pots, and boiling springs often occur side by side at the same site. These features are in constant change due to groundwater conditions, chemical weathering, and earth movement.

INSTRUCTION SEQUENCE: In the classroom, discuss information about the park's volcanic features and its hydrothermal areas with the students. Discuss why it is important to Preserve and Protect these unique hydrothermal features. Before entering any of the hydrothermal areas, please go over all park rules with the students. It is extremely important that everyone knows the rules and agrees to follow them. Please go over the following rules with the students.

Throwing rocks, sticks, trash, or anything else into the boiling springs, mud pots, or fumaroles is not allowed. In National Parks all natural and cultural features are protected by law. Think Safety! Stay on the trail and boardwalks at all times. No running or fooling around. Do not touch the water or other features in the hydrothermal areas. They may be hot and contain harmful chemicals. Visiting hydrothermal areas like Bumpass Hell or Sulphur Works can be a fun, safe, and educational experience if everyone follows the rules. Breaking the rules could result in severe burns and personal injury.

NOTE: Bumpass Hell is named after Kendall V. Bumpass, the first pioneer to discover the hydrothermal area. The story told is that Mr. Bumpass “walked off the trail,” and fell through some thin crusted ground and plunged his leg into a boiling spring. He was burned severely.

At the trailhead parking area or the entrance to the hydrothermal area make sure all of the students are clear about the rules. Divide the class into small working groups of two to four students, or have them work individually. Tell the class they are going to be geologists studying the hydrothermal area in the park. Pass out the Hydrothermal Area Field Study Page. Read and discuss what the students will do in the field. Explain that each group is to record their observations using the Field Study Page. Set a time limit. When everyone is finished, collect the study pages. Explain that the results of their observations will be discussed back in class.

When back in class, pass out the Study Pages from the field trip. Discuss and review what they saw and experienced. Pass out the Color Key Fact Sheet. Using the Color Key, have the students write down the answers for the colors they observed at the hydrothermal area in the column “How were the colors formed?” on their Field Study Pages. Discuss the results with the class.

EXTENSION/ENRICHMENT: (1) Have students research other national parks that have hydrothermal areas and compare them to the features at this park. (2) Have students write a poem based on their field trip experience. (3) Have students imagine that they are newspaper reporters that have traveled to the hydrothermal area with Mr. Bumpass in 1865. Write a story about that experience.

ASSESSMENT: (1) Have students draw a color picture of the thermal area with the appropriate colors and features. (2) Using the information from the field trip and class activity have the students write a story about the hydrothermal area and the processes that formed the soil colors. (3) Share student experiences at the park's hydrothermal area with another class or parents. (4) Have students write down the rules for visiting the hydrothermal areas and the reasons for the rules. (5) Ask the students to list reasons why it is important to “protect and preserve” National Parks. (5) Develop student questions based on the Field Study Pages and Color Key Fact Sheet.

Color Key Fact Sheet

Read the information below on how the colors were formed at the hydrothermal areas and select the appropriate answer. Copy the correct answer onto your Field Study Page. Add any additional notes and observations from your visit.

YELLOW

The yellow color and crystals are formed from sulfur dioxide gases escaping into the air from a fumarole or vent. As the gas escapes, it leaves behind a deposit of pyramid-shaped sulfur crystals or stains. The rotten egg smell is hydrogen sulfide gas.

WHITE

The soft, white powdery soil is what is left of volcanic rock after it has been completely broken down by sulfuric acids and steam. It is made up of silica and kaolinite minerals.

BLACK OR GRAY

The black and gray colored soils are volcanic rock that has not yet been completely broken down by the sulfuric acid and steam. This results in gray colored clay minerals or black and brown iron mineral compounds. These minerals are spattered out and deposited on the surface near a vent. The black scum on the surface of some of the pools is pyrite an iron-sulfide mineral better known as "Fools Gold."

RED, TAN or BROWN

The ground was stained by red, brown or tan iron-rich mineral compounds that are in the water and steam of the boiling pools and fumaroles. Various chemical reactions with the lava rock in the hot waters of the pools cause the escaping gases to be full of these iron-rich minerals. When the gases escape into the air, some of the mineral compounds they contain are deposited on the ground.

GRAY-COLORED WATER AND MUD

This is was once solid rock. Heat, water, gases, and time along with sulfuric acids have altered the volcanic rock and turned it into clay.

YELLOWISH -ORANGE

The yellow-orange material that covers the ground is sulfate minerals. Sulfate-rich water evaporates at the surface, leaving the colorful sulfate mineral deposits behind.

GREEN

The green color is a plant called alga that grows in the cooler parts of the hot springs, on rocks, in the streams, or on the edges of the hot pools. Other microorganisms including bacteria also live in the hydrothermal features.

Lassen Volcanic National Park Hydrothermal Area Field Study Page

Name _____ Date _____

Location _____

Read the description of each feature; find at least one example of each. Write down the colors you see at each feature. Look for the colors of mud, soil, water, and stains on the ground. Make additional notes on the back. Do not write in the “How were the colors formed?” column; this will be done later using the color key fact sheet.

| Hydrothermal Feature | Colors I observed | How were the colors formed? |
|---|-------------------|-----------------------------|
| BOILING SPRINGS Bubbling pools of water with rising steam, often smelly. | | |
| MUDPOT A pool of boiling mud. | | |
| FUMAROLE A volcanic vent with gases hissing out; may be smelly. | | |
| DRY BARREN COLOR STAINED GROUND The ground in and around the hydrothermal area. | | |
| RUN-OFF STREAMS Hot or cool streams flowing away from thermal features. | | |

THE BIG STORY - LASSEN PEAK ERUPTS

SUMMARY: While visiting the Hot Rock and Devastated Area in Lassen Volcanic National Park, students will "meet" historical figures who witnessed the volcanic events that occurred in May 1915. Students will listen to firsthand accounts and examine historical photos. Students will act as newspaper reporters, recording information and writing a newspaper article.

GOAL: To introduce students to the impacts of Lassen Peak's eruptions, mudflows, and pyroclastic blasts of May 1915 on the lives of local residents and the surrounding landscape

OBJECTIVES: Students will be able to (1) name at least two people that were affected by the volcanic events of May 1915 and (2) write a short newspaper article describing the events as witnessed by those individuals interviewed.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: One to two hours

LOCATION: The first stop is at Hot Rock along the park road. The second stop is at the Devastated Area; students will then walk the Devastated Area interpretive trail.

MATERIALS: Reporter Question Sheets (one per student), pencils, paper, writing boards or cardboard (optional), Photo Pages of five historic photos, Quotes (Loomis's flood account, Wid Hall's story, Stockton Record Reporter's account of Lost Creek, Loomis's account of big eruption, and Frank Houston's story), and a park map (with Hat Creek and Lost Creek highlighted)

SUBJECTS: History, Social Science, Science, Language Art, Drama

KEY WORDS: Volcanic Eruption, Pyroclastic Blast, Mudflow, Devastated

BACKGROUND: Read and share with your class B.F. Loomis's book Eruptions of Lassen Peak. It contains historical information as well as interesting personal accounts, some of which are used in this activity. This book may be purchased from the Lassen Association by mail.

Lassen Peak's eruption sequence follows:

1. From May 1914 through early May 1915, approximately 170 small explosive steam-blast eruptions were recorded. These eruptions ejected only broken fragments of the old rock from Lassen Peak. On May 16, 1915 new hot black lava filled the open crater. During the night of May 18 or the early morning of May 19, large chunks of hot lava spilled over the crater rim and generated an avalanche of hot lava which melted snow on Lassen Peak. The combination of hot lava and melting snow avalanching down Lassen Peak created a debris

flow (often referred to as mudflow). This debris flow or mudflow consisted of melted snow carrying pieces of hot lava, uprooted trees, mud, and rocks down Lost Creek and Hat Creek.

As the mudflow slowed down depositing its debris, it left a flood of muddy water to continue down Hat Creek. This created a flood which washed out homesteaders on Hat Creek.

2. On May 22, 1915 B.F. Loomis and his party hiked to the Devastated Area and took photographs of the debris (mudflow). They ran out of film and left the area. Running out of film might have saved their lives!

3. A few hours after they left the area, the largest eruption occurred sending a pyroclastic flow (a mixture of superheated gases, pumice, and lava fragments traveling at speeds of over sixty miles per hour) down the already devastated area. This hot blast created additional mudflows knocking down and burning any remaining trees.

Note: You will notice that some of the information given by B.F. Loomis does not match the above eruptive sequence. Loomis was thought to be correct at the time, but scientists have clarified the event sequence since then.

INSTRUCTIONAL SEQUENCE:

DAY BEFORE FIELD TRIP TO THE PARK

1. Assign four students to read one of the quotes from the following characters: B.F. Loomis, Wid Hall, Stockton Record Reporter, and Frank Houston. Pass out the quotes to the students so that they can study their "parts." These will be used on the field trip at the appropriate time and place. Tell the students to act out the characters when they read the quotes. This will add more interest and fun to this activity.

2. Pass out Reporter Question Sheets (to all of the students), pencils, paper, and if desired, writing boards. Have students answer questions on separate sheet of paper. These are to be used the day before and the day of the trip. Have your students practice taking notes on the class portion of this activity titled "Editor's Request." This will make it easier for them to answer the questions on their Reporter Question Sheet.

3. Tell the students you want them to pretend to be newspaper reporters from their hometown. The date is May 25, 1915. They are on a field assignment and must write a newspaper article about the recent eruptions of Lassen Peak when they return to class. The day before and on the field trip, reporters will take notes and answer the questions on their Reporter Question Sheets as their investigation proceeds. It is important for everyone to listen very carefully to all that they see and hear. Remember to take good notes.

4. The teacher plays the role of the newspaper editor and reads the following to the students:
EDITOR'S REQUEST: I imagine you've all heard some of the fantastic stories about Lassen Peak's eruptions and perhaps you've seen some of the exciting photographs. I want you to go there, see the devastation firsthand and come back with a detailed report.

Be sure to find out as much information as possible. Apparently, there are some people who had seen and experienced the eruption firsthand. Be sure to interview them. Now, I imagine you are probably a bit worried about traveling to an active volcano, but don't forget, if you want to produce quality news reporting, you've got to get close to the action. Besides, I checked it out; you'll be safe.

Our newspaper staff has already gathered the following information. On the night of May 18, or in the early morning of May 19, residents in Hat Creek experienced a huge flood. There was lots of muddy water and some debris which swept rapidly down stream. Some think it might have come from Lassen Peak.

When Loomis went up to investigate, he found a huge area completely devastated. All the trees and topsoil had been swept away from Lassen Peak. Along the edge of the flow where some of the trees were still standing, high water had stripped the bark off to a height of eighteen feet. On May 22, the largest eruption yet was witnessed by hundreds of people. A huge mushroom shaped cloud formed over Lassen and was estimated to be 30,000 feet high.

Have the students now answer Question No. 1 on the Reporter Question Sheet.

DAY OF FIELD TRIP

1. Buses coming into the north entrance of the park should stop at the Loomis Museum or get a drink of water, and if desired, have a snack. Then proceed to Hot Rock.
2. Unload the students at the Hot Rock pullout along the park road. Gather the class away from the Hot Rock. Using a park map, orient the students to Lassen Peak, Hot Rock, the Devastated Area, and Hat Creek which flows out of Hat Lake. Explain that Lost Creek is located a short distance behind the Hot Rock.
3. After orienting the class, take them over to the Hot Rock. Introduce them to "B.F. Loomis." Remember the date is May 25, 1915. Have the student who has volunteered to be B.F. Loomis read the following with as much flair as he or she can muster up:

LOOMIS'S FLOOD ACCOUNT:

"We reached the head of Lost Creek about noon, where we found that about all the water had come from the crater in Lassen Peak, which ran down the mountain side like a river. There was a great slit in the rocks on the east side of the peak where the water came from mostly, and all the water ran down on the Lost Creek side. The land on the hillside was well covered with timber before the flood, but the flood carried everything before it and not a tree was left in the path of the flood where it came down the mountain side, and for a long way down the creek. This flood was from a few feet up to eighteen feet deep...as was evidenced by the mud on the trees, and also by the bark which was peeled off, and the trunks of the trees were battered up to that height by the floating debris, logs, trees, and stones as they went flying past. Apparently, about half of the water swirled around and went down Lost Creek, and the other half went down Hat Creek."

“It is no exaggeration to say that the volume of water and mud in the two creeks must have been equal to that carried in the Sacramento River opposite Anderson at flood tide or high water mark. At the lower end of the Adams' place on Lost Creek the valley is about two hundred yards wide and the mud on the trees showed that the mudflow was about twelve feet deep. All the meadow lands on both creeks are covered with rocks and debris, rendering them worthless, and none of the buildings or fences remain. Many large rocks, some of them hot, were thrown from the crater or torn off the lip of the crater on the west side, and carried down the creek by the raging torrents. The largest hot rock we saw was...about 18 feet wide, 20 feet long and I estimated it to be about 14 feet thick. It was carried four or five miles from the crater of Lassen Peak to where it now lies. And after forty hours from the time it left the crater it was still sizzling in the water. Only the largest trees were left standing in the track of the flood, and most of those had the bark peeled off up to high water mark on the side where it came in contact with the floating debris, logs, and trees.”

Show the students the Loomis photo "Hot Rock on Lost Creek" (Fig. 24 in Eruptions of Lassen Peak, Photo No. 1.)

LOOMIS'S FLOOD ACCOUNT: The Jessen place was once a fertile meadow, but now it is a waste of land, with not a vestige of buildings or fences to show where the place used to be.

Show the students the photographs of the Jessen meadow before and after the mudflow and flood (Fig. 38 and 39 Eruptions of Lassen Peak, Photos No. 2 and 3.)

4. Have the students finish their notes on their questionnaire. Give them a couple of minutes to examine the Hot Rock.

5. Students get back on the bus and unload at the Devastated Area. **IMPORTANT:** The Devastated Area trail is used by many people. To make sure your class has no negative impact on this area, it is essential that every student stay on the established trail. This will also promote student safety. Remind the students to continue to take good notes.

6. Gather the students by the large sign in the parking area explaining the eruption history. Read the sign out loud together as a class.

7. Walk students to a spot in the Devastated Area that gives them all a good view of Lassen Peak. Have the class sit down and face Lassen Peak. Tell them Hat Creek is directly behind them. Introduce them to Wid Hall, a homesteader who lives ten miles downstream in the Hat Creek Valley. Have the student who has volunteered to be Wid Hall read the following firsthand account of the flood with gusto. Remember, the story takes place ten miles downstream from where the students are sitting.

WID HALL'S STORY: Mr. Elmer Sorahan was a homesteader living in a tent about a mile and a half above here on Hat Creek. In the night his dog barked, raved, and stuck his paws against him in the bed to wake him up. Elmer thought it might be some kind of animal, a bear, or panther, so he got up and dressed, put on his high top boots and laced them up. He put his gun by the bed, then peeped out to see what the dog was barking at. He saw the mudflow coming like a wave about twelve feet high with what looked like a white streak on top. The flood made a roar something like a gale of wind in

the trees, with a crash and boom of the logs and rocks as they came tumbling along in the flood. He realized that it must be a flood coming, so without waiting for his gun, he left everything and ran down the creek to awaken those who lived below him on the creek.

It was about eleven or twelve o'clock when the flood reached our place. Elmer came with a rush, and he was perhaps five minutes ahead of the wave that struck our house. He gave a yell that startled us, and we all jumped up in a hurry. Frank Bartlett happened to be staying there that night but he was sleeping in the barn across the creek, 150 yards distant. Elmer then ran across the creek to awaken him, and just got back across the creek when the bridge went out. Frank remained on the other side. As soon as Elmer returned he took the two girls, one by each hand, and beat it for higher ground. The older girl, Marian, was fairly well dressed, but the younger one was too slow and had no shoes on, and in their haste she stubbed a toe nail off. The crash and roar of the flood was so intense that you could hardly hear one yell even at a short distance. About three o'clock we tried to get back to the house which had moved 53 feet and lodged against a tree and the yard fence, but could not reach it at that time...

8. Have students finish notes on what happened at Wid Hall's place.

9. Take the class as a group around the Devastated Area interpretive trail. Stop to read the signs along the way. Students can take notes and fill in information on their Reporter Question Sheets as they go. Make it clear to all students that they are to stay on the trail and not disturb anything along the trail. Note: If you have a large class you may wish to break them into two or more groups to walk the trail. This would require that the students reading the quotes be stationed at their appropriate stop and share their story and photos with the student groups as they pass by.

10. Stop at the Giant Boulder sign and introduce the reporters from the Stockton Record. The Reporter is excited about a story he/she just heard and are generous enough to share it with you. Have the student who volunteered to be the Stockton Reporter read the following:

STOCKTON RECORD REPORTER ACCOUNT OF LOST CAMP

We hit Lost Creek at Lost Camp, or rather where Lost Camp used to be.

Now it is truly lost. Lost Camp was the mountain range used by A.J. Herbert. Fortunately, owing to the lateness of the season (there was still too much snow), he had not moved in for the summer, else he might not have been so fortunate as the family of Wid Hall, ten miles farther down from the peak. We found parts of Herbert's house jammed in between two big pines in the middle of a big pond of hardening mud two hundred yards below the spot where it formerly stood.

TEACHER adds: "Herbert was a stockman who used this area for summer grazing. Not any more!"

11. At the Hot Blast sign, stop and read the interpretive sign. Ask the students if you were standing here on May 22, 1915 at 4:00 p.m., would you have survived the eruption?

12. Stop the class at the Loomis Hot Rock sign. The students see Mr.Loomis again who now shares a little about the eruption on the afternoon of May 22 and shows them the Hot Rock

photograph taken by Loomis the morning of May 22, 1915 (Fig. 22, Eruptions of Lassen Peak, Photo No. 4.) Loomis reads:

LOOMIS'S ACCOUNT OF BIG ERUPTION

On our way home that evening when we reached the Manzanita Chute...we witnessed the largest eruption of Lassen Peak which ever occurred. The eruption came on gradually at first, getting larger and larger until finally it broke out in a roar like thunder. The smoke cloud was hurled with tremendous velocity many miles high, and the rocks thrown from the crater were seen to fly way below the timberline before they were followed by a comet-like tail of smoke which enabled us to tell definitely the path of their flight. For a short time the smoke cloud ran down the mountain side, melting the snow very fast, and the water could be seen running down the mountain side in a rush twenty feet wide. But soon after the cloud lifted going straight up so the amount of water running down our direction was slight.

Show the students the photograph of the Big Mushroom Cloud (Fig. 32, Eruptions of Lassen Peak, Photo No. 5.)

13. Have the students finish taking notes on Loomis's story.

14. Stop at the Rock and Roll exhibit sign and introduce Frank Houston. Have the student who has volunteered to be Houston read the following:

FRANK HOUSTON'S STORY:

At the time of the big blowout, on May 22, 1915, I was running a little mill on Hat Creek, about thirty miles north of Mt. Lassen. There came a flood on the twenty-first of May but it was cloudy and stormy so we could not see the mountain. So, four of us, George Hector, Frank Burnell, Roy Houston, and myself, went up the creek to see what the trouble was.

We went to Big Springs that day, where we stayed over night. The next day we crossed Lost Creek and the water was not over four inches deep. But after following up the creek for half a mile we could not go any further with the team on account of the mud that had come down in the flood, so we left the team there and went the balance of the way on foot. We had gone about a mile when the big blowout came on. We stood where we were watching the eruption until we heard the flood coming, and we had to cross the creek to get home, so we started on a run for the team about two miles further down the creek. We then had to drive to Twin Bridges to cross, but when we got there, the flood had beat us, and we could not cross.

We waited for the water to go down, and we had to stay there until about nine o'clock the next morning, and then the water was up to the horses' sides and to the bed of the wagon. Then we went down to Big Springs and got our breakfast, the first we had eaten since the morning before.

Mrs. Bramhall was there and wanted me to take her out, so we packed up her things and went over to Logan Lake, and there we met Wid Hall and family. They said the flood had wrecked their house and barn, so we went down there to see what we could save, but we couldn't get anything, the mud was too deep. So we came back and stayed at Logan Lake that night, and went home the next day.

15. Have the students finish notes on Frank Houston's story.
16. Have the students finish walking the Devastated Area trail and read the rest of the display signs to obtain additional information for their articles if there is time.
17. Gather the class together back in the parking area. Review the information they have heard and noted. Have student reporters share their information with other student reporters. Have the students finalize their notes. This is the end of the activity.

Note to teacher: If you run out of time have the students share their information back in class.

EXTENSION/ENRICHMENT:

(1) The events of May 1915 were similar to the events of Mount St. Helen's eruptions. Read articles about the Mount St. Helen events and compare them to the Lassen events. How were the events the same? How were they different? Why was there such a big difference in the amount of lives lost? (2) Find newspaper articles, books, etc. showing and telling about Lassen's eruptions. (3) Did the eruptions have any affect on the town you live in? If so, what? (4) The location where people settle might mean the difference between life or death. Look at topographical maps of Lassen. Where do you think the affected homesteaders lived? Were all their neighbors equally at risk? Why or why not? (5) What natural disasters could happen in your home area? Can you tell who might be affected and who probably wouldn't? Do you think predictions would always be correct? Are there places you would definitely not build a house? (6) Find out as much as you can about your town in 1915. Read old newspaper articles, look at old pictures, get old timers to come and talk to your class. What was different? What is the same?

ASSESSMENT: (1) Have the students give an oral presentation describing the events or scenes of the eruption as reported by the eye witness accounts. (2) Have the students turn in their Reporter Question Sheets, written articles, and notes. (3) Have the students write a short article about the recent volcanic activity as seen by one of the people they have "met." (4) Have the students compare the historical accounts of May 1915 with their impressions of the area as it looks today.

REPORTERS QUESTION SHEET

1. What have you already heard?

What happened on May 18 and 19?

What did Loomis find?

What happened on May 22?

2. Who did you talk to at the Hot Rock?

Where did he think the water came from?

How deep was the mudflow?

What happened to the trees?

What happened to the Adams' place?

How did the Hot Rock get here?

What happened to Jessen Meadow?

Could it still be used as summer pasture?

3. Who woke Elmer Sorahan up in his tent on Hat Creek?

What did he do when he realized a flood was upon him?

Write notes about what happened at Wid Hall's place.

4. What happened to A.J. Herbert's house and property?

Will he be moving up to graze his animals this summer?

5. If you were standing in the Devastated Area on May 22, 1915 at 4:00 p.m., would you have survived the eruption?

6. Write notes on the eruptions Loomis witnessed on the afternoon of May 22.

Why did he leave the Devastated Area?

Were any lives lost? Why or why not?

7. Write notes from Frank Houston's story.

8. What other information about Lassen Peak's eruption have you learned from walking the Devastated Area interpretive trail?

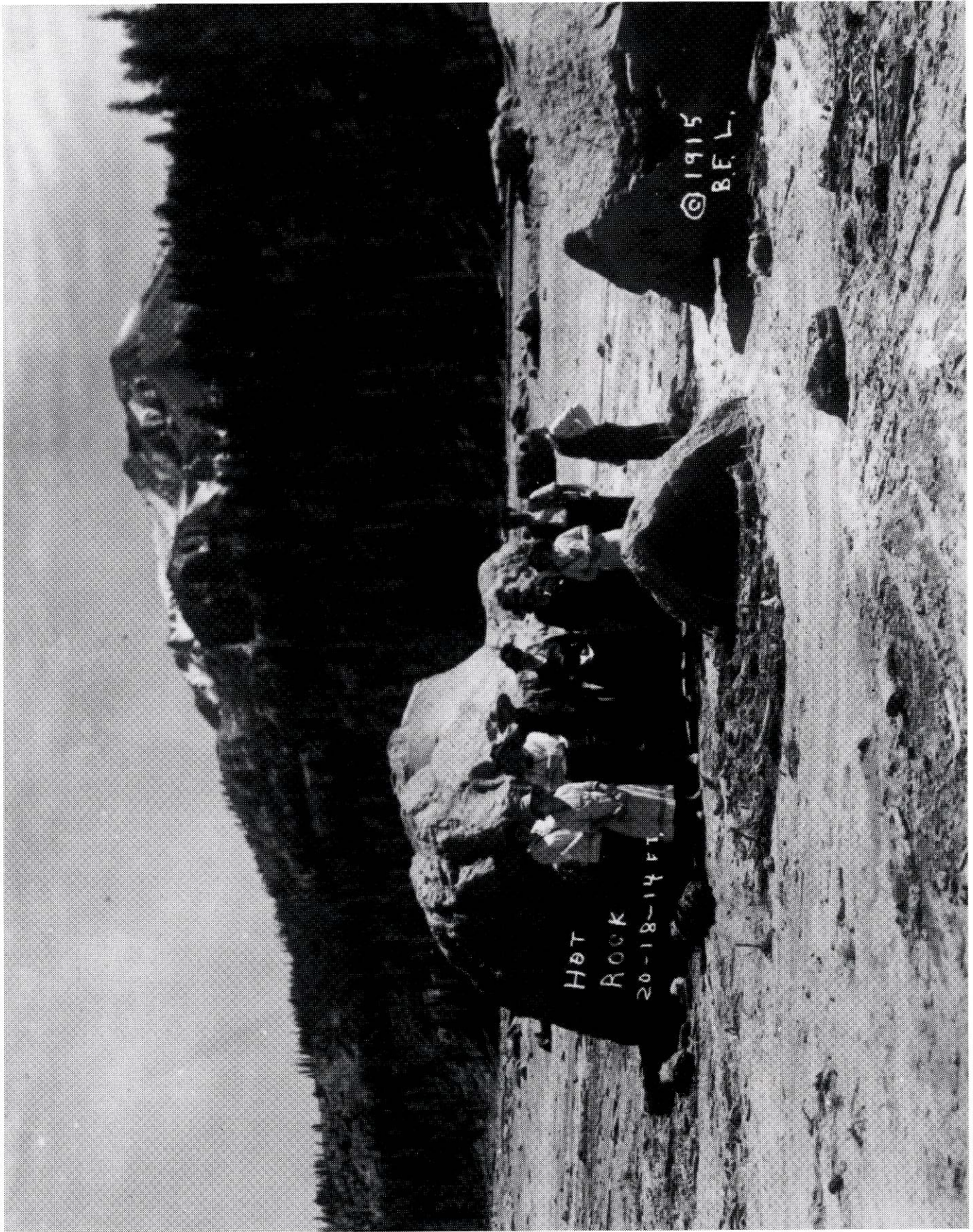


PHOTO 1 - HOT ROCK ON LOST CREEK



PHOTO 2 - JESSEN MEADOW BEFORE 1915 ERUPTION MUDEFLOW



PHOTO 3 - JESSEN MEADOW AFTER ERUPTION AND MUDFLOW

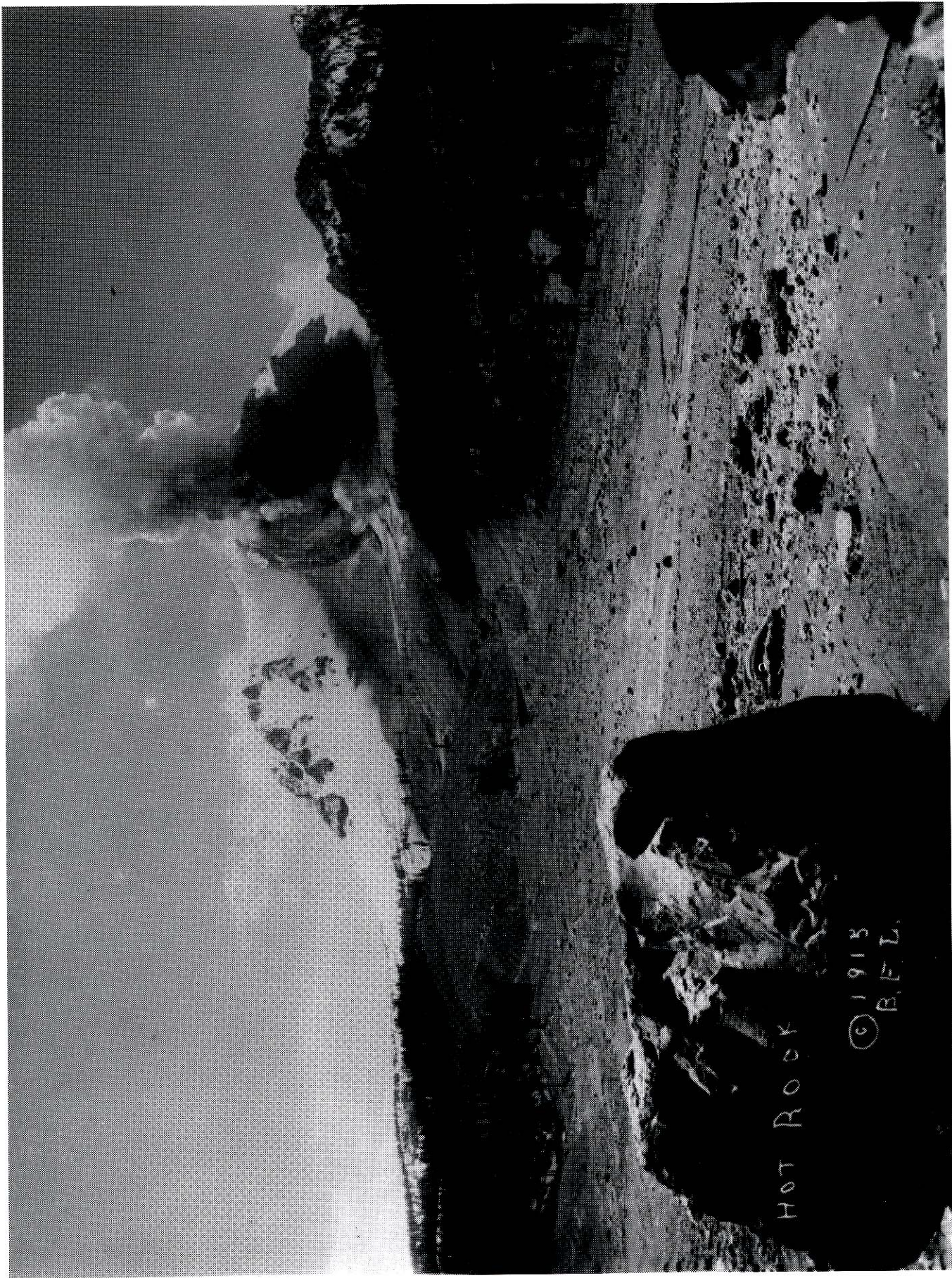


PHOTO 4 - HOT ROCK

ERUPTIVE HISTORY OF LASSEN VOLCANIC NATIONAL PARK CREATING A TIMELINE

SUMMARY: In this activity students will become familiar with the eruptive history of Lassen Volcanic National Park by reading a story and then developing a timeline of the park's volcanic history.

GOAL: To increase student awareness of the volcanic history of the park.

OBJECTIVES: By the end of the activity, students will be able to develop a brief, but accurate timeline of Lassen Volcanic National Park's eruptive history.

GRADE LEVEL: Fourth, through Twelfth

TIME REQUIRED: 45 to 60 minutes

SETTING: Classroom

MATERIALS: Each student will need a copy of the handouts "Eruptive History of Lassen Volcanic National Park: Creating a Timeline" Before and After Lassen Peaks 1914 Eruption, twelve 2" x 4¼" strips of white art paper, glue sticks, colored pens and pencils and/or crayons, and two pieces of 8½"x14" plain white paper.

INSTRUCTIONAL SEQUENCE: Introduce the activity by explaining that each student will read the handouts about the eruptive history of Lassen Volcanic National Park. Explain that they will be responsible for looking for key pieces of information that will be used in the development of two timelines, one for before and another for after Lassen Peak's 1914 eruption. Show the students the strips of art paper and explain that they will be writing their timeline information on them. It is suggested that you create one or two sample timelines to help the younger students understand the concept of a timeline.

Give copies of the handouts "Eruptive History of Lassen Volcanic National Park: Creating a Timeline" Before and After Lassen Peaks 1914 Eruption to each student. Have each student read the stories. The students need to look for key dates and information that will help them develop two accurate timelines. Each timeline strip must contain text that depicts the information they gathered from the reading. Use six strips for each timeline. Students glue finished timeline strips to the 8½"x14" white paper. Students may color and draw pictures above each timeline strip.

EVALUATION/ASSESSMENT: Evaluate by using the **Reporting of Information Rubric**. Also use the “Eruptive History of Lassen Volcanic National Park: A Chronological Timeline” included at the end of this activity as an aid in evaluating the student work.

Reporting of Information Rubric

The primary focuses are attention to detail and accurate reporting of information related to the eruptive history of Lassen Volcanic National Park.

- 4 Timelines demonstrate an in-depth understanding of historical eruptive events that occurred in Lassen Volcanic National Park. Eruptive events featured are in the correct chronological order and are described accurately.
- 3 Timelines demonstrate an acceptable understanding of historical events that occurred in Lassen Volcanic National Park. Eruptive events are featured in the correct chronological order. The written descriptions lack detail but are accurate.
- 2 Timelines demonstrate limited understanding of the historical events that occurred in Lassen Volcanic National Park. Eruptive events are featured, but one or more of the events may be out of chronological order. The written descriptions may lack detail and may not be accurate.
- 1 Timelines demonstrate extremely limited understanding of the historical events that occurred in Lassen Volcanic National Park. Eruptive events may be featured, but they are out of chronological order and may lack organization. The descriptions are poorly written.

Eruptive History of Lassen Volcanic National Park Creating a Timeline Before Lassen Peak's 1914 Eruption

Lassen Volcanic National Park has a long history of volcanoes and volcanic eruptions. Many people think of Lassen Peak as “The Volcano” of Lassen Volcanic National Park when in fact every mountain in the Park is a volcano or part of a volcano. Lassen Peak is just one of many volcanoes that occupy the area designated as Lassen Volcanic National Park.

Between 600,000 and 470,000 years ago a large composite or stratocone volcano called Mount Tehama formed in the southwest portion of what is the Park today. It towered over the area for many centuries. It slowly went extinct and eroded away into its present form with Brokeoff Mountain, Mount Diller, Mount Conard, and Pilot Pinnacle left as reminders of this once great volcano of the past. The Sulphur Works hydrothermal area is where the central vent of old Mount Tehama is thought to have been.

After the extinction of Mount Tehama, a number of lava dome volcanoes (sometimes called plug domes) began to erupt northeast of Mount Tehama between 300,000 and 200,000 years ago. These lava dome volcanoes are familiar landmarks in the Park. They include Ski Heil Peak (244,000 years ago), Bumpass Mountain (about 232,000 years ago), and Reading Peak (approximately 212,000 years ago). Other volcanoes including shield, cinder cone, and more lava domes erupted during the past 100,000 years to form the remainder of the volcanoes found in the Park. Two of these include Eagle Peak (66,000 years ago) and Hat Mountain (40,000 years ago).

Lassen Peak was formed 27,000 years ago. It probably took only a few years to reach its present height. With a height of 2,000 feet from its base and a volume of half a cubic mile, it is one of the largest lava domes on Earth. When Lassen Peak formed, it was probably very steep-sided and covered with rock talus. However, from 25,000 to 18,000 years ago during the last ice age, glaciers altered Lassen's shape. The glacial erosion gouged a bowl-shaped depression on the volcano's northeast flank, called a cirque.

Approximately 1,100 years ago six lava dome volcanoes collectively known as the Chaos Crags Volcanoes were formed in a series of violent eruptions north of Lassen Peak near Manzanita Lake. The volcano called “Cinder Cone” with its Fantastic Lava Beds and Painted Dunes formed in a series of eruptions about 350 years ago. This spectacular volcano is located near Butte Lake in the northeastern part of Lassen Volcanic National Park

Eruptive History of Lassen Volcanic National Park Creating a Timeline After Lassen Peak's 1914 Eruption

On May 30, 1914 Lassen Peak awoke from its 27,000 year-long sleep when it was shaken by a steam explosion. By mid-May 1915 more than 180 steam explosions had blasted out a 1,000 foot-wide crater near the summit of Lassen Peak. Steam explosions or steam blasts occur when molten rock (magma) rises toward the surface of a volcano and heats shallow ground water. The hot water rises under pressure through cracks and on nearing the surface, vaporizes and creates steam explosions.

On the evening of May 14, 1915 blocks of hot lava could be seen bouncing down the flanks of Lassen from as far away as the town of Manton, 20 miles to the west. Between May 14 and May 19 a new lava dome formed in the crater. Late in the evening of May 19, a large eruption shattered the new lava dome sending large blocks of hot lava avalanching down the northeast flank of Lassen. This hot lava melted the large snow pack on the side of Lassen generating a mudflow of volcanic materials, called a lahar, down Lost Creek and Hat Creek. Also during the night of May 19-20, dacite lava erupted filling the new crater of Lassen, spilled over the low spots on its rim, and flowed 1,000 feet down the steep west and northeast flanks of the volcano.

Late in the afternoon of May 22, 1915 after two quiet days, Lassen Peak exploded in a powerful eruption that blasted rock fragments and pumice high into the air, creating the larger and deeper of the two craters seen near the summit of the volcano today. A huge column of volcanic ash and gas rose more than 30,000 feet into the air and was visible from as far away as Eureka, 150 miles to the west. The eruption generated a high-speed avalanche of hot ash, pumice, rock fragments, and gas, called a pyroclastic flow that swept down the side of the volcano, devastating a three square mile area. This pyroclastic flow also created a new lahar of melted snow and volcanic rock pieces that rushed down Lost Creek and Hat Creek. The May 22 eruption also generated additional smaller mudflows on all flanks of Lassen Peak.

For several years after the May 22, 1915 eruption, spring snow melt percolating down into Lassen Peak triggered steam explosions, indicating that rocks beneath the volcano's surface remained hot. Steam explosions in May 1917 blasted out the second of the two craters now seen near the volcano's summit. Steam vents could be found in the area of these craters into the 1950s but gradually died out. Today Lassen Peak sleeps again, but active steam vents, boiling springs, and bubbling pools of hot mud are still found elsewhere in Lassen Volcanic National Park. No one can say when, but it is almost certain that the Lassen area will experience volcanic eruptions again.

Eruptive History of Lassen Volcanic National Park A Chronological Timeline

The eruptive history of Lassen Volcanic National Park is listed below in chronological order.

- Between 600,000 and 470,000 years ago a large composite or stratocone volcano called Mount Tehama formed in the southwest portion of what is Lassen Volcanic National Park today.
- After the extinction of Mount Tehama, a number of lava dome (sometimes called plug dome) volcanoes began to erupt to the northeast of Mount Tehama between 300,000 and 200,000 years ago. These included Ski Heil Peak (244,000 years ago), Reading Peak (212,000 years ago), and Bumpass Mountain (232,000 years ago).
- Other volcanoes including shield, cinder cone, and more lava domes, erupted during the past 100,000 years to form the remainder of the volcanoes found in the Park. Two of these include Eagle Peak (66,000 years ago) and Hat Mountain (40,000 years ago).
- Eruptions about 27,000 years ago formed Lassen Peak, probably within only a few years.
- The Chaos Crags Volcanoes formed about 1,100 years ago.
- Cinder Cone with its Fantastic Lava Beds and Painted Dunes formed approximately 350 years ago.

Lassen Peak History, 1914 to Present

- On May 30, 1914 Lassen Peak awoke from its 27,000 year-long sleep when it was shaken by a steam explosion.
- By mid-May 1915, more than 180 steam explosions had blasted out a 1,000 foot-wide crater near the summit of Lassen Peak.
- On the evening of May 14, 1915 blocks of hot lava could be seen bouncing down the flanks of Lassen from as far away as the town of Manton, 20 miles to the west.
- Between May 14 and May 19, 1915 a lava dome formed in the crater.
- Late in the evening of May 19, 1915 a large eruption shattered the new lava dome in the crater sending large blocks of hot lava avalanching down the northeast flank of Lassen. This hot lava melted the large snow pack on the side of Lassen generating a mudflow of volcanic materials, called a lahar, down Lost Creek and Hat Creek.
- During the night of May 19-20, 1915 dacite lava, somewhat more fluid than the lava dome, filled the new crater of Lassen, spilled over the low spots on its rim, and flowed 1,000 feet down the steep west and northeast flanks of the volcano.
- Late in the afternoon of May 22, 1915 after two quiet days, Lassen Peak exploded in a powerful eruption that blasted rock fragments and pumice high into the air, creating the larger and deeper of the two craters seen near the summit of the volcano today. A huge column of volcanic ash and gas rose more than 30,000 feet into the air and was visible from as far away as Eureka, 150 miles to the west. The eruption generated a high-speed avalanche of hot ash, pumice, rock fragments, and gas, called a pyroclastic flow that swept down the side of the volcano, devastating a three square mile area. This pyroclastic flow also created a new lahar of melted snow and volcanic rock pieces that rushed down Lost Creek and Hat Creek.
- For several years after the May 22, 1915 eruption, spring snow melt percolating down into Lassen Peak triggered steam explosions, indicating that rocks beneath the volcano's surface remained hot.
- Steam explosions in May 1917 blasted out the second of the two craters now seen near the volcano's summit.
- Steam vents could be found in the area of these craters into the 1950s but gradually died out.
- Today Lassen Peak sleeps again, but active steam vents, boiling springs, and bubbling pools of hot mud are still found elsewhere in Lassen Volcanic National Park.

EXPLORING THE GEOLOGY OF LASSEN VOLCANIC NATIONAL PARK THROUGH THE INTERNET

SUMMARY: Students will use the Internet to find sites that have geologic information about Lassen Volcanic National Park.

GOAL: Students will become familiar with the different types of geologic features found in Lassen Volcanic National Park.

OBJECTIVES: By the end of the activity, students will be able to identify and describe at least two geologic features found within the boundaries of Lassen Volcanic National Park.

GRADE LEVEL: Fourth through Twelfth.

TIME REQUIRED: 30 to 45 minutes

SETTING: A classroom setting or computer lab with one or more computers is appropriate for this activity.

MATERIALS: Each student needs one record sheet. Teams of two students can be assigned to one computer.

INSTRUCTIONAL SEQUENCE: Assign this activity as a center for stations or as an individual assignment in a computer lab. Give a brief overview of the expected outcome. (Two students could share a computer and investigate at least one Lassen Volcanic National Park Internet site. Each student will be expected to research the site and find information related to the geology of Lassen Volcanic National Park.) If the activity is assigned as part of a computer lab lesson adjust your instruction to meet your needs.

EXTENSION ACTIVITIES: (1) Have students develop a poster that advertises the Internet site they visit. Students must include a minimum of one geologic fact that they discovered while researching the site. (2) Create a student directory of Internet sites that have information about Lassen Volcanic National Park. Have students write a brief summary about the site. Students can develop a rating system for the sites based on the amount of geologic information found at each site.

EVALUATION/ASSESSMENT: Use the attached rubric to evaluate the students' work.

Name _____

Lassen Volcanic National Park Geology Internet Search

Directions: Select one of the following Internet sites and look for information about the geology of Lassen Volcanic National Park. You may also use a search engine and type in Lassen Volcanic National Park and find a site of your own. Answer the questions listed below. Use a sheet of paper if more space is needed.

Possible Internet Sites:

http://vulcan.wr.usgs.gov/Volcanoes/Cascades/ImageMaps/CascadeRange/cascade_range.html

<http://vulcan.wr.usgs.gov/Outreach/AboutVolcanoes/framework.html>

<http://vulcan.wr.usgs.gov/Volcanoes/Lassen/framework.html>

http://vulcan.wr.usgs.gov/Volcanoes/Lassen/description_lassen.html

<http://vulcan.wr.usgs.gov/Glossary/Domes/framework.html>

<http://www.usgs.gov/education>

<http://www.nps.gov/lavo>

<http://quake.wr.usgs.gov/index.html>

1. Which site did you visit?

2. What does the site describe about the geologic features of Lassen Volcanic National Park? Write a four to five sentence summary.

3. Name at least two geologic features described at the site and write a short two to three sentence description of each feature. Include any interesting facts you learned about each feature.

4. Write a three to five sentence description about any other interesting fact or additional information that you learned about Lassen Volcanic National Park while reading the site.

Scoring Rubric

- 4 The student team or individual successfully located an Internet site without any teacher assistance. Detailed information about the geology of Lassen Volcanic National Park was recorded.
- 3 The student team or individual successfully located an Internet site without any teacher assistance. Information about the geology of Lassen Volcanic National Park was recorded.
- 2 The student team or individual needed teacher assistance in locating an Internet site. Information about the geology of Lassen Volcanic National Park was recorded, but it was brief or not appropriate.
- 1 The student team or individual was not successful in locating an Internet site or needed much assistance in locating a site. Information about the geology of Lassen Volcanic National Park was brief or sketchy and may have been missing altogether. However, the team or individual was focused and on-task the entire time.
- 0 The student team or individual was not on-task. The assignment was not completed.

Notes and Observations

INDIAN ACORN GAME

SUMMARY: Students will hear a story about the Atsugewi Indian use of acorns, learn how to make an acorn top, and play an Atsugewi children's game.

GOAL: For students to learn about the importance of acorns in the lives of the Atsugewi Indian people

OBJECTIVES: Students will be able to (1) name three uses of acorns by the Atsugewi, (2) describe how and when acorns were gathered, and (3) make an acorn top and play a game with it.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: Two 45 to 60 minute periods

LOCATION: Classroom

MATERIALS: Acorns, small sticks about the size of a matchstick, and sharp stones to drill holes in the acorns

SUBJECTS: CA History/Social Science, Language Arts, Science

KEY WORDS: Atsugewi (Aht-zsu-GAY-wee), Acorn, Food Source

BACKGROUND: The Atsugewi Indian tribe (also called the Hat Creek Indians) lived on lands northeast of Lassen Volcanic National Park. Their summer territory included the Manzanita Lake area and much of the northern part of the park. Today, many of the Atsugewi live near the small community of Hat Creek. Acorns were an important food source. They were gathered in the fall when the leaves were changing colors. The Atsugewi people preferred acorns from California Black Oak (*Quercus kelloggi*). The Black Oak is a common species found in lower elevation mountain areas. The acorns from Black Oaks can be stored up to seven years after being dried. Acorns were carefully examined for small holes caused by insects. Good quality acorns have no holes. The Acorn Game was played by the Atsugewi children when there was free time. This game, acorn identification, and top-making skills were taught to the children by the women in their families. Acorns were used for food, jewelry, and as medicine for an upset stomach.

The information in the Acorn Story is taken from the Anthropological Records, 14:2, Atsugewi Ethnography, by Thomas R. Garth, University of California Press, Berkeley and Los Angeles, 1953. An excellent source of information about the Atsugewi is the book Indians of Lassen by Paul E. Schulz, Lassen Loomis Museum Association, Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Discuss the importance of acorns in the lives of the California Indians. Discuss what life as an Atsugewi Indian might have been like before the pioneers came to California. Read and discuss the Acorn Story. Explain that the students are going to make acorn tops. Atsugewi children made acorn tops as toys and used them when playing the Acorn Game.

Acorns will need to be gathered; it is best if students can do this. The best tops are made with short, round, well-balanced acorns. If you are unable to find a source for Black Oak acorns, most other types of oaks found in the Sacramento Valley and surrounding foothills will do, especially Live Oaks. Students will also need a stick the size of a large kitchen matchstick (you may wish to provide matchsticks with heads broken off) and a small pointed rock for drilling a hole in the acorn.

When you are back in class, spread the acorns on a large flat surface so the students can choose their acorns. Explain that they are now going to make their acorn tops. Show them a completed top and demonstrate how to make one. Make sure the students have all the items they need. It is recommended that they make their tops on the floor of the classroom or outside. They begin by drilling a small hole (one fourth to one-half inch deep) in the top of the acorn for the stick to fit in. The top of the acorn is the rounded end opposite the pointed bottom. The hole should be the same size as the stick so the stick fits tightly into the hole. The small stick is then carefully wedged into the top of the acorn. The pointed end is the spinner part of the top that spins on the ground and the stick extends into the air providing balance.

You may wish to make some extra tops in case some of the student tops break or do not work. When the students have finished their tops, they are ready to play the Acorn Game. Atsugewi children used the thumb and forefinger of one hand to spin their tops. Have the children practice spinning their tops in preparation for the game.

To play the Acorn Game divide the class into small groups of four or five students. Spread the groups out around the classroom floor or outside on the sidewalk or other hard surface. Everyone in the group must start spinning his/her top at the same time. The top that spins the longest is the winner in each group.

EXTENSION/ENRICHMENT: (1) Dry acorns and make acorn flour. Leach the flour and make acorn mush and/or acorn bread. (2) Have an acorn shelling contest. (3) Have the students teach younger students how to make acorn tops.

ASSESSMENT: Have the students answer questions based on the Acorn Story. Student acorn tops can also be used as a product in the assessment process. Have the students make another acorn top at home with a parent, relative, or friend. Have them bring the newly made tops to school.

ACORN STORY

The Atsugewi used many different kinds of foods (meat from game animals and many kinds of plants) because no one source provided enough food to ensure that the people would not go hungry. The Atsugewi cleverly learned about many kinds of food and used a great variety.

Acorns were one of their most important vegetable foods. Men or agile girls climbed oak trees and knocked acorns down with sticks or they stood below and knocked them down with longer sticks. Women gathered the fallen acorns in baskets. Black acorns were preferred over white. If acorns were picked slightly green, they were not as good. Acorns were carried in baskets about as big around as a basketball and as tall as two basketballs piled on top of each other. The baskets were so heavy that they had to be moved in stages to the Atsugewi winter quarters.

Many of the acorns were dried in the shell on slabs of bark and stored in pits or granaries. Shelled acorns were stored in large baskets in the cookhouse or outside covered over with bark. Acorn shelling was a social occasion. Young people had contests to see who could shell ten acorns the fastest. They shelled the acorns with their teeth or by pounding the up-ended acorn with a rock, using another rock as an anvil. One person might do the cracking and another might take the shells off; both boys and girls participated. The split acorns were dried on platforms of branches and pine needles, supported on four posts about three feet high. On rainy days a fire was built underneath to dry the acorns.

Acorns were prepared for eating by being smashed in a basket. The flour was sifted by shaking it on a board or flat basketry tray; the larger pieces were separated out and pounded over again. These one and one-half foot square sifting boards were once made from sections of hollow trees ground to the required thickness with stones. The flour was leached in a basin in the sand (later on in a basket topped with flour sacking); cold water was poured through the meal two or three times and then warm water was poured through until it tasted right. The prepared meal could be stored until needed.

To make acorn mush, acorn flour and water were put into a basket with hot stones that had first been dipped in water to remove the ashes. Two forked sticks were used to lift the hot stones. A plain stick served as a mush stirrer. Mush was ordinarily eaten with meat. Each person had his/her own small basket of meat and mush and ate it by making a spoon with the index and middle fingers. To make acorn bread, some of the meal was mixed with water and a small quantity of earth. It was then molded into small biscuits or larger loaves and wrapped in sunflower leaves. The bread was cooked all night in an earth oven. It might keep a week without spoiling and was often taken by men on hunting expeditions.

ATSUGEWI STICK GAME

SUMMARY: Students learn and play the Atsugewi Stick Game, a guessing game played by Atsugewi children.

GOAL: To enrich student understanding of the lifestyle of the Atsugewi indian tribe.

OBJECTIVES: Students will be able to: (1) Explain three reasons why the Atsugewi traveled to Lassen Volcanic National Park in the summer. (2) play a traditional indian game that was played by adults and children. (3) Describe at least three Atsugewi summer activities.

GRADE LEVEL: Third through Fifth.

TIME REQUIRED: Two 45-60 minute periods.

LOCATION: Classroom and/or Lassen Volcanic National Park

MATERIALS NEEDED: 6 sticks (4 to 6 inches long) per student. One piece of bone for each student(a stick 4 inches long can be marked and used in place of bones).

SUBJECTS COVERED: History/Social Science, Language Arts, Science, Visual and Performing Arts

KEY WORDS: Atsugewi (awt soo gay wee), cooperation

BACKGROUND FOR TEACHERS: The Atsugewi people lived northeast of Lassen Park in the Hat Creek valley. In the summer Atsugewi people often traveled to the higher mountains in what is now Lassen Volcanic National Park. Their objectives were to hunt, fish, trade, gather various plants, and to socialize with other indian tribes or families. Children who made the trip spent time exploring and playing active games with each other. Sometime for reasons of safety or because they needed to not disturb adults involved in trading, they played sedentary games. These were times when they needed to stay close to the adults and entertain themselves. The Stick Game was one game they played during these

times. An excellent source of information about the Atsugewi and other Indians of the Lassen area can be found in the book *Indians of Lassen* by Paul E. Schulz. This book is available at Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Have the class gather the sticks needed for the game (6 per student, about 4 to 6 inches long, plus one extra to be used as a bone. In class prepare the sticks. Have the students peel the bark off all sticks. If you decide to use bones, chicken leg bones work well. All of the sticks should be decorated. The bones should be decorated and marked so players can easily recognize them from their six sticks. Suggested markings might include Indian symbols, nature symbols, etc. After students have prepared their game materials, read aloud to them the information brief titled, *Atsugewi Summer Activities*. Discuss the brief and then have them answer the questions listed below. They may need to have copies of the brief available for reference in order to answer the questions. After the sticks and bones are prepared and the questions answered set aside plenty of time for students to play the game as described on the Stick Game Instruction Page. If you are planning a field trip to Lassen you may wish to have them play the game there.

Questions:

1. List three reasons the Atsugewi traveled to Lassen Volcanic National Park.
2. In what ways did the Atsugewi catch fish?
3. Name at least three ways the Atsugewi hunted.
4. Why do you think gathering plants took so much of the Atsugewi's time?
5. What were some of the reasons the Atsugewi gathered plant materials.
6. What were two social activities of the Atsugewi?

EXTENSION/ENRICHMENT: (1) Have the students make up variations of this game and share it with the class. (2) Have them teach other students or adults how to play the game. Have the students draw a picture of Atsugewi summer activities.

ASSESSMENT: Have the students demonstrate and play the game. Use the student answers from the questions to assess their knowledge of Atsugewi summer activities. Have them write a story based on the information brief.

Atsugewi Summer Activities

In the summer when the snow melted in the high country, Indians from throughout the Lassen region traveled to the cool higher mountain areas to trade, fish, hunt, and vacation in the beautiful land that today makes up Lassen Volcanic National Park. The Atsugewi were among those people. They fished for trout in the mountain lakes, but their fishing was very different from fishing with a rod and reel. They speared fish with two-pointed or four-pointed spears. They trapped fish in basket fish nets and also chased them into pools created by partial rock dams, then scooped them out with baskets and nets. They also used a simple hook or series of hooks attached to a line to catch fish.

They hunted rabbit, fox, deer, squirrels, other small mammals and, occasionally, elk and bear. They hunted in a variety of ways including with bow and arrow, spears, snares, knives, by nooses placed along game trails and by driving game into large pits. The Atsugewi bows and arrows were of very high quality because they had a good supply of yew wood.

Gathering various plant materials for food, blankets, medicine, furnishings, and tools occupied a significant amount of Atsugewi time in Lassen Volcanic National Park. For basket making they gathered maidenhair ferns, bear grass, sedges, pine roots, slender willow ends, and juniper. Plant foods included Manzanita berries, sugar pine nuts, tiger lily, wild onion, serviceberries, elderberries, gooseberries, currants, buckthorn berries, and juniper berries.

Socializing was a very important part of the Atsugewi summer. Games were a fun part of the social activity and were played by people of all ages. Many of the games were guessing games with a large variety of wooden sticks used in various ways. Feasts were perhaps the most important social gathering of the Atsugewi and happened whenever there was an abundance of food. Of course, large feasts were scheduled and planned, usually to commemorate a special event, but a particularly successful hunt resulting in an abundance of meat was reason enough to call for a feast. Trading with other Indian tribes was also an important part of the summer social activity. It was an opportunity to obtain plant materials, tools, and other survival necessities not normally available to them.

Summer as with all the seasons was an important time of year for the Atsugewi. It provided opportunities to accomplish things necessary for survival in a world

intimately connected to the earth.

ATSUGEWI STICK GAME INSTRUCTIONS

This game can be played many different ways. After you learn to play the two games described here, you may want to make up your own game.

GAME 1: 2 PLAYERS

Sit down facing each other and put all sticks except the bones in a pile between you. These become score sticks. Each player takes turns hiding his/her bone in one hand behind his/her back. The other player tries to choose the hand where the bone is hidden. If the correct hand is chosen, the player who guessed correctly takes one stick from the score stick pile and places in front of him/her. If the hand chosen is incorrect, the player hiding the bone takes a stick from the score stick pile and places in front of him/her. Then it's the other player's turn to hide the bone and let the opponent guess which hand holds it. A correct guess earns a scoring stick. An incorrect guess means your opponent gets a scoring stick. When one person has all the scoring sticks, that person wins the game.

GAME 2: 2 PLAYERS PER TEAM, 2 TEAMS

In this game, the two players on one team sit closely together side by side facing the two players on the other team who are also sitting closely together side by side. All (or some agreed upon number depending on how long you want the game to last) scoring sticks are placed in a pile between the two teams. The first team passes the two bones back and forth between each other behind their backs for a set amount of time (10 seconds). At the end of the time, the challengers must guess which team member has the bones. If they guess correctly, they move a scoring stick in front of them. If they guess incorrectly, their opponents move a scoring stick in front of them. Then the other team has to pass and hide the bone until the given time is up and their opponents guess where it is. A correct guess earns a scoring stick. An incorrect guess means your opponents get a scoring stick. When one team has all the scoring sticks, they are the winners.

ATSUGEWI VILLAGE

SUMMARY: In small groups, students will make a model of houses used by the Atsugewi including: earth lodge, bark house, and summer residence.

GOAL: To learn more about the lifestyle of the Atsugewi by building some of the structures of a typical village.

OBJECTIVES: Students will be able to: (1) Describe the three homestyles used by the Atsugewi and for what purposes each type was used. (2) Explain what materials were used in the building of each of the three structures. (3) Demonstrate their knowledge by building a model of an Atsugewi home.

GRADE LEVEL: Third through Fifth.

TIME REQUIRED: two 45-60 minute periods.

LOCATION: Classroom.

MATERIALS NEEDED: Bark, twigs or small sticks (gathered from dead and down material, not live trees), and mud, clay, or other like material to cover the earth lodge surface. Twigs or small sticks must be straight to provide framing for the structures. Large pieces of flat cardboard to make the houses on(2ftx2ftor3ft.x3ft). Size of materials used to make the houses depends on classroom space and size of cardboard.

SUBJECTS COVERED: History/Social Science, Language Arts, Science, Visual and Performing Arts.

KEY WORDS: Atsugewi (awt soo gay wee), earth lodge, bark house, summer residence

BACKGROUND FOR TEACHERS: Background information is contained in the student brief, Atsugewi Houses, which is taken from information contained in the Anthropological Records, 14:2, Atsugewi Ethnography, by Thomas R. Garth, University of California Press, Berkeley and Los Angeles, 1953, and *Indians of Lassen* by Paul E. Schulz. The Indian Ways Nature Trail located at the north entrance to Lassen Volcanic National Park off of State Highway 44. The Indian Ways Nature Trail has life sized examples of all three of these Atsugewi homes.

INSTRUCTIONAL SEQUENCE: Explain to the students that they are going to learn about the Atsugewi's by building a model of their homes and village. Have the students read the student handout, Atsugewi Houses. Have the students answer the following questions. Discuss their answers as a class.

Questions:

1. If you were a wealthy Atsugewi, what kind of a house would you live in during the winter?
2. Who might live with you in your winter home?
3. What kind of a home would you have during the summer?
4. If you were a poor Atsugewi, what kind of house would you live in during the winter? During the summer?
5. Who would help build an earth lodge for a family?
6. Which of the three kinds of Atsugewi houses do you like the most? Why?

After answering the questions, divide the students into groups of 2, 3, or 4 per group. Assign each group a type of Atsugewi home from the three types described in the handout. Or let the students chose which house they would like to build and then divide the class into groups. You may wish to have the students gather the materials needed as a homework assignment and build the houses in another class session. After all the materials needed are gathered, then have each group plan and build their Atsugewi house as described in the handout. Houses could be built outside if space was available. Have each group share their house with the class. Note: If the class is small you may wish to have the students build their own house instead of in groups.

EXTENSION/ENRICHMENT: (1) Research and make other Atsugewi structures. (2) Share your "houses" with other classes. (3) Use your houses to make a display of Atsugewi homes for your school, community, a local museum, or local business that has display space. (4) Have the students make a village with the houses.

ASSESSMENT: Completion of the houses and student answers to the questions provide samples for assessment. Have the students give oral presentations about the lifestyles and environment associated with the houses and the Atsugewi culture.

ATSUGEWI HOUSES

Atsugewi lived in mountain meadows with rivers, streams, and forests surrounding them. It was a land dotted with volcanoes and other volcanic features. The Atsugewi used three main types of housing, earth lodges, bark houses, and simple summer residences. Earth lodges were the most elaborate and substantial buildings. Earth lodges and bark houses were both used for winter homes while branch and brush enclosures to keep wildlife away from food and other belongings were used for summer homes.

Earth lodges were dug into the earth about three feet deep. Large posts formed a frame to support smaller framework. Planks, split logs, and bark were used to cover the frame. The entire structure was covered with a layer of dirt. The roof was covered with a thick layer of grass and dirt. An opening was left in the roof near the strong center support post serving as an entrance and smoke hole. A ladder made of stout logs and rungs tied together with serviceberry withes (thin, flexible branches used to tie things together) was placed through the entrance hole beside the center support post. A heavy mat was placed over this opening or, in really bad weather, a slab of bark was used. A low entrance was placed at the front of the lodge which served as a ventilator shaft and entrance for children. This entrance was closed with a screen of woven willows or tules with grass stuffed behind the screen at night to shut off the drafts. With this limited ventilation, the fire would burn down to coals and keep the lodge warm all night without additional fuel. Friends and relatives helped a family build an earth lodge. The women used digging sticks to excavate the pit while men built the rest of the structure. It often took two or three weeks to build one of these homes. Several families might live in a large earth lodge, each being assigned to their own space. People slept on mats made of tules and used blankets made from deer and elk skin, woven rabbit skins, patchwork rabbit or fox skins, and loose tule or grass.

Bark houses were used as winter houses by poorer people. These were built over pits about 6 inches deep. A square or rectangular wooden frame was built with bark placed on the framework. Dirt was piled high along the base to keep out the cold. A fireplace was located in the center of the floor under a smoke hole in the roof. In the middle of one of the longer sides a doorway was left, which was closed with a tule mat. Another design simply had center supports with logs and bark leaning against them, and dirt piled along the base of the bark walls.

Summer residence was the name given to Atsugewi summer camps. They were circular enclosures of brush, juniper, or other conifer limbs or of rock. They were ten or fifteen feet across with openings to the east. There was no roof, although branches and bark slabs might be put over simple frames in rainy weather.

ATSUGEWI SUMMER CAMP

SUMMARY: Students working in small groups perform various tasks necessary for establishing an Atsugewi summer camp.

GOAL: For students to develop an understanding of the Atsugewi Indian way of life and their use of the environment

OBJECTIVES: Students will be able to (1) describe at least three activities involved in setting up an Atsugewi summer camp, (2) name at least three animals that were hunted and explain how these animals were used, and (3) compare and contrast modern camping needs with those of the Atsugewi.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: 60 minutes

LOCATION: Manzanita Lake or Lily Pond Trail

MATERIALS: Student Activity Page (one per group), pencil, paper (lined and unlined), and a clipboard or something to write on. Optional but useful are local natural history field guides about mammals, birds, tracks, and trees.

SUBJECTS: History/Social Science, Language Arts, Science

KEY WORDS: Atsugewi (Aht-zsu-GAY-wee), Survival

BACKGROUND: The Atsugewi people relied on a broad awareness and understanding of the environment to meet their everyday needs. Since no single resource could sustain their people, they used a variety of resources in their quest to survive. This activity provides the students with an opportunity to make decisions based on their awareness of the environment as a survival skill.

It is best to complete the three Atsugewi activities (Indian Acorn Game, Atsugewi Village, and Stick Game) before visiting the park and doing this activity.

INSTRUCTIONAL SEQUENCE: Prior to your visit, engage students in a discussion about a family camping trip. What will they eat? Where will they get their food? How will they prepare it? What will they use for shelter and for sleeping? What clothes will they take? What camping tools and utensils will they need? What other tools and/or recreational equipment might they bring? List responses on charts and post them around the classroom.

Explain that on the field trip the class will be choosing a summer camp like the Atsugewi did in their summer migration to what is now Lassen Volcanic National Park. Divide the class into Atsugewi family groups of five or six students each. Have groups decide on a name for

their family. Go over the Student Activity Page with the students so they clearly understand what they are to do at the park. Go over simple mapmaking skills since each group will make a map of their site. Make sure students are clear about proper behavior and park rules.

When you arrive at the park, define boundaries and time limits. Distribute the Student Activity Page. Have students proceed on the trail in their assigned family groups.

When the students are back in class, post the camping charts the students generated before the field trip. Develop a similar chart based on student experiences in setting up an Atsugewi summer camp. Record all responses and have the students compare and contrast camping today with Atsugewi summer camping.

EXTENSION/ENRICHMENT: (1) Put the maps made by the groups together in an organized presentation and share it with another class or a community group, and/or set up a display for a classroom, school, or community site so others can learn from your experience. (2) Have the students draw a picture of what their Atsugewi summer camp would look like.

ASSESSMENT: Have each student write a narrative or story describing the establishment of an Atsugewi summer camp. Make sure they include information on fishing, wildlife, and other survival considerations. Maps and field notes should also be incorporated into the assessment of this activity.

STUDENT ACTIVITY PAGE

The class is part of the Atsugewi Tribe that has traveled to this beautiful site to spend the summer. This is a new area that scouts have determined to be "a good place" to camp. You will work together in your family groups and select a summer camp location. As a group you will walk the trail looking for the "perfect" site based on the following needs for survival. . Your group will draw a map of the lake or trail area, noting landmarks and places of importance (for fishing or wildlife sightings). Pick one person in your group to be the mapmaker. Place the location of your summer camp on the map. Make sure the map is clear and readable so other classmates can follow it without your help.

You will need to complete the tasks described below so your summer camp will meet your survival needs. Please read them over before starting out on the trail so you will know what to look for before you begin. Each student must take field notes that relate to the tasks. **All tasks required for this activity must be completed by staying on the trail.**

1. Locating a Summer Dwelling Site. Each group must find a good site for setting up their summer camp. There needs to be enough space to make homes for two or three families. Remember, Atsugewi summer houses were small enclosures no more than ten or fifteen feet in length. Make a list of reasons why you chose the spot you did. What makes it a good site? Decide where your houses will go. Draw the location of your camp on your map noting any landmarks.

2. Signs of Wildlife. Will there be any meat on the tribal table if you camp in the area? The animals hunted included deer, rabbits, squirrels, and other small mammals. Mammals provided more than just food; they provided bones, fur, and hides to meet other survival needs. Birds were also hunted for food and feathers. Waterfowl such as ducks and geese were hunted as well as grouse, woodpeckers, and colorful song birds. Look for any signs of wildlife and record what you see. It takes keen observation. **BE VERY THOROUGH!** Remember, the family's survival depends on your skills. Think about what method you would use to hunt the area's different wildlife. Methods included hunting with bows and arrows, knives, or spears, placing nooses along game trails, driving game into large pits, and snaring game. Write down the preferred hunting method next to any wildlife or signs of wildlife you have observed and recorded.

3. Fishing. Fish provide a very important source of food. Locate the best fishing sites for all the different ways Atsugewi fished. Methods included spearing fish with two-pointed or four-pointed spears, fishing with a simple hook or series of hooks attached to a line, and trapping fish in basket fish nets. Fish were also chased into pools created by partial rock dams and then scooped out with baskets and nets. When you find the fishing sites for the different types of fishing techniques, mark on your map where they are and the technique you would use. Note: If your group uses the Lily Pond Trail, you will have to pretend that there are fish in Reflection Lake and Lily Pond; there are no fish in these places.

4. Other Survival Necessities. Look around the area and list anything else in the environment that might be useful in meeting your survival needs. What might you use or make tools from? What plants might be useful and for what purpose? Describe anything you find or discover.

AMERICAN INDIAN TRAILS

SUMMARY: Students hike the Bumpass Hell or Devils Kitchen Trail or other trails and record field notes on a specific habitat. Back in class they write a story, legend, or myth based on their notes.

GOAL: To increase student awareness and understanding of the American Indian culture and its rich kinship with the environment

OBJECTIVES: Students will (1) record at least ten field observations about a specific habitat, (2) develop and answer at least five questions based on their observations, and (3) write a story, legend, or myth based on their field trip experiences.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: One to three hours onsite and one to two hours in the classroom

LOCATION: Devils Kitchen Trail (activity can be easily modified to use on other park trails)

MATERIALS: A pen or pencil, paper, and a writing surface (pieces of cardboard work well)

SUBJECTS: History/Social Science, Language Arts, Science

KEY WORDS: Story, Myth, Legend

BACKGROUND: The American Indians that live or lived in the area surrounding Lassen Volcanic National Park represent four tribal groups. The Maidu people lived to the south and east of the park. The Yana & Yahi people lived to the south and west of the park. The Atsugewi lived to the north and east of the park. Depending on the specific trail and site the students use, the Indian people may have walked, camped, hunted, or traveled in the area where the students will be walking.

INSTRUCTIONAL SEQUENCE: Tell the students that storytelling and legends have been an important part of the American Indian culture for centuries. These stories were woven from their everyday experiences and their close interdependence with the Earth. Explain that the students will be part of a tribe as they walk the trail. They will be Indians discovering their world. Divide the students into groups of four or five. Assign the groups the following habitats: water, forest, hydrothermal area and other highlights of the specific trail used. It is highly recommended that the teacher hike the trail before bringing up the students. Explain that while on the hike each student is to observe and take field notes on what he/she sees, hears, smells, and experiences in the assigned habitat. Students must stay on the trail while completing this assignment.

While visiting the habitat, each student is to develop and write down five questions about the habitat and things they observe on their walk. These questions will be answered back in class. These need to be open questions. A closed question has a short answer. An open question has a longer answer that requires more thinking and that may have more than one answer. Open questions often begin with how, what, or could, but not always. For instance, "what color is the most common flower in the meadow?" is a closed question. An open question is "what do you think causes the flowers in the meadow to grow where they grow?"

Explain that after the field trip the students will be required to write a story, legend, or myth based on their field notes. They will also have to answer their questions. Their questions and answers may be used in writing their stories. Make sure everyone is clear about the assignment.

At the trailhead, please review proper behavior and park rules. Establish a time limit for the hike and the activity. Have the class break up into their assigned groups and begin the hike. The groups will stop at their assigned habitats. The teacher may wish to spread the groups out along the trail. Stress the need for quiet and stillness in order to see wildlife.

Emphasize the need to stay on established trails and boardwalks and to follow all park rules. Back in class have the students answer their questions and then write a story, legend, or myth based on their experiences, observations, and questions. You may wish to have the students share their stories orally if time permits.

EXTENSION/ENRICHMENT: (1) Have the students draw a picture based on their story or experiences. (2) Have the students write a poem or song based on their story or their experiences on the trail.

ASSESSMENT: Student field notes, questions, stories, and presentations provide excellent samples for assessment. Simple questions about the park and the Maidu Indian culture could also be developed that provide for assessment for this activity.

GETTING PREPARED - PIONEER SURVIVAL KIT

SUMMARY: Students re-live the thoughts and emotions of early emigrants as they prepare for the great journey west to California. They decide what their family should bring in their own personal wagon. They join a "wagon train" and choose a wagon master. They must pare down their personal items for the good of the whole group placing varying degrees of importance on each item.

GOAL: To introduce students to the decision making process necessary to prepare for a journey across the country in a covered wagon and what supplies would be needed by the travelers

OBJECTIVES: Students will be able to (1) list twenty important items needed for the five to six month journey to California and (2) explain the importance of each item.

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: One to two hours

LOCATION: Classroom

MATERIALS: Paper, pencils

SUBJECTS: History and Social Science, Language Arts, Group Dynamics, Home Economics

KEY WORDS: Emigrant, Survival, Decisions, Hardship

BACKGROUND: Read any of the following books to gain a better understanding of what life on the trail was like: Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

If you or your students have any diaries of ancestors coming to California, these would add personal interest!

Most of the wagons used by emigrants were about ten feet long, four feet wide, and two feet deep. This box-like structure was covered by a curved canvas top that was tall enough for a person to stand upright in the center of the wagon. The goods were stacked about four feet high on either side of the wagon with a narrow path in the middle. Sometimes extra storage pockets were sewn in the canvas and an extra false bottom was added with foot deep storage compartments under the floor. Barrels and boxes were attached to the outside of the wagon to carry bulky items, water, extra tools, and wagon parts.

Emigrants who could afford it sent their large, valuable and/or breakable articles to California via ship around Cape Horn. This made packing their wagon much easier. For

many others this was not an option. They had to sell and leave behind many of their prized possessions. Either way, the essential items were about the same--non-perishable food, kitchen and cooking utensils, bedding, clothing, medicine, rope, tools, extra wagon parts, guns, ammunition, lamps or candles, and sewing needs. Optional items varied greatly and often included musical instruments, books, and a child's favorite doll.

The food eaten along the trail was very limited. Not only was the space to carry food on a five to six month journey small, but without refrigeration or preservatives only certain foods would keep. Naturally, the emigrants supplemented their stores with fresh meat such as buffalo, deer, rabbit, squirrel, or whatever they could hunt. Some of the emigrants or their scouts learned about edible plants from the Indians or previous explorers, however most of them did not have this knowledge. Food could sometimes be replenished at the few trading posts and forts along the way but that could be costly. Standard supplies in most wagons were salt port or bacon (packed in bran to try and keep it from going rancid, although it often still did), about 200 pounds per person of wheat flour, a bushel per person of dried apples, sugar, salt, a leavening such as saleratus, coffee, tea, and sometimes dried corn, dried beans, and rice. Because the last three items took a long time to cook, they were only cooked on layover days where abundant fuel was available. If a cow was brought along, fresh butter and milk were appreciated.

Due to hardships as the trip progressed (wagons breaking, too much weight in the wagon, bad roads, poor weather conditions, or family members dying), unnecessary items were often disposed of along the trail. Sometimes even whole wagons had to be left behind. The emigrants were faced with tough decisions the entire length of the trail and had to help each other.

INSTRUCTIONAL SEQUENCE:

1. Brainstorm and list on the blackboard human needs for survival such as food, water, shelter, and warmth.
2. Discuss how the emigrants might have met these needs in their journey across the continent.
3. Tell students to imagine they are embarking on such a journey. Have each student list the items they would pack in their wagon being sure to meet their survival needs and being as specific as possible. For example, they cannot just list food. They must tell what kind of food and how much, what kind of clothing they would bring and how much, what cooking utensils they would need, etc. See the background section for more information.
4. Divide students into "families" of four. The four individual students have fifteen minutes to pool their lists together and make a new family list. They must remember that everything must fit in their wagon. If it does not, they might not make it to California. See background information for size. They must agree on what to take and what to leave.
5. Bring the "families" together into a "wagon train." Who is going to make the crucial decisions for the group? The "wagon train" must now pick a wagon master. Let them

decide how they will pick that person. After the wagon master is picked, have his/her supporters tell why they think that person will make a good leader for the wagon train.

6. As often happened along the Nobles Trail, disaster strikes your wagon train. Due to the lack of fodder for the oxen, excessive heat, and heavy loads, some of the oxen have died. There are not enough of them to pull all the wagons. One wagon will have to be left behind. Whose wagon will it be? (The teacher should pick a group.) What will the group do with all the supplies and people that were in that wagon? What will be left behind with the wagon? The "wagon train" must come to a satisfactory conclusion that is agreeable to the group as a whole.

7. Discuss the group dynamics that went with the decision making on the family level and on the group level. Is there more than one solution? How was the conclusion reached? Is it satisfactory to everyone? Would it have made a difference if it had been another family's wagon?

EXTENSION/ENRICHMENT: (1) Have each student, then "family" estimate the weight of their proposed wagon load. (2) Measure out the actual size of a wagon. Draw it on the pavement. Pack all the items necessary for a trip across the country in this space. You can estimate the size of some articles and use empty boxes. This will give an idea of how it all fits. (3) Build a small scale replica of a wagon. Fill it with small scale food, clothing, tools, household items, water, medicine, and whatever else you think you will need. Items can be made from cardboard, construction paper, doll toys, clay, etc. (4) Check your local museums and historical societies to see old wagons and articles that were brought out to California in wagons. (5) Read Patti Reed's Doll. Look in the school library for other books on emigration to California. (6) List the following on a blackboard--dried beans, salt pork or bacon, coffee, tea, flour, sugar, salt, dried apples, saleratus (leavening agent), milk, and butter. Have the students figure out how much a family of four would need to bring on a trip across the country? Brainstorm about what could be made from these ingredients. Have each student design a daily menu, complete with recipes. Given these ingredients, have each student make something at home and bring it to school for a "feast." Students could add one or two extra ingredients that might have been brought along in the wagons as treats or found along the trail such as cocoa or fresh blackberries, etc. These should be approved by the teacher. (7) Make an "emigrant" dinner at school using only ingredients that were available to the emigrants. Use cooking methods and kitchen utensils that were used at that time along the trail. Biscuits can be baked in a dutch oven which is put on hot coals with hot coals placed on its lid. (8) Have the students dry fruit or vegetables such as apples or pumpkin. (9) Grind wheat berries or corn in a hand or small electric flour mill. Make something with the home-ground flour. Once corn or wheat is ground it goes rancid more quickly. Some emigrants probably brought dried corn and wheat berries and ground them when needed. (10) Discuss ways to preserve meat for a long journey. (11) Make jerky. (12) Make butter by shaking cream in a jar. Emigrants made butter by attaching churns of cream to the wagons; the bouncing would make it into butter.

ASSESSMENT: List 20 of the most important items that were taken on a wagon trip by emigrants to California. Write one sentence on why each of these items was important to the emigrants.

EMIGRANTS WEST

SUMMARY: Students will "meet" a typical pioneer family traveling the Emigrant Trail in the 1850s through a dramatic role-playing presentation.

GOAL: To introduce students to the hopes and hardships of a typical pioneer family traveling west in the 1850s

OBJECTIVES: Students will be able to describe: (1) A typical pioneer emigrant Family who chose to make the trip west. (2) how they traveled, and (3) what hazards they faced.

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: 30 to 45 minutes

LOCATION: Classroom

MATERIALS: Costumes for actors

SUBJECTS: History, Economics, Language Arts, Visual/Performing Arts

KEY WORDS:

Fort - a way-station to rest, make repairs, send and receive mail, and purchase or barter for supplies. These were not Army forts, but commercial establishments.

Dutch oven - a popular type of cast iron pot with lid that was used for baking and cooking directly on a campfire. Lewis and Clark used one on their expeditions. They probably got the name "Dutch" oven because Dutch salesmen supplied them to the emigrants.

Wagon - the main mode of transportation for the emigrants which was covered with canvas (painted for waterproofing) and was four by twelve by three feet deep. Wagons were purchased or built at home before departure. Iron straps reinforced stress points and iron rims on the wheels were used as tires.

Buffalo chips - dried buffalo wastes burned for cooking fires when wood was scarce on the Plains. Pioneer women were at first embarrassed to deal with them but were pleased to find they provided a hot, smokeless fire. Fires were built in a trough dug into the ground and pots were set across the sides of the trough.

Emigrants - families, traders, entrepreneurs, criminals, and seekers of religious freedom who journeyed to Mexican California and Utah, and the British-controlled Oregon Territory. They were called emigrants because they were leaving the United States as it then existed. The name "stuck" even after California was admitted to statehood.

BACKGROUND: Mountain men, fur traders, and explorers were the first Europeans to see the lands west of the Mississippi. By the early 1800s, their stories were contributing to a growing campaign to make the West part of the United States.

Factors that intensified interest in the new lands included economic depressions of 1837 and 1841, collapse of the international fur trade, British domination, missionaries anxious to spread Christianity, and the Mormons' New Zion in Utah.

It was not until 1841 that the first groups of emigrants left the banks of the Mississippi to head west. By 1843 nearly 1,000 had made the trip. Registers at Fort Laramie and Fort Hall showed nearly 400,000 travelers by 1852.

Guidebooks were soon available for the emigrants. Some had useful information; others were written and sold by people who never made the trip. The need for essential traveling items led to a flurry of trade at the main trailheads of St. Louis, Independence, and St. Joseph in Missouri and Council Bluffs in Iowa.

For the 2,000-mile trek, emigrants needed a wagon, tools, food stores, cooking utensils, bedding, and items for their new homes and businesses. Cash was needed to replenish supplies at the forts and for ferries and tolls. Everything had to fit in a 48 square-foot wagon bed. Sleeping was done outdoors or under a tent in bad weather.

Timing of departure was very important. Late spring was the preferred time because there would be water and grass for stock. Hopefully, the last mountains would be cleared before snowfall.

Landmarks were looked forward to, both to break the monotony of the trip and mark progress. Chimney Rock and Scotts Bluff marked completion of the first third of the trip. After a week's journey, Fort Laramie was reached. As migrants approached the Continental Divide, grass and water became scarce, the rough travel took its toll on the wagons, and buffalo herds--which supplied fresh meat and chips for fuel--became harder to find. Families were often forced to leave belongings along the trail to lighten the load.

South Pass was the halfway mark. Letters and diaries often mentioned that people were hardly aware they were on a pass at first, because of the gentle grade. Beyond lay a barren stretch, then the mountain passes that opened on California and the Oregon Territory.

At first, the Indians were curious, sometimes helpful, and anxious to trade with the travelers. There were few real stories of attacks, mainly on lone travelers. Stock and supplies did, however, disappear during the night on occasion. Resentment, frustration, and problems with some tribes increased later due to increased impacts on their lives from settlements, the railroad, and government policies.

Peter Lassen and William Nobles established trails leading into Northern California. Lassen hoped to bring weary newcomers to his Bosquejo Rancho (near present day Vina) where he had started a town and ran a small store. Nobles had scouted a better route, and was then

commissioned by Shasta City businessmen to establish, advertise, and lead a group through it. Lassen's trail acquired some derisive nicknames, due to the extra miles and reputation for getting people lost. Lassen himself had to be rescued at times. Nobles' trail contributed to the founding of the towns of Susanville and Redding. Both trails played a major role in shaping the development of Northern California.

INSTRUCTIONAL SEQUENCE: This activity requires that two students perform the skit while the rest of the class listens carefully. All of the students answer the three questions under "Assessment."

The following preparation needs to be done before the skit is ready to be performed.

(1) Review script. (2) Explain to the class that you would like two volunteers (one boy and one girl) to play the parts of pioneer emigrants traveling west for a skit to be performed before the class. Explain the reason for the skit. (3) Select actors. Skit Characters: Jacob and Ida Bell Taylor and their "baby." (4) Make or collect costumes. Jacob - old floppy hat and suspenders, beat-up shoes, worn shirt, and dungarees (there were no zippers in the 1850s). Ida Bell - bonnet or scarf, calico dress (to the ankles), apron, old shoes. Baby - doll or towel wrapped in a blanket. (5) Distribute scripts; practice roles. (6) Ask actors to write their lines on note cards OR prepare an overhead transparency of the script which can be projected on a screen behind the audience (a make-shift teleprompter). Use different colored pens for each actor's lines. You will need a "prompter" to move the script along for the actors. (7) Have the actors practice staging--entering the room, walking as if really tired, where to stop and speak to the audience, and exiting the room. (8) Once the actors are ready, announce to the class, "You are about to meet some important people--people who have decided to shape their own future by traveling 2,000 miles across the deserts, plains, rivers, and mountains of our country. The year is 1852; families are packing up and selling out to join the wagon trains in the westward migration. Most don't realize that they are helping to shape the future of the new frontier, California and the Oregon Territory." (9) Explain to the students that they need to listen carefully as they will have to answer some questions about the emigrants after the skit is over. (10) Begin the skit.

Suggestions for the teacher: (1) You may wish to begin the unit by asking the students if they were born in California, where their families (or ancestors) came from, and how and when their families emigrated to California. (2) If costumes cannot be borrowed or found somewhere, ask a few students to try making simple ones from felt, cardboard, or real calico and fabric glue. (3) If any of your students have seen the pioneer program at Lassen Park, they might be good candidates for this presentation. (4) If the "actors" can provide their own make-up to look dirty and sunburned, it would add a realistic touch. (5) You could also do this yourself as a monologue, by changing hats and voices. (It could be fun!) (6) Encourage the actors to stay in character despite some of the things their classmates might say. Suggest they "ad lib" some if needed.

EXTENSION/ENRICHMENT: Music - Listen to or sing popular songs from this time, such as songs by Stephen Foster or railroad and mining songs. Write some new verses to "Clementine" or "Sweet Betsy From Pike." Language Arts - Design or improve a mode of transportation; then prepare a three-minute sales talk for a group of prospective westward migrants. Videotape interviews with grandparents who have stories and keepsakes from their ancestors' migration to California. Social Studies - Research how the pioneers governed themselves while en route and how they dealt with the wrongdoings of others. Find out what the most common health problems were among the pioneers. What medical help, medicines, or herbal remedies were available to them? History - Use maps to explain how and when California and the Oregon Territory became part of the United States. Performing Arts - Students perform skits based on their own research of the lives of pioneer emigrants.

ASSESSMENT: Have the class answer the following three questions and then discuss their answers as a group. (1) Who chose to make the trip and why? (2) How did the pioneers travel? (3) What hazards did they face?

SKIT

Jacob: Well, howdy folks! I thought I saw a campfire out this way. Me and the Missus are scouting for some fresh water. Hope we didn't disturb you none. I'm Jacob Taylor and this here's Ida Bell with our baby. We're from Missouri...taking the Noble's Trail over toward Shasta City. Is that where you-all are from? Our group is staked out under the trees out yonder, resting the stock and starting dinner.

Ida Bell: Now, Jacob, don't go talkin' the ears offen these folks. I do apologize for interrupting your chores...I know I've got plenty of my own once we get back to camp....feedin' the oxen, washin' and mendin'. Jacob, you need to soak those wagon wheels...they got so dried out they shrunk and the iron tires just fell off!

At least I don't have to gather those buffalo chips for the fire anymore, like when we was out on the plains. Not a stick of firewood for miles! You all know what buffalo chips are, don'tcha? Well, like I was telling Mama in a letter, I wouldn't have touched them, not to mention talked about them to strangers before the trip, but that's what trail life does to a person. You do what you gotta do, or sometimes you just don't eat!

Jacob: Now look who's chattering up a storm! You'll have to forgive us, folks, but you're the first Californians we've met. After all these months on the trail, we're down right excited to be so close to our new land.

I was a printer back home and I'm aiming to start a newspaper in a California town. My press is crated up and going around the Horn on a ship bound for San Francisco. Should catch up with it by Spring. Don't mind tellin' you I couldn't find work back home...those cities are so crowded and dirty anyway, it seemed like making a new start was just the thing for my little family.

Ida Bell: I don't mind tellin' you this half of the little family was sorely tempted to turn right around and head back when we was on the plains. Why, that blisterin' sun made our faces peel and lips crack...the alkali water killed a few oxen in the group ahead of us. And the bad tempers!...men and women alike were using language I hope to never hear again. With no wash water, the baby's diapers had to be scraped and dried, then used again. Sure don't miss those dust storms...all day and all night...I thought I was going crazy.

Jacob: Heard tell of a few people who did go crazy. John Lewis's wife got so mad she set the wagon on fire! Abner Blackburn's missus just set herself down in the trail and refused to budge until he turned the wagon around, and they were all the way to South Pass...the half-way mark!

Ida Bell: Well, dear, she was broken-hearted about losing their child in that stream crossing. Can't say as I blame her. Stream crossings are bad enough...havin' to build a raft for the wagons, then haul them over one by one. The stock are forced to swim across and you can just imagine how stubborn they can be. It takes a full day, sometimes two...and still you lose a few animals. But to lose a child, well, that was more misery than she could bear.

I just can't bear it to see the graves along the trail...all those dreams...now turned to dust. Cholera's what did it mostly. I told Mama in my last letter, I said not to worry, we're takin' doses of a little something that was recommended for the cholera.

Jacob: We worried the graves might be from Indian attacks, but they haven't been a bit of trouble. Sometimes a horse or some food disappears at night, but mostly they leave us alone. We circle the wagons at night, but mostly to corral the stock, not cuz' of Indians. Course, we're in a big group...paid plenty to our guide, too.

Ida Bell: It was worth every penny, Dear. We heard a couple of folks travelin' alone got attacked, so we did the right thing.

Jacob: Packing light was the right thing, too. The wife spotted crates and boxes of beautiful things, china and furniture and the like, just litterin' the sides of the trail. People just couldn't carry 'em up those mountains.

Ida Bell: Jacob, Jacob, we must let these people be! You folks have been very kind, but we should let you get back to work. I need to start our dinner, anyway. At least the butter's made. I just milk the cow in the morning and hang the churn on the wagon. The swaying of the wagon churns up a nice little lump of butter just in time for dinner!

I'm sure happy my Jacob is on hiz' feet again. When he stumbled in that prairie dog hole and give his ankle a hard twist, why he had to ride in back o' the wagon! It fell to me to drive those onery oxen and set up the tent at night, all while holding the baby!

We should be in Shasta City by week's end! Soon I'll be cooking in our own home! Course, I had to leave all my pretty wedding china and silver with Mama; they wouldn't fit in the wagon. All I've got now is a kettle and an iron pot. Course, there's not much to cook in them...we've still got a bit of rice and beans left, some vingar for the scurvy, and flour and tea. We traded for some sugar and coffee back at the Fort, but they didn't last long. Why, the forts aren't Army forts at all! Just places to rest up and buy more supplies. Sometimes Jacob gets us something for supper, like a rabbit or a deer, but not too often.

Jacob: Well, Sugarplum, like I was tellin' you, game along the trail is getting harder to find. Why I heard that just a few years back, these lakes were covered with geese and ducks. Their wings made a thunderous roar when they took flight, and you could feel the breeze on your face. And I heard the fish were so thick in the streams you could cross over by walkin' on their backs. I guess it's not like that anymore, what with all the travelers and all...

Ida Bell: The register at Fort Laramie said that 30,000 people, 7,000 wagons, and 50,000 livestock passed through ahead of us! We'd better hurry on now Jacob, before all the land is taken up and spoiled, just like back home.

Jacob: Well, it's still better than back home. Such beautiful forests and clear streams, and such good soil! Us newcomers will remember to take care of the land, so what happened back home won't happen here. You'll see, Darlin'.

Ida Bell: I suppose, Dear. Why these folks here seem to be right prosperous, so maybe it will be better than back home. It would mean a lot to us to raise our children in a land with such promise. Now Jacob, we must go. Good-bye, friends. Thanks for the visit and please wish us well!

Jacob: So long! Good health and fortune to you!

(Exit)

TRAVELING WEST - HARDSHIPS AND CHALLENGES

SUMMARY: History comes alive! While traveling on foot along the historical Nobles Emigrant Trail in Lassen Volcanic National Park students will listen to excerpts from emigrants diaries. They will then experience some of the same hardships and challenges through teacher-led activities.

GOAL: For students to gain an appreciation for what life was like for the early emigrants who traveled the Nobles Emigrant Trail

OBJECTIVES: Students will be able to (1) list at least three hardships faced in daily emigrant life on the trail and (2) write a paragraph in first person depicting life on the trail through the eyes of an emigrant child.

GRADE LEVEL: Fourth through sixth

TIME REQUIRED: You have four options depending on where you go and the time available.

OPTION 1. (1 to 2 hours, 1 to 2 miles) From where the bus leaves you on the park road at the Emigrant Trailhead, take the class part way up the Emigrant Trail. When half your time is gone, return along the trail to where the bus dropped you off.

OPTION 2. (3 to 4 hours, 4 miles) Have the bus drop you off at the Emigrant Trailhead. Hike the four miles of Emigrant Trail west and have the bus pick you up at the Manzanita Entrance Station. You can picnic along the way.

OPTION 3. (1 to 2 hours, 1 to 2 miles) From the Butte Lake and the Cinder Cone trailhead, hike along the Nobles Emigrant Trail as far as desired, returning along same trail.

OPTION 4. (2 to 3 hours, 3 to 4 miles) Do Option 3, adding a hike up to the top of Cinder Cone. This is quite steep and is not advisable for all groups just as it was not climbed by all pioneers who came via this trail. However, some of the pioneers ventured to the top to get their bearings and admire the view. If you have a willing and able class, this is a great hike. PLEASE STAY ON THE TRAIL AND CARRY WATER.

LOCATION: See above options. If it is not possible for your class to go to Lassen Park, this activity can be done at any local state, county, or city park with trails.

MATERIALS: Student Worksheet (one per student), pencils (one per student), lined paper and hard surface to write on or journal, Team Leader Instruction Page (one per group), Pioneer Quotes (one set per team leader), extra pair of socks (and shoes in wet weather) to leave on bus, and extra clothing if weather dictates (leave on bus).

Each student should have a day pack with the following items brought from home: two bandannas or scarves large enough to tie on his/her feet, extra pair of lightweight shoes

which are either one size too large or small for that student, pioneer food (see background information), filled water bottle or canteen, and lunch (optional).

SUBJECTS: History, Social Science, Science, Language Arts

KEY WORDS: Emigrant, Pioneer, Hardship

BACKGROUND: Read any of the following books to gain a better understanding of what life on the trail was like: Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

If you or your students have any diaries of ancestors coming to California, these would add personal interest!

Foods eaten along the trail were very limited. Considering the length of their journey, emigrants had very little space to carry food. No room for extra delights! Also, of course, they had no refrigeration or preservatives. Standard fare was usually salt pork or bacon, biscuits, dried beans (which could only be cooked on layover days where there was lots of fuel), dried apples, and coffee. If they were lucky enough to have a cow along, fresh butter or milk was available. Of course, they tried to supplement their rations with fresh meat such as buffalo, deer, rabbit, squirrel, or whatever they could get. Only a few emigrants learned about edible plants from the Indians or previous explorers. Most of them did not have this knowledge. Food could sometimes be replenished at the few trading posts and forts along the way but that could be costly.

INSTRUCTIONAL SEQUENCE: It is highly recommended that the teacher visit the site and walk the trail before bringing the students to the park.

Before the field trip, have the students prepare and pack an "emigrant snack." Each snack package should contain enough for a team of four students and one leader. Each package should consist of cooked dried beans, biscuits (preferably a day or two old), bacon, coffee or tea, and dried apples.

Before the field trip, divide your students and adult leaders into groups of four students per adult leader. Make a schedule showing when each team starts on the trail.

Before the field trip, meet with the adult team leaders and go over the Team Leader Instruction Page, their time to start on the trail, and any other information and expectations for the trip.

Onsite Nobles Emigrant Trail:

1. Enter the park at the Manzanita Lake Entrance. Stop at the Loomis Museum or Manzanita Lake picnic area to use the restrooms. After a quick stop, proceed on the park

road a few miles south to the Emigrant Historical Marker which is a large turnout on the right side of the road just south of Road Marker No. 60. Have the bus drop your class off. There is a large open area where you can gather your class together. Make sure the students have their day packs and all needed supplies (including lunch if you plan to have it on the trail). They should leave a change of socks, shoes, and any extra clothes not needed on the bus.

2. Divide the class into their teams. Make sure each team leader has the Team Leader Instruction Page. Groups should start out at a staggered rate of approximately two to five minutes apart so there is some feeling of isolation while walking along the trail.
3. The Emigrant Trail takes off from the other side of the road at Marker No. 60, approximately 100 yards back towards the Jumbles Area. Each leader should take their team across the road and start up the trail in their assigned order. The teams that are waiting to start can work on questions marked "Bus Stop." The first teams to start can do these questions while they are waiting at the end of the activity.
4. Each team will proceed down the trail following their Team Leader's directions. There are no specific spots for the stops. This gives each class leeway to adjust to its own time constraints. Try to stop where you cannot see another group. If your class will be doubling back on the trail to meet the bus at the Emigrant Historical Marker, do all the stops on your way out and walk quickly back being sure not to disturb the other teams that are still working. If your teams will be hiking the four miles to the entrance station, the stops should be spread out farther apart along the trail. (Use five minute interval for hikes doubling back, ten minute intervals for the longer one way hike.)
5. When all groups have completed the trail and their worksheets, gather the class together and discuss their experiences, how they felt about the activity, and how they would feel if they were actually emigrants on the trail.

Note: If your class is going to Butte Lake/Cinder Cone, follow the Team Leader Instruction Page and No. 5 from above.

EXTENSION/ENRICHMENT: (1) Have each student write a first person account of what life on the trail might have been like. (2) Read Patti Reed's Doll. (3) Read any appropriate excerpts from books listed in the background section above. (4) Research the different emigrant trails to California. (5) Research clothing and food eaten along the trail. (6) Have students play the computer game called Oregon Trail. (7) Make a replica of a wagon as a class project. (8) Have each student research how their own family came to California. (9) Get a guest speaker from the local historical society to share experiences of local emigrants.

ASSESSMENT: Each student will complete questions on the activity sheet along the trail and participate in a group discussion at the end of the onsite activity. List three hardships experienced by the emigrants on the Nobles Trail. Write a paragraph in the first person depicting life on the Nobles Trail through the eyes of an emigrant child.

TEAM LEADER INSTRUCTIONS

Each team leader will need to bring one set of quotes (A through F) on the trail.

Depending on when your group starts the trail (determined by teacher), you will have time at the beginning, end, or on both sides of this activity. While waiting, have the students in your group answer the two things under Bus Stop. If your group finishes them, pretend that you are a scouting group and explore the nearby vicinity, taking notes on anything that you think might be of importance (and why) to your wagon train.

When it is your turn to start, walk down the trail for approximately five minutes. Try to pick your stops so you cannot see another group. If that is not possible, try to orient yourself so that when the students are looking at you, they will not see the other group.

Stop 1: Read Quote A. Tell students that you would like them to use their imaginations and pretend they are emigrant children walking the trail in 1853. As a warm up activity, have the students do an "Emigrant Walk." The adult leader will start on the trail and walk approximately 30 feet. The first student will start, following the Team Leader and staying 30 feet behind him. When the first student has walked 30 feet, the next student will start. Repeat this procedure for each team member. This will make a single file line where each participant is 30 feet apart but within sight of the team member in front of him. There should be no talking along this section of the trail so that each student can experience the feeling of solitude.

Stop 2: After the Team Leader has walked for approximately five to ten minutes, stop and gather the group together. Have the students answer the questions listed under Stop 2. Walk for five to ten minutes.

Stop 3: Stop and read Quote B. Ask them the following questions. Do you think the trail looks the way it looked to the emigrants? How old do you think these trees are? Do you think the same type of trees grew here in 1853? Do you think there were this many trees then or could it have been more open? What might be the same now as then? Why? What might be different? Why? Walk quietly along the next stretch of trail (five to ten minutes) noticing things that might be the same or different.

Stop 4: Answer the questions listed under Stop 4. Walk for five to ten minutes.

Stop 5: Read Quote C. Ask each student to find a protected "sleeping" spot and lay down there. Without talking, students should stay in their spots about two minutes and imagine what it might have been like to sleep in a similar manner but in different spots along the 2,000-mile trail, for six months. They can then answer questions under Stop 5. Hike five to ten minutes.

Stop 6: Stop for a pioneer snack break and read Quote D. Answer questions listed under Stop 6. Walk for five to ten minutes.

Stop 7: Read Quote E. Have the students put on the extra pair of shoes they brought in their pack (these should be one size too big or too small). Walk down the trail for a few minutes.

Stop 8: Have students answer questions listed under Stop 8. When done, they can remove their shoes and tie the bandannas onto their feet. Read Quote F. Walk down the trail for a few minutes. Note: This should be done near the end of the hike, especially if the ground is wet or the weather cold, so students can immediately change into dry socks and shoes when they reach the bus.

Stop 9: Back at the bus. Students should answer the question listed under Stop 9 plus do the two things listed under "Bus Stop." Have students change into dry clothes if necessary.

STUDENT WORKSHEET

Bus Stop: Things to do while waiting at the beginning or end of this activity.

1. By the time the emigrants reached what is now Lassen Volcanic National Park, they were nearing the end of months of hardships and adventures. They had experienced excessive heat, extreme cold, wet weather, dry deserts, blowing winds, hunger, fear of the unknown, the loss of almost everything they knew or had, sickness and maybe even the death of loved ones. Put yourself in their shoes. Imagine that your wagon train has stopped here (where the future Lassen Park will be) and you are resting. As you look around, write a short paragraph on what you might have thought about as you approached what would be your new home.

2. If your family decided to emigrate across the country to a place that was wilderness and you could only take what fit into your family car, what would you take and why? List at least 20 items. Be specific!

Stop 1: Try to imagine what it was like leaving everything and everybody you knew behind and going along a virtually unknown trail to an unknown new home. Think about this as you do the "Emigrant Walk." Follow your Team Leader's directions.

Stop 2: Describe your feelings as you walked alone along the trail. Do you think that the emigrant children had the same feelings as you did today? Why or why not?

Stop 3: Discussion with Team Leader.

Stop 4: What do you think this spot looked like when the first emigrants came along? Name three things that might be different. Name three things that might be the same.

Stop 5: What sounds might you have heard at night? Do you think the pioneer children were ever afraid of the dark? Do you think they got used to sleeping outside?

Stop 6: Would you like to eat this food day after day? Do you think the pioneer children liked it?

Stop 7: No questions

Stop 8: Have you ever outgrown a pair of shoes and still had to wear them? What could you do to be more comfortable? What do you think the emigrants did? How would you like to walk 10 miles a day in shoes that don't fit?

Stop 9: Have you ever worn moccasins? How do you think they would compare to bandannas?

PIONEER QUOTES

Quote A: "On the trail and into the unknown. Aside from the thoughts of home (on which we do not dare to dwell too much for fear of that dread distemper homesickness) and what may wait us at the end of the road--our thought, our hopes, our fears, and our anxieties are all centered about the train--the health and spirits of the company, grass and water for the oxen, and in a limited way, fuel with which to cook our meals. Rumors of hostile Indians are floating in the air most of the time, and while we pay little attention to them, we cannot altogether dismiss them from our minds, so that you can see that the world in which we actually live scarcely extends beyond the dust of the train by day and the smoke of the campfires at night." John Benson

Quote B: "For some time now we have been traveling through very rough country, where there is very little level ground though the scenery in many places is inspiring and unusual. The forest is open making it easy to move our wagons. The open forest is dotted with big trees and there isn't much brush. We have traveled 15 miles and still haven't found water."

Quote C: "Getting use to sleeping in unknown places has been hard. You must cultivate the habit of sleeping in any kind of surroundings, on a board, in a wagon, or outside under the stars. I think the sounds or lack of sounds at night make for feeling uncomfortable. I'm not sure which is worse."

Quote D: After stopping for the winter Lucy Rutledge Cooke joined a wagon train headed west with her infant daughter and husband: "Our company now consists of six wagons, thirty-seven head of cattle and three horses. Mrs. Holly rides in a light horse wagon as we did last year. Directly we joined this company Holly put three yoke of fine cattle on our wagon, which is only lightly laden, having but five sacks of flour besides our bed and clothing. I assure you it is somewhat different to riding behind cows. Why, we travel right along, through mud, over mountains, snow, or anything that happens to come next. So, as I before said, so far as teams are concern (and surely that's the main thing) we have made a happy change. But we live very poorly. The bacon is awful--so musty--and no vegetables; nothing but bacon, bread, and dishcloth coffee. Oh, how I missed the milk and butter that Greeleys had. William has tried around the camp and has got a cow to milk and has the milk for his trouble, so as long as its owner travels with us I shall have plenty. And now I have five pounds of butter, which is choice as gold. I got it off Greeleys when we left them. I should not have been thus favored, but I happened to have a pair of new leather shoes I bought in the valley for three dollars, and as one of their women folks was near barefoot, they were glad to make the trade. So they paid the half in butter at 30 cents per pound, and the accommodation was mutual, for I did not need the shoes."

Quote E: "Shoes or a lack of them was a problem. To keep what's left of our kids shoes soft enough to wear through the day, it was necessary to soak them in water every night. With all this walking on such rough ground it's amazing that anyone even has any shoes left."

Quote F: "When weary travelers' shoes wore out they had to wrap their feet in any cloth they might have or be willing to tear apart. With all those sharp rocks it was easy to tear up your feet or worn out shoes. The lucky ones bartered for moccasins from Indians or trappers."

EMIGRANT LIFE ON THE TRAIL

SUMMARY: Students prepare costumes and props, and then act out mini-plays portraying various aspects of emigrant life on the trail.

GOAL: For students to gain an understanding of the daily chores and responsibilities of emigrant life along the trail to California

OBJECTIVES: Students will be able to (1) Describe daily chores of emigrant life and (2) Compare these chores to their own chores today.

GRADE LEVEL: Fourth, fifth, and seventh

TIME REQUIRED: Four hours (two in the classroom and two at Lassen)

LOCATION: Classroom and Lassen Volcanic National Park

MATERIALS: Large pieces of cardboard, sheets of butcher paper, paints or crayons, pencils, clothing and props from home (optional), scripts of mini-plays (included with activity), books visually depicting emigrant life (optional), and video camera (optional).

SUBJECTS: History, Social Science, Drama, Art

KEY WORDS: Emigrant, Responsibilities, Chores

BACKGROUND: Lassen Volcanic National Park has a rich pioneer history. Approximately 23 miles of the historic Nobles Emigrant Trail run through the park. Many of the emigrants traveling to California and specifically into Northern California used this trail. Students are asked to depict scenes from emigrant trail life. The short scripts and mini-plays portray some of the responsibilities and chores of daily trail life. Hopefully, the mini-plays will share moments of what life was really like for those traveling the long and hazardous trail to California.

Library, or textbooks with pictures of life on the trail would be useful. Reading appropriate excerpts from any of the following books can help "set the stage." Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

INSTRUCTIONAL SEQUENCE:

PART I - CLASSROOM

1. Share the following information with your class:

Many of the emigrants who came to California via the Nobles Trail were not newcomers to moving. Some were restless adventurers, others kept moving farther and farther west in

search of the ideal homestead. However, their early moves had been through semi-settled land. This last move was through harsh and unsettled lands and involved greater distances and hardships. Luckily, most emigrants were accustomed to hard physical work from homestead life, so they were well prepared for the tough physical work of trail life.

Wagon trains were like small villages on the move. A good day of travel was fifteen miles. The rest of the daylight hours were spent setting up and taking down camp, as well as daily chores. Labor was divided up, and everyone had to do their share. Men usually did all the work associated with moving the animals and livestock, herding the cattle, hunting, and fishing. The women took care of the food, laundry, small children, and cleaning. Older children helped their parents with all chores. The lines between men's and women's work became blurry on the trail. By necessity, whoever was able to do it, had to.

By the time the emigrants reached what is now Lassen Volcanic National Park, they were near the end of many months of hardships and adventures. They had experienced excessive heat, extreme cold, wet weather, dry deserts, blowing winds, hunger, fear of the unknown, the loss of almost everything they knew or had, sickness, and maybe even the death of loved ones. There were also good times, beautiful scenery, newborn babies, marriages, new friendships, and proud feelings of accomplishment. Through it all they had worked hard just to survive. The class will have the opportunity to experience small pieces of emigrant life.

2. Divide the class into groups of five students. There are five parts in each mini-play. This is adjustable as are the scripts.
3. Give each group a script for one mini-play and have them read through it. Each student picks a part. Each mini-play will be about two to three minutes long. After familiarizing themselves with their scripts, students can add additional lines or actions. Students should try to be creative and personalize their plays as much as possible.
4. Have each group discuss different props they could use to make their play more realistic. Suggestions include but are not limited to (a) murals on butcher paper which can be hung up between two trees (remember to bring string and scissors), (b) scenes on large pieces of cardboard that can have the sides folded back so that the piece will stand up, and (c) props and costumes brought from home. Reading through the scripts will give you more ideas.
5. Give groups adequate time to design, make, and collect their props.
6. Teachers may want to use extra students or students who are shy to help with costumes, props, and cameras.
7. On the day after props have been made and collected, students should go outside, weather permitting, to practice their mini-plays. Have them spread out on the playground so that they will not interfere with each other. They should go through their mini-play a number of times until they are familiar with their parts.
8. If performing this activity at Lassen, have each group carefully package their scripts and props in a box to be taken on the field trip to the park.

9. If your class is unable to perform their plays at Lassen, then any other state, county, or city park could be used. Schools can also use their own school grounds and may wish to invite other classes or parents to watch.

10. If time allows, students can play emigrant games.

NOTE: When all the work was done, and if they had enough daylight and energy, emigrant children often played games. Since they were not able to bring much with them, they had to use their imaginations. Here are some of the simple games they played.

"Indians in their tipi's"

Break the class into groups of 10 to 15 students and have them stand in a circle. Pick one student to read the following rhyme, pointing to a different player with each word. The rhyme should be repeated twice. The player that is pointed to on the last word, the last round, is the Indian "it."

Heater, beater, Peter mine,
Hey Betty Martin, tiptoe fine,
Higgledy-piggledy, up the spout,
Tip him, turn him, round about,
One, two, three;
Out goes he!

Another jingling rhyme which can be used:

One-ery, two-ery, hickory Han,
Phillisy, follisy, Nicholas John;
Spinkum, spankum, winkum, wankum,
Twiddlum, twaddlum, twenty-one.
O-U-T, out,
With a white dish-clout-out!

The chosen Indian draws circles on the ground. These are tipi's to hold the players who are caught. Meanwhile, the other students will be the emigrants and chose a base. This can be a rock or tree and is their safe wagon. The Indian tries to tag (catch) the emigrants. The emigrant caught, stands in a tipi circle. They cannot escape unless tagged by another free emigrant. Once an emigrant is freed, the Indian can not catch him again until he has returned and tagged his wagon base. The Indian can, however, tag the emigrant who set the captured one free. The last emigrant to be caught is the Indian for the next round.

"Hop, Step, Jump!"

Divide the group into groups of five students. Each student picks a rock or small stick to be used as a marker later. Each group draws a line on the dirt, and then stands in a line behind it.

Taking turns, one person goes through the complete Hop, Step, Jump sequence before another group member starts. The first student in each group takes one hop, landing on one foot, making sure his/her raised foot does not touch the ground. When the student is balanced, he/she takes a giant step with the raised foot. Finally, the student jumps with both

feet together, marking the spot with his/her rock or stick marker. Continue in this manner, giving each group member a chance. The winner is the one who went the farthest. Note: If desired, have all the group winners compete against each other, continuing until you have a class winner.

Other games which can be played are "Hide and Seek," "Kick The Can" (or pine cone), and "Tag." Challenge the students to think of other games to play.

PART II - MINI-PLAY PERFORMANCE

This activity can be done at a number of locations at Lassen. An excellent location to begin this activity and park a school bus is the turnout just south of the Emigrant Trailhead on the Lassen Park Road. At this spot is a historical marker commemorating the Nobles' Emigrant Trail and a huge open area ideal for the mini-plays; it is located just off the Nobles' trail and was most likely a campsite for the early travelers. Other possible locations include Manzanita Picnic Area, Emigrant Pass at the Devastated Area, Lost Creek Campground, Butte Lake Picnic Area, or the Southwest Campground.

1. Gather students in the open area. Divide them into the same mini-play teams used to practice in the classroom. Give each team their scripts and prop box from the classroom preparation.
2. Define the area you want them to stay in. Give all groups 15 minutes to set up their props, get costumes on, and rehearse if desired.
3. When all groups are ready, gather the class back together. Decide the order to view mini-plays. (This could be done before the field trip.)
4. View each mini-play together as a class. Hopefully you will be able to videotape each play for classroom viewing later. Photographs can also be taken and used for a bulletin board display in the classroom or for open house.
5. After each mini-play is presented, discuss the various aspects of emigrant life that were portrayed. Compare the chores done on the trail with chores that are done today. What are some similarities? What are some differences?

NOTE: Much of the dialogue in these plays comes from actual pioneer journal entries!

EXTENSION/ENRICHMENT:

Students make up their own mini-plays, or modify these to meet their own interests. Ask families to share any artifacts or diaries they have. Have students research how their families came to California. Research emigrant or pioneer chores such as cooking, washing, candle-making, weaving, spinning, patchwork, fire-making, soap making, blacksmithing, etc. Students can make up other scripts dealing with music and evening entertainment, gathering water, bathing, night duty, meeting Indians, and storytelling either to children around the campfire or to another wagon train met on the trail. This is a good way to share interesting tales you come across in research.

ASSESSMENT: Have students describe three daily chores done by emigrants while traveling on the trail. Compare chores that were done on the trail with chores they do now. What are some similarities? What are some differences?

MEAL PREPARATION SCENE

Actors: Mother, 12 year-old Sue, Widow Sarah, 8 year-old William, 3 year-old John, baby (use doll)

Scene: Mother is stirring a pot and tending the cooking fire, John playing hand games with Sue, baby lying on blanket watching, Widow Sarah mending clothes, William sulking in the background, then teasing Sue and John.

Mother: I sure appreciate your help, Sarah.

Widow Sarah: Working together has sure made it easier for both of us. I don't think I could do this by myself, with Frank gone. (Sighs) I sure miss him.

Sue: Mother, please tell William to stop!

Mother: William, if you don't stop, you'll get the switch. I'm too tired to have to talk to you about your behavior.

William: (Coming over to the fire) I just wanted to play too. When are we going to get there? I'm tired of traveling. It's so much the same every day. I want to be there. I thought we were in California already.

Mother: We are. We just have a few more days. I know it's hard to be so close. Go find some willow sticks to cook the bacon on.

William: Yes, Mother. (Hesitates) I'm hungry. When is dinner going to be ready? I can't wait to eat something besides bacon and biscuits. It doesn't taste good any more. At least we get beans tonight!

Widow Sarah: I think I smell something. (William looks at the baby and runs off to get the sticks.)

Sue: I'll check the biscuits. (Quickly lifts lid of Dutch oven so coals don't fall on biscuits) They are almost done. I'll get everything ready for dinner. (Looks at baby out of corner of her eyes and looks very busy getting eating utensils set up on top of a barrel. Meanwhile, John grabs a dishcloth and starts pretending to wash it in a nearby water bucket.)

Mother: (Goes to pick baby up and change diaper) Okay, Charles, I'll see what I can do for you.

Widow Sarah: Thank goodness we're near water again so you can wash the diapers.

Mother: Yes, remember when we were in the desert and didn't have much water? I didn't like just drying the diapers, then scraping them, and airing them out. But what choice did we have? At home I would wash diapers every other day. But there were so many days on the trail that we just didn't have the water to spare.

Widow Sarah: I heard that the Indians used dried moss and grasses. That would sure make it easy, at least when there is grass.

Mother: (Putting baby down and stirring dinner) It's hard to believe we're almost done with this traveling. I find myself looking forward to cooking on a stove again. It will seem so easy.

Widow Sarah: I can hardly believe that when we started this journey, I couldn't cook on an open fire. I couldn't even get the kettle to stand up straight and I always had smoke in my eyes and ashes in the food.

Sue: Remember that sandstorm that came on while we were cooking in the desert? You could hardly recognize anyone our faces were so dirty. I thought I was going to die when James walked by and saw me like that! And the food, no one could eat it with all that sand in it. We had to throw it away and make more!

Mother: I remember trying to cook in that terrible hailstorm, the one that seemed to last forever and had those huge hailstones. I couldn't stand being pelted so hard and went into the wagon. By the time I came out the beans were burned.

John: I remember the yummy berries we collected. (Still playing in the water bucket with the rag)

William: (Returning with willow sticks) I remember the fresh buffalo meat. I'd sure like some right now. Hey, what is John doing? (They all look over and gasp.)

Mother: Oh, no! He's washing the dirty, soapy dishrag in our drinking water.

John smiles, scene over.

BOYS GATHERING FIREWOOD

Actors: Matt, David, Milton, Sam, Caleb

Scene: Boys walking through woods collecting wood, stopping to chat.

Matt: This place is pretty nice, huh? I like it here and there's plenty of wood. Pretty too.

David: Yes, I hope where we're going in California will be as nice as this. I like all these big trees!

Milton: There weren't any trees like these in Illinois.

Sam: They look especially good after all that barren desert. I thought we'd never get across.

Caleb: I was afraid that California was going to look like that.

Matt: I thought we were never going to collect wood again.

David: How come?

Milton: I know! You thought we were going to have to cook on buffalo dung forever.

(Boys all laugh)

Sam: It did work to cook the food but I sure didn't like collecting it. I guess I'm glad it was there though since there weren't any trees.

Caleb: I got used to it. I could gather a bushel in a minute.

Matt: Yea, me too. Too bad it took three bushels to make a good cooking fire.

David: I couldn't believe my Mom. She didn't take kindly to having to cook over buffalo and cow dung. It's the only time I ever heard her swear.

Milton: My Mama didn't mind so much. She said they made a good fire.

Sam: I was glad to have the stuff around when we were in mosquito country. Those dung smudge pots sure kept the mosquitoes and gnats back.

Caleb: My Mother would light one of those buffalo chips and put it in our wagon. It smelled bad but we could stand it longer than the bugs!

Matt: Hey, there's a lot of dead branches over there!

David: I hope it's some of that manzanita. That stuff burns nice and hot.

Milton: That would be great, then maybe we won't have to get so much.

Sam: Let's get a good load anyway so we can have a longer fire.

Caleb: Yea, I hear we might have music and stories tonight. Let's go.

Boys all head off, scene over.

WOMEN WASHING

Actors: Agnes, Catherine, Lavinia, Helen, Mary

Scene: Near a stream's edge, flat rocks along the shore, women in various stages of washing. They should be tending to one or more of the following chores--sorting clothes, tending the fire, scrubbing clothes on rocks or washboard, stirring clothes in a washtub with a broom handle, taking them out of tubs of "boiling" water, hanging clothes on bushes or laying them out on grass. Talking while they work.

Agnes: I certainly will be glad to get this job done. Just think, this might be the last time we have to do this on the trail. Next time we might be in civilization.

Lavinia: Well, we still don't know how civilized things will be in California. And we don't know if we'll be there in two weeks. We've heard so many stories that I don't know what to believe anymore.

Catherine: Don't let yourself get discouraged. I believe we truly are almost there. Look on the bright side. Doing the wash in California couldn't be any harder than what we've been doing on the trail.

Helen: That's for sure. I've gotten to really dread this job. I didn't even like it back in Missouri. I thought it took a lot of time then. What I wouldn't give for the good old days.

Mary: At least we have a stream nearby to wash in today. That's an improvement. We don't have to carry the water so far.

Agnes: I never thought I was going to get our clothes clean again. Having to do everything in one pot--heat the water, wash and boil everything, then rinse.

Lavinia: I always prided myself in keeping my family clean and neatly dressed. Sometimes I get so discouraged and frustrated!

Catherine: Now, Lavinia, calm down. I'm sure your whites will sparkle again in your new home.

Helen: At least the water here is not so hard as it was at our last wash stop two weeks ago. That washing took all my strength and a huge amount of my soap. Even then, the clothes did not come out looking clean.

Mary: Just think about how much dirt is in these clothes! What with not doing the laundry but every two weeks, the long, hot, dusty days on the trail, and the endless chores, why, there must be ground dirt in every fiber!

Agnes: You're right. We should feel good about what we are able to do under these conditions.

Lavinia: Well, I still don't like having to work this hard and then having to lay the cleaned clothes on the grass or a bush to dry. The worst is when they don't dry and I have to hang them all over the wagon while we are traveling. They get dirty again before we even wear them.

Catherine: I don't think I would advise anyone who comes west to wear white, or for that matter, anything fancy. Plain, simple cut calico dresses are much more practical. They don't show the dirt as much. Remember that frilly white dress you bought, Helen. It's brown now!

Helen: Yes, I'm going to write my sister, who hopes to come out next year, and tell her to bring pillows and clothing made in dark calico and colored sheets.

Mary: I know one advantage of doing the wash on this trip.

All others: What?

Mary: No ironing!

Laughter, end scene.

SETTING UP CAMP

Actors: George, Jessy, Peter, Henry, Lowell

Scene: George and Peter working on a broken wagon wheel, Jessy and Henry setting up a tent, and Lowell digging a trench around the tents. (Remember, everything is protected in a national park, Lowell just pretends to dig!) They are talking while working.

George: I don't think this old wagon will make it much longer. It's taken a beating.

Jessy: The road in some places is much rougher than we were lead to believe. I'm not so sure all those guides who wrote those books actually traveled the trail, at least not with wagons.

Peter: I think you're right. These trails wouldn't look so bad on horseback.

Henry: Thank goodness the last part of this trail hasn't been so bad. Once we left the desert we've been making good time.

Lowell: Well, from what I hear, this is by far the easiest way to get over the Sierra Nevada range and into California.

George: I talked to one man who was headed back east and he said he had been over the Sierra Nevada in seven places and this was the only one with a natural good pass.

Jessy: I heard that on some of the passes, they actually had to unload the wagons and carry everything to the top, walk the oxen up, then attach the oxen to the wagons by long ropes and chains. The poor men and oxen worked together to pull those wagons up cliffs!

Peter: Sounds like a lot of extra work. I'm glad we found out about this route.

Henry: Darn, looks like we've run out of decent wheel pegs. I'll find a piece of wood and carve another one. (Looks around, finds 9-inch stick about 1-inch thick, pretends to whittle the end to a point)

Lowell: I'll just keep digging this ditch. It looks like it might rain tonight. (Works around the spot where Henry just left)

George: We appreciate your helping us and digging around our tents. Last rain storm I didn't have time to dig a trench around my tent and everything got soaking wet. Even hanging it up in the wagon all day didn't dry it out.

Jessy: We're lucky, the wife and I can sleep on top of the goods in the wagon if we need to. There's been enough rain to make me glad we had that option.

Peter: We sure can't fit in our wagon, just too much stuff. We can only get one of the kids in at a time.

Henry: There, I'm done with one. I'll make a couple more.

Lowell: I'm glad I brought as many tools with me as I did. I know they'll come in handy on my homestead.

George: I'm glad you brought them too. Otherwise I'd have a harder time fixing this here wheel.

Jessy: Looks like the rest of the wagons are completing the circle. We can let the livestock feed outside of the wagons for awhile before letting them into the circle. It sure helped me to sleep easier in Indian country knowing that the livestock was surrounded by our wagons.

Peter: Guess I'll go over and start unharnessing the other horse now that we have this wheel almost finished. (He heads over and starts unsaddling.)

Henry: Tents are up, we're ready for rain. I'm going down to the stream to start bringing water up.

Lowell: Take a little rinse off while you're there. You could use it!

End scene.

HUNTING, SCOUTING

Actors: Joseph (16 years old), Erwin (father), Irene (17 years old), Elizabeth (15 years old), Margaret (13 years old)

Scene: Walking, then stopping, looking around and crouching behind bushes.

Irene: I hope we find a deer. I'd sure like to taste some fresh meat, Father.

Erwin: Me too, honey. You girls keep a sharp look out.

Joseph: I can't believe you taught your girls how to hunt.

Margaret: And why not, Joseph? We can hunt just as well as you can!

Irene: Now Margaret, don't get so uppity. All of our friends back home would think it was unusual too. How many of your friends would even think about going out and hunting?

Margaret: I know. It might mess their frilly dresses up. I'm sure glad we haven't had to wear anything like that for awhile. I like wearing these bloomers and don't want to go back to dresses.

Irene: Bloomers sure are more practical to work in but they don't look very feminine!

Elizabeth: Shh! I heard something. (They stop and listen) It's nothing I guess.

Erwin: There doesn't seem to be much game here.

Joseph: Certainly nothing like there was on the prairies. There weren't as many buffalo as I thought there would be, but there was enough to get by. I sure had heard a lot of stories about vast herds.

Margaret: Father, let's go to the top of that little hill, maybe we can see something from there. (They walk up hill.)

Joseph: Look at that river drainage. Are we going to follow that?

Erwin: We'll mention it to our guide. That might even be the trail. Look out west. That's where our new home will be. Maybe there will be more game there.

Margaret: I hear that there lots of ducks to be had in the winter. Someone told me that when a big flock flies overhead, it will blot the sun out for fifteen minutes.

Elizabeth: Look, deer tracks. (They gather around a "track.")

Irene: I have to admit, I'm glad they're not bear tracks. I want fresh meat but I'm not sure I want to take on a bear. The man we met last night said they have huge bears here in California.

Joseph: Let's follow them. (They follow tracks for a minute.)

Irene: Darn, they go right into this heavy brush.

Erwin: It's getting late. I think we'll have bacon for dinner again tonight. Let's head back.

Margaret: I sure hope we have better luck tomorrow.

(They leave to head back to camp.)

LETTERS HOME

SUMMARY: Students will pretend to be pioneers and write a realistic letter to a friend "back home." Letters will describe the hopes and hardships of their westward journey in the 1850s.

GOAL: To introduce students through personal narratives to life as pioneers traveling west in the 1850s

OBJECTIVES: By the end of the lesson, students (as role-playing pioneer children) will be able to describe in written form (1) why they are making the trip, (2) what they miss and what they look forward to, (3) their favorite things about the trip, and (4) the worst part of the journey.

GRADE LEVEL: Fourth, Fifth, and Seventh

TIME REQUIRED: Two 45 to 60 minute sessions

LOCATION: Classroom

MATERIALS: Overhead projector, several transparent sheets and markers, attached 1850s United States map, and pencil and paper for each student

SUBJECTS: CA History, Economics, Language Arts

KEY WORDS:

Fort - a way-station to rest, make repairs, send and receive mail, and purchase or barter for supplies. These were not Army forts, but commercial establishments.

Wagon - the main mode of transportation for the emigrants which was covered with canvas (painted for waterproofing) and was four by twelve by three feet deep. Wagons were purchased or built at home before departure. Iron straps reinforced stress points and iron rims on the wheels were used as tires.

Scurvy - disease caused by lack of fresh fruits and vegetables in the diet. Usually prevented by eating dried fruits, pickles, or vinegar along the trail. (It was not yet widely known that lack of vitamin C was the cause of scurvy.)

Cookstove - cast iron, box-shaped, wood burning stove carried in the wagons for heat and meal preparation.

Journals, diaries, letters - handwritten personal accounts of the daily lives of the westward migrants. Ink and paper were important items of trade at the forts, as many pioneers kept written records of their journeys.

BACKGROUND: This activity may be done in conjunction with the Emigrant West activity although it is not required.

A family's decision to join the westward migration in the 1850s meant leaving behind everything that was familiar, enduring a rugged, sometimes life-threatening journey, and starting a new life in a new land. Letters were the only link to the friends and family they had left behind.

Journals, diaries, and letters of the emigrants breathe life into the facts of their westward trek, a journey that changed the lands west of the Mississippi forever.

INSTRUCTIONAL SEQUENCE:

Before beginning the activity prepare the following: (1) make overhead transparency of 1850 United States map, (2) prepare paper copies of 1850 map for students, and (3) if desired, duplicate the letter-writing instructions to distribute to students for reference as they work.

Brainstorm with the class some of the reasons families decided to travel west. List on an overhead transparency: (1) open land (640 acres free from government versus \$200 for 160 acres), (2) depression of 1837 and drop in farm prices, (3) less crowded, less competition for jobs, (4) stories of rich soil, mild weather, riches just waiting to be made, (5) sense of adventure, and (6) criminals escaping the Law.

(1) Ask students to measure out the size of a wagon on the classroom floor (four feet wide by twelve feet long with three foot sides, and a canvas roof with pockets sewn inside for extra storage) and to imagine carrying all their supplies in that space. (2) Ask them to brainstorm what tools, foods, and supplies would be needed and to list their ideas on a transparency (duplicate for folders). (3) Add more items to the list such as: shovel, pick ax, saw, wagon repair parts, rope, strong knife, rifle, and ammunition. Lamps, fuel oil, candles, matches, iron cookstove, large kettle, skillet, teapot, butter churn, eating utensils, and water barrels. Clothes, cradle, chest of linens and blankets, medicines, and ground cloths. A bushel of dried fruit and 200 pounds of flour per person, bacon, molasses, vinegar (to fight scurvy), coffee, beans, rice, cornmeal, and jerky.

Project the 1850s map and ask students to locate a few of the main starting points for the travelers. Compare to recent United States map.

Discuss the following: (1) How the migrants got to the starting points (steamboat, paddle-wheeler, train, or spring wagon). (2) How they joined a group and hired a guide for the trip (leaders advertised through meetings and word of mouth, travelers had to consider cost, trustworthiness of the leader, and whether they could get along with other members of the group). (3) How they gathered and paid for the essential equipment and livestock (by selling their farms, homes, livestock, furniture, and businesses).

Ask students to locate the first forts the travelers might reach on the map. Use the map key to estimate distance and how many days it took to reach the first fort. (If the migrants had to cross a river or push the wagons up steep mountains, parties could travel only a few miles

a day. Across the plains, where water and feed for the livestock were scarce, the groups pushed ahead as fast as possible, covering as much as twenty miles in a day.)

Relate how the travelers relished their layover at a fort. They could hear news, bathe and do laundry, replenish food supplies, repair wagons, get medical help, rest their oxen, and send and receive letters.

Read aloud this list of items they could barter for or purchase at a fort from 1852 journals and letters: a new coat traded for 400 pounds of flour, a satin evening dress traded for a pair of used trail boots, a beaded purse for a cow, suspenders for 75 cents, meat for a week for two dollars, and baby shoes for one dollar.

To begin the letter-writing activity, read the following to the class: You are a child traveling west with your family. When you started the trip, you left behind your home, your school, and your friends. Now you are "laying over" at a fort for a few days. Write a letter to your best friend. Describe what your days are like, your chores, what you eat, and where you sleep at night. Tell your friend why your family wanted to make the journey. Include your feelings about the trip, what you're looking forward to, what you miss, and what frightens you. Include whether you believe the trip is worthwhile and if your friend's family should attempt it, too.

If desired, distribute copies of the instructions for student reference.

Allow time for student writing.

EXTENSION/ENRICHMENT: Art/Crafts - Stitch together a class quilt from scraps. Use it as a wall hanging or in a reading area. Make willow whistles and corn husk dolls, favorite toys of pioneer children. Recreation - Play a few of the games enjoyed by pioneer children, such as "Drop the Handkerchief," "Pointer's Bluff," or "Hunt the Ring."

ASSESSMENT: Use the student letters for assessment. Have the students share their letters in class. Discuss and evaluate the content of the letters in relation to the lesson objectives.

SETTLERS IN A NEW LAND

SUMMARY: Students work together in groups and role play pioneer emigrants establishing their new found homes out west in the 1850s.

GOAL: To introduce students to pioneer emigrant life in their new western homeland

OBJECTIVES: Students will plan and describe the following pioneer situations.

(1) Selecting and establishing a home site, (2) how they will make a living in their new found home, (3) rules needed for the establishment of a community, and (4) how they will preserve and protect the natural resources

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: 45 to 90 minutes depending on group

LOCATION: Various sites at Lassen Volcanic National Park

MATERIALS: Large writing paper, felt pens, easel to support pad, large heavy paper or cardboard, and dark felt pens or charcoal. Each group will need scratch paper, pencils, and a clipboard.

SUBJECTS: CA History, Social Science, Economics

KEY WORDS:

Natural Resources - often used for the benefit of people. All the naturally growing plants, wild game and other animal life, air, water, land, and minerals.

Community - group of people living and working in close proximity. Jobs and roles are usually interdependent with other community members.

Barter - an exchange of items or labor, instead of using money which was scarce in the early days of the country.

BACKGROUND: Between 1847 and 1849 some 8,000 emigrants were persuaded to follow Lassen's Trail to cross into California. They were discouraged by the wandering, rugged miles and Lassen's tendency to get lost. Rescue parties were their only salvation. Peter Lassen's dubious reputation as a trail blazer spread and the trail was seldom used after that.

Nobles' Trail, established in 1851, was easier and far more direct. The trail passed Cinder Cone, crossed Deer Creek, and then followed Lost Creek to pass by Manzanita Lake. Ruts from wagon wheels can still be seen near Cinder Cone.

Footsore and weary, emigrants on the Nobles' Trail were overwhelmed with the natural beauty surrounding them. The clear streams, lush forests, and plentiful game were all they had "heard tell about" and then some.

INSTRUCTIONAL SEQUENCE: This activity can be done at a number of locations in the park. Suggested locations include the Lily Pond trail, near the Loomis Museum, or the Manzanita Lake Picnic Area. Whatever site is selected, it is important to visit the site before bringing your class to the park. This will provide for better organization and success of the activity.

1. In class introduce the activity and explain to the students that they are part of a pioneer emigrant party who has finally made it to California and is about to establish a new settlement. There are a number of families settling here. Divide the students up into "family groups" of four or five students depending on the size of the class. Explain that they will be working as a family during this activity.

2. Make a list on the blackboard of the following things each group will need to plan in building their new life out west. Discuss the list with the class and have the students copy the list to use on the field trip.

Have them think about these things in class or at home before going on the field trip: (a) location of home site, (b) description of new home--inside and out, (c) what will the house be built of and how will they obtain building materials, (d) how will they get water, fuel for lamps and cooking, and food--grow, barter, buy, (e) how will they dispose of wastes, and (f) how will the livestock be cared for and be used.

3. Collect all the materials needed for the activity.

4. Bring the class to the park. Take some time when you arrive to explore the Loomis Museum if it is open.

5. Gather the class together in preparation for the activity at the site selected.

6. Set up the easel and pad.

7. Tell the students that as newly arrived pioneers, they have chosen to settle in this area. Ask them to brainstorm what factors make it a suitable location. List their ideas on the pad. (Suggestions: (a) near a river, a road, a town with supplies, (b) good soil, fresh water, shade, game, fish, lumber, and (c) deer skin, beaver fur, water for irrigation.)

8. Have the class divide into their family groups for the activity.

9. Explain that the family groups will each go out and find a home site in the area you have selected to use. Establish boundaries and make sure everyone is clear about their location. Make sure each group has a copy of the "planning list" they prepared in class. These are some things they need to think about and discuss as a family group in planning for their new life out west.

10. Remind students that they have a few items in their wagons to use. Ask them to brainstorm what those items might be and list on the pad.

11. Make sure each group has paper, pencils, and a clipboard.
12. Remind students of the park rules. Dismiss the groups and instruct them to meet back with you in fifteen minutes with their ideas.
13. While they are looking for their homesites and discussing their plans for their future, sketch a rough map of the area on the sheet of cardboard. Use dark felt pen or charcoal to look more authentic. Prop up your map on the easel.
14. As each group returns, ask them to draw their "homesite" on the map.
15. Ask groups to give a two to three minute presentation about what they have decided. Does everyone approve of all the homesites, or will there be problems? Ask the "community" to suggest improvements. Revise the map if needed.

NOTE: If you are running short of time, you may wish to finish the rest of the activity back in class.

16. Family groups will need a source of income. Ask students to brainstorm some ways a family can make a living in the new settlement. List on the pad. (Suggestions: provide a service, work in the saw mill at the next town, sell supplies to miners, be a laborer at valley farms, teach children in the settlement, provide medical help, carry mail.)
17. Ask each family group how they have decided to make a living. Call on one group at a time to write their occupation next to their "home" on the map.
18. Discuss the choices and whether or not the community could be self-sufficient.
19. Ask the class to plan how issues affecting the community will be decided? What rules are needed? Who will be in charge of enforcing the rules and deciding on punishment? Make notes on the large pad.
20. Read the following aloud, then discuss: "The cities you left behind were crowded, with few trees and overused streams. You have spent months traveling across parched deserts and rough mountains to reach this new land. You have chosen to settle in this area because of the natural beauty of the forest, the abundance of wildlife, and the clean water. How will you ensure that these resources are preserved and protected for your children and grandchildren?" Make notes on the large pad.
21. Ask each group to meet again. Working together, they will write a description of everything they have planned for their new homes, jobs, the health and welfare of their community, and how they will preserve and protect the natural resources. Allow ten to fifteen minutes; longer if needed.

EXTENSION/ENRICHMENT: History - Research the lives of Peter Lassen and William Nobles. Draw maps of the trails they developed. Compare the pros and cons of each trail. Develop a sense of the times by researching what events were occurring in the rest of the country during the 1850s. Language Arts -Print a newspaper for the new arrivals. Include articles on government, wars, economy, new states and boundaries changes, local announcements, society and fashion news, land and building materials advertisements, and a menu (with prices) from a new cafe. Cooking - Prepare a pot of vegetables and some biscuits in a Dutch Oven over a campfire.

ASSESSMENT: "Family group" and individual work from this activity provides the basis for assessment. The class can participate in self assessment by having each family group present their work to the class. The students will critique each group on the basis of how well they accomplished the objectives and planning list in No. 2 of the Instructional Sequence.

LASSEN VOLCANIC OFFICIAL MAP AND GUIDE

SUMMARY: Students will use a map with descriptive text to learn about Lassen Volcanic National Park. They will plan a visit based on specific details they learn from the map.

GOAL: To provide students with an introduction to Lassen Volcanic National Park.

OBJECTIVES: Students will use the park map to: (1) Develop an itinerary for a visit to the park, (2) List at least five interesting facts about the park, (3) Identify and describe at least three specific features found in Lassen Volcanic National Park.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: Two 45 to 60-minute periods

LOCATION: Classroom

MATERIALS: Copies of the “Lassen Volcanic National Park Official Map and Guide.” Maps can be requested from the park or downloaded from our official website. It is suggested that you have a copy of the map for each group of four or five students. Laminate the maps and reuse them. Paper for individual and/or group drawings and notes is also needed.

SUBJECTS: History, Science, Language Arts, Mathematics

KEY WORDS: Cultural History, Natural History, National Park Service, Landscape

BACKGROUND: The “map and guide” provides a concise introduction to the Park. Use of the guide encourages students to read and study maps and/or pictures, and builds their interest in Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Form groups of four or five. Using the “map and guide” have the groups read, discuss, and complete the Student Activity Page. After completion of the Activity Page, go over the answers in a group discussion.

EXTENSION/ENRICHMENT: (1) Pretend you are a tour guide trying to convince a group to take a tour of the Park. Write and present a sales pitch to your group or the class. You may want to use a model or picture of the Park when you give your speech. (2) Write a list and/or make a drawing of your ideas to improve the “map and guide” and send them to the Park Superintendent. Note: If your class has several plans or ideas, send them all in one package. (3) Design questions to ask park personnel when you visit or make a checklist of items you would like to draw and/or describe in your journals.

ASSESSMENT: Student work and presentations provide samples for assessment and inclusion in student portfolios. Each group could present completed Student Activity Pages to the class and these pages could be compared to quality criteria agreed upon by the class and teacher before and during the activity. The plan for the visit or suggestions for improving the “map and guide” also make good products for assessment. Engage the class in a discussion before beginning the actual work and define the parameters of a quality project.

Student Activity Page

1. Using the Official Map and Guide answer the following questions.
 - a. What are the names of the three largest lakes in the Park?
 - b. How many mountains in the Park are over 8,000 feet in elevation?
 - c. How many ranger stations are there in the Park?
 - d. What campgrounds are not next to a lake?
 - e. How many lakes does the Pacific Crest Trail go by?
 - f. What is the name of the highest mountain in the Park?
 - g. There are three unpaved roads into the Park. Where do they go to?
2. Being a national park, regulations, safety, and warnings about thermal areas are important. List three important rules you should follow while visiting Lassen Volcanic National Park.
3. Plan a visit to the Park with your group. Write down five places you would like to visit, explain what you plan to do at each one, and what route you will take to get to each one.
4. List the names of four famous people that were part of the history of the Lassen area.
5. Lassen Volcanic National Park has been set aside to preserve a place having natural, cultural, recreational, and historical features that make it worthy of saving for future generations. What are the features that make this Park a special place?
6. List five interesting facts you have learned about the Park and its volcanic history.
7. If you were redesigning the “Lassen Volcanic National Park Official Map and Guide,” how would you make it even better?

Note and Observations

IT'S A GREAT IDEA

SUMMARY: Students will be introduced to the history of the National Park System and develop a management plan for a new national park.

GOAL: To provide students with an introduction about how a national park is established and developed.

OBJECTIVES: Students will (1) describe in writing how the National Park System was established (2) Develop a management plan for a new National Park.

GRADE LEVEL: Sixth through twelfth

TIME REQUIRED: Minimum of three 45 to 60-minute periods

LOCATION: Classroom

MATERIALS: Two-page Historical Brief - one per student. Student Activity Page - one per group. Map of Volcano National Park - one per group.

SUBJECTS: History/Social Science, Language Arts, Visual and Performing Arts

KEY WORDS: Natural and Cultural Resources, Conservation, Preservation, National Park, Development

BACKGROUND: The history of the National Park System is a fascinating study of how our political system works. The creation of national parks in the United States is a true extension of the ideals of democracy at work, the government being the agent for all people to live in a way conducive to promoting life, liberty, and the pursuit of happiness. This is an excellent introduction for students to the implementation of the ideals expressed in the Declaration of Independence and the Constitution.

Before the idea of national parks came to be, wilderness areas were viewed as places to be tamed and used for profit. The first person to propose a national park was artist George Catlin, who is best known for his paintings of American Indians. Other well known people of the 1800s, mostly authors and artists, gave romantic portrayals of America's wilderness that supported establishment of national parks. Included among these people are James Fenimore Cooper, Henry David Thoreau, Thomas Cole, and John Muir.

A two-page Historical Brief based on the book, The National Parks: Shaping the System (Mackintosh, Barry, 1991, Library of Congress), is provided. It has information about the background and philosophy that have led to the development of the National Park Service. The questions that accompany this activity are complex and require that students have time for individual reflection, group discussion, whole class discussion, research, and summation of their

own thoughts after working on answers. This is a purposeful departure from simple content questions and answers toward a thinking, meaning-centered curriculum. The teacher's role is to pose complex questions, to provide time and a variety of grouping strategies for working on answers, to facilitate the search for additional information and resources (using libraries, people, and computer networks as appropriate and available), and to model life-long learning as he/she becomes a partner with students to learn as much as possible about one of our greatest treasures, our National Park System.

INSTRUCTIONAL SEQUENCE: This activity is best done in three 45-minute segments: (1) Reading, discussing, and answering the questions pertaining to the historical brief; (2) student development of a park management plan for Volcano National Park; and (3) management plan presentations by students.

Divide the class into groups of three to four students. Make sure that groups are heterogeneously grouped according to reading ability. If reading is problematic, one student per group could be the reader or the teacher could read the selection to the class. All students should have a copy of the written materials in hand so they can follow along and refer to materials when they are answering questions and doing activities. Begin by reading or having students read the Historical Brief. Discuss the information with the students. Students in small groups should read and discuss the questions. Each student will write his/her own answers. After the students have answered the questions, discuss their answers as a class. Next, each group will read the Student Activity Page. Using this information, each group will work together and write their plan for the new park.

EXTENSION/ENRICHMENT: (1) Research the artists or writers of the 1800s who influenced the way people thought about America's wilderness and parks, thus promoting the establishment of the National Park System. Learn more about this person and be prepared to share it with the class. (2) Many different lands fall under the jurisdiction of the National Park Service including national parks, national historic sites, national recreation areas, and national monuments. Choose one of these types of Park Service units and learn more about it. Be prepared to share what you learn with the class.

ASSESSMENT: Student work and presentations provide samples for assessment. For instance, when students give their presentation of their park management plan, does the plan show evidence of understanding the need to preserve and protect park resources while allowing visitor access? Does the plan reflect the mission and goals of the National Park Service? Written, visual, and oral presentations are all parts of a quality product and should be considered in the assessment process.

Historical Brief

The idea of preserving places in America as national parks was first discussed by artists, writers, and visionary citizens who wanted to see special places saved for all time and for all people to enjoy. John Muir was one of these people. He studied and traveled in wild places all over the United States and wrote about his experiences. His writings about a beautiful valley in California's Sierra Nevada mountains with sheer granite rock faces reaching heights of 4,000 feet, cascading waterfalls, and numerous meadows, flowers, and huge trees, introduced Yosemite to the world. In 1864 Congress designated Yosemite Valley and the nearby Mariposa grove of giant sequoia trees as a state preserve "upon the express conditions that the premises shall be held for public use, resort and recreation, shall be held inalienable for all time."

Between 1869 and 1871 trappers and explorers told amazing stories about an area called Yellowstone. Great geysers shot hot water out of the ground. Mudpots and hot springs gurgled and steamed. Elk, grizzly bears, wolves, and other wildlife were abundant on the rich land bounded by beautiful mountains. Some of the people who visited Yellowstone and saw its geologic wonders suggested that the area be preserved for public use. After much debate, Congress passed the Yellowstone Bill and on March 1, 1872 President Grant signed the bill making Yellowstone the first national park. It was "dedicated and set apart as a public park for the benefit and enjoyment of the people." At that time no money was set aside to take care of it. It was a park without caretakers. In 1886 the United States Cavalry began a 30-year span of army control of Yellowstone in an effort to protect it. As the troops rode into the Park, they passed wagonloads of logs being carted out. They encountered hunters camped by the rivers and saw tourists bringing out mineral specimens they knocked off geyser and hot spring formations. With no one to take care of the Park, it would not survive in its natural state. So, these early years depended on the military to protect our first national park.

National parks are established by acts (laws) of Congress. In the next 40 years, the national park idea sprang to life in America. With the establishment of Yellowstone as a national park, Congress and the American people felt a desire to protect more of America's "special places" as national parks. In 1890 Yosemite and Sequoia became national parks. Throughout the west many other beautiful places were made national parks by Congress. Mount Rainier, Crater Lake, Rocky Mountain, and Glacier National Parks were established. By 1916 the United States government oversaw 14 national parks, 21 national monuments, and two historic reservations. Management of these public areas was difficult because there was no single agency to take care of these national treasures.

It became clear that the national parks needed a single organization to administer and protect them. On August 25, 1916 legislation was signed that created the National Park Service "to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." This new agency obtained its first money from Congress and prepared its first park policies to provide a purpose and methods for managing the national parks in order to meet its dual mission of preserving the parks in their natural state and providing for their enjoyment by the public. These national treasures were now more than just a collection of parks; they were now part of the National Park System managed by the National Park Service

The National Park Service was immediately faced with the challenge of wise park management and stewardship. This meant decisions had to be carefully made about where to build roads, trails, visitor centers, campgrounds, and other visitor service facilities. It was not an easy task to protect the parks and at the same time provide for public use and enjoyment.

Through the 1920s most national parks were in the western states where large areas of public land remained. If the National Park Service was to benefit more people, it would have to expand eastward where most of the population lived. Since most land in the east was privately owned, this provided new challenges. Congress said that parks in the east could be established but the land must be donated. John D. Rockefeller, Jr. was instrumental in providing funds for the purchase of lands in areas which are now the Great Smoky Mountains, Acadia, and Shenandoah National Parks. During the next decade, the National Park Service began to acquire and manage national historic parks in the east including Lincoln Memorial, Thomas Jefferson Memorial, and Gettysburg National Military Park. This expanded the view of parks, allowing cultural and historical places worthy of protection to be added which created a better-rounded National Park System.

The number and types of units in the National Park System has continued to grow, as well as the kinds of units. Currently there are over 390 units in the system. When new units are established, careful planning has to be made to balance development for people and preservation of the natural and cultural resources. Good management requires well thought out decisions.

Questions

1. In the late 1800s, the United States government had a terrible time managing the national parks. Why?
2. What are some of the things that happened that helped protect our parks and create a National Park System?
3. When Congress established the National Park Service in 1916, the purpose was “to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.” What does this mean?
4. Why do you think the National Park System is among America’s proudest and best loved places?

Student Activity Page

The first policies of the National Park System required that the parks be preserved in their natural state or for cultural/historical purposes and that enjoyment of the parks by the public be provided. This vision still guides the work of the National Park Service. Pretend that Volcano National Park has just been established. It is in the mountains (at elevations of 6,000 to 10,000 feet) with many beautiful lakes and streams. It is a land of volcanoes and has areas where hot springs bubble to the surface. It has a pioneer emigrant trail, historic settler buildings, and American Indian village sites. This new national park has no roads or visitor facilities and is within a two- hour drive of a major city. Your group has been given the task of deciding on the development and management of the Park. Your group must decide how to protect park resources (both natural and cultural) and still allow for visitor use. The decisions you make will be the Volcano National Park Management Plan. Include and justify any development that will be built. Explain how these activities will allow for enjoyment of the park's special features while preserving and protecting the Park for future generations. Be prepared to present your plan to the class.

Using the park map, decide where the road through the Park should go. Once you decide where to put the road, draw it on the map with a pencil. If you are sure of your decision about the road, trace your route with an ink pen.

You need to next decide which of the following development options are necessary and needed in the Park. Some of these may not be needed inside the Park and may be better placed outside of it. Remember to not disturb or place developments too close to natural or cultural sites such as Indian or pioneer sites, lakes, creeks, thermal areas, or volcanoes.

The park development options are numbered. Mark the number of each option your group selects in the place you want it to be on the map. Your choices are your plan for the Park. You may choose some of the development options more than once if your group thinks that they are needed in more than one location. Be ready to explain to the rest of the class why you made the decisions you did.

Park Development Options

1. Hotel
2. Campground
3. Picnic area
4. Gas station
5. Visitor center
6. Ranger station
7. Museum
8. Gift shop
9. Camper store
10. Nature trail
11. Bank
12. Restaurant
13. National park office

Things to consider when developing your park plan:

1. Areas off limits to people
2. Safety of visitors
3. Protection of wildlife habitat
4. Protection of lakes and streams
5. Protection of cultural and historical sites

Notes and Observations

THE AMERICAN WAY

SUMMARY: Students will participate in a “town meeting” where they portray various individuals who were involved in the establishment and early development of Lassen Volcanic National Park.

GOAL: For students to develop an understanding of how the process of public debate and free speech contribute to the establishment of a national park.

OBJECTIVES: Students will be able to (1) name at least two individuals who were instrumental in establishing and developing Lassen Volcanic National Park, (2) describe two reasons why the Park was established, and (3) compare their personal and modern views about land use with historical viewpoints.

GRADE LEVEL: Fifth through twelfth

TIME REQUIRED: One or two 45-minute periods

LOCATION: Classroom

MATERIALS: Character Cards, pencils, paper

SUBJECTS: History, Social Science, Language Art, Drama

KEY WORDS: Establish, Develop, Conservation, Preservation, Debate

BACKGROUND: On May 6, 1907 President Theodore R. Roosevelt established Cinder Cone and Lassen Peak National Monuments. Many people had worked hard for this goal, and yet the work was just beginning. Since then, more land was acquired, Lassen Peak erupted, and our country’s 13th national park, Lassen Volcanic, was established on August 9, 1916. As with the establishment of any national park, people had to be convinced of the area’s value.

In this activity, students will portray historical individuals who had an interest in the Lassen area. Although some of these people lived at different times, they all had an effect on the final decision. A brief character description and other pertinent information is found on each Character Card. If time permits, students could research their characters more thoroughly.

This is not a formal debate, but a “town meeting” where each viewpoint is shared. This activity is great fun if each student tries to impersonate his/her character. Give them a few minutes to think about the voice that they might want to use. You might want to make some props available. Each student’s character should state and explain his/her viewpoint. The committee members will make the final decision. The teacher or one of the students can act as judge.

There seemed to be more people for rather than against the formation of Lassen Volcanic National Park. Small groups of people were against it but they were not well organized or represented.

Interesting, detailed, historical information can be found in: Footprints in Time, A History of Lassen Volcanic National Park by Douglas H. Strong, “History Notes” in the reference section or park’s teacher packet, and Eruptions of Lassen Peak by B. F. Loomis which is both interesting and educational and includes personal accounts of the eruptions as well as the remarkable photographs taken by its author.

INSTRUCTIONAL SEQUENCE:

1. Explain that there will be a meeting to discuss the fate of the land and features surrounding Lassen Peak. Some students will receive Character Cards and portray their character’s viewpoints and concerns. Other students will be on the “National Park Committee” and will listen to all the concerns. They then must decide whether to establish a new park called Lassen Volcanic National Park, keep the two small monuments as they are, or have the area revert back to national forest.
2. Pass out the Character Cards. Have the students read the information and decide how they want to portray their character. Remind students that they are representing their character’s viewpoint, not their own.
3. Have the rest of the class, the “National Park Committee,” set up the “meeting hall.” Chairs for the committee should be in a semicircle on one side of the front of the room. Set a podium in front of the committee. Place enough chairs for the waiting characters facing the front.
4. Call the meeting to order. As each character is introduced, he/she comes to the podium and shares concerns and viewpoints. Characters get about two minutes each and should state their name, time they lived in the area, their connection with the area, what their job is, why they think a park should or should not be established, and/or what alternative they support. Remind the students that they will be trying to convince the committee to vote for the alternative of their characters’ choices.
5. After all the views have been represented, the committee should openly discuss all the alternatives and then vote. The alternatives can include, but are not limited to: full national park designation, keep status the same as separate national monuments, or revert back to national forest.
6. After the committee votes, open the discussion up to the whole class. Would any have voted differently? Why or why not?
7. Have each student pick one of the characters and write a paragraph on how that person might have felt about establishing Lassen Volcanic National Park.

EXTENSION/ENRICHMENT:

1. If Lassen Volcanic National Park had not been established in 1916, do you think we would establish it as a national park today? Brainstorm who the interested parties might be. Hold another meeting. Who would be for establishing a park? Who would be against? Why/why not? Who would be at the meeting? Who would be responsible for the final decision? How would you vote? How would your parents? Why?

2. Pick a current local issue such as making Mt. Shasta a national park. Decide which interests should be represented. Hold a meeting. Debate and decide the issue's fate.
3. Read some of the personal experiences in Eruptions of Lassen Peak by B.F. Loomis.
4. Research the characters more thoroughly.

ASSESSMENT: Have the students name three people important in the establishment and early development of Lassen Volcanic National Park, list two reasons why the Park was established, and determine how they would have voted at the meeting if they were alive when Lassen Volcanic National Park was being established. Explain why.

Character Cards

Photocopy for student use.

1. **Louis A Barrett, supervisor of Lassen National Forest from 1905 to 1910.** During this time, Barrett estimated that he walked about 3,500 miles and rode 10,000 miles in the Lassen area. He put into practice the doctrine of multiple use but later reflected that this had helped destroy much of the area's original beauty. He filed a report to the government recommending several points of interest be given national monument status which would protect them from placer and other mining, mineral claims, logging interests, and ranching. Louis Barrett favored national monument over national park status because the "natural curiosities" were small and scattered and the land in between could be used for other purposes. The U.S. Forest Service would retain control instead of handing it over to the Department of Interior.
2. **The ghost of Ishi, representative of the Yahi and Yana tribes who lived in the foothills west of Lassen Peak.** During the hot summers, the Yahi and Yana Native American tribes lived in temporary camps on the cooler slopes of Lassen. Life was not easy even before the settlers came. Their staple food was acorns, supplemented by wild game, roots, berries, seeds, and leafy plants. Their numbers dropped drastically with the coming of settlers due to malaria and other diseases. Settlers moved onto their land and wanted them off of it. Many Indians were hunted down and killed. Some survivors were moved to reservations only to die. Most, if not all, of the Yahi were exterminated by the late 1860s. By 1911 the sole survivor of the Yahi, Ishi, was starving and came out to the town of Oroville. Ishi had been hunted by settlers and had watched all of his family and friends die. Ishi shared some of his culture with us before dying of tuberculosis in 1916. He would probably be glad that "Waganupa" (Lassen Peak) is preserved and held in some respect.
3. **William H. Nobles, artisan and prospector.** He discovered what was probably the easiest trail into California. Nobles sought fame and fortune with his trail but it was not realized during his lifetime. Most emigrants continued to use the more publicized routes farther south. He hoped the trans-continental railroad would go via his route but instead it went over Donner Pass. Part of his trail is preserved in the present day Lassen Volcanic National Park. William Nobles probably would have been pleased to see a national park made that helped commemorate the trail he found.

4. **Joseph Silas Diller, veteran geologist of the U.S. Geological Survey.** He researched the Lassen area for 40 years between 1883 and 1923. Diller realized that Lassen was actually part of the Cascade Range rather than the Sierra Nevada and valued the beauty of this unique geological area. He was instrumental in mapping this area and added greatly to the geological knowledge of the Lassen region. He visited Lassen after eruptions and hiked up Lassen Peak and peered into the smoking new crater. He also viewed the Devastated Area. Diller's Geologic Atlas was often cited to support the park proposal. Joseph Diller supported Dittmar's proposal to establish a park.

5. **Helen Tanner Brodt, first Caucasian woman known to climb to the top of Lassen Peak.** She ascended the peak on August 28, 1864 with her husband, Aurelius Brodt and Major P.B. Reading. They found a crater near the top "sending up vast clouds of sulfurous steam, and making a deafening roar, similar to an immense steam-engine blowing off steam." The newspaper reported that "they had made the trip to Lassen for the purpose of sketching that beautiful mountain." They also found a beautiful small lake, which Mr. Reading named after Helen. She enjoyed the beauty, solitude, and geological wonders of the area.

6. **Major P.B. Reading, rancher, founding father of Shasta County.** He filed a mining claim on what is now Bumpass Hell in 1854 and did other prospecting in the nearby foothills. Reading surveyed Nobles Pass for a possible railroad route, which ended up going through Donner Pass instead. Not much mining was done within the present day park boundaries except at the Sulphur Works, as no large paying deposits of anything were found. Major Reading became the first settler in Shasta County and was a respected citizen. He made many trips to the Lassen area to hike and enjoy its beauty.

7. **Ponderosa Pine Tree.** This tree lived in Lassen for 300 years and has witnessed the coming of settlers. It would like its youngsters to live to a ripe old age and become snags, homes for woodpeckers and other animals to take refuge in. It witnessed logging outside the park boundaries and the accompanying change of scenery and degradation of the environment. This tree was glad that not much logging was done in Lassen due to its general inaccessibility and poor quality of timber. It witnessed the eruptions and watched close friends being blown down in the Devastated Area. This pine tree would like to keep the forest in Lassen intact for the benefit of all wildlife and especially likes small children to walk underneath and look up with admiration.

8. **Mr. Jessen, stockman.** Most of the land now included in the park boundaries was unsuitable for year-round habitation and would not sustain a family. It was good for summer pasture for a few head of cattle. Only about 15 stockmen with 30 to 200 head apiece summered in the area. Jessen's place was destroyed in 1915 by the eruptions and was part of the Devastated Area. When B.F. Loomis saw the Jessen place after the eruption, he said, "The Jessen place was once a fertile meadow, but now it is a waste of land, with not a vestige of buildings or fences to show where the place used to be." Jessen figures the area is a total loss for grazing because of the volcanic activity, but that the land is valuable in other ways.

9. **Benjamin F. Loomis, lumberman, hotel operator, amateur naturalist, and photographer.** He was a long time area resident best known for his incredible photographs of the 1914 to 1917 eruptions of Lassen Peak. Loomis spent lots of time hiking and photographing the Lassen area and wrote numerous newspaper articles about the eruptions, which brought national attention to Lassen. He wrote Eruptions of Lassen Peak and built a stone museum at Manzanita Lake in memory of his only daughter, Mae, who died of influenza. The museum and 40 acres of land were later donated to the National Park Service and included in the Park. B.F. Loomis strongly supported establishment of the Park.

10. **Arthur L. Conard, progressive businessman.** He was an organizer and president of the Lassen Park Development Association. Conard exerted strong leadership in the establishment of Lassen Volcanic National Park and owned 40 acres near Mineral where he spent relaxing summers. He strongly believed that the area was unique and significant as well as beautiful. After the Park was established on August 9, 1916, Arthur Conard promoted interest in the new park by citing its great recreational potential.

11. **Congressman John E. Raker, Representative of the State of California from Susanville for 15 years.** Raker spent part of his childhood near Lassen and vacationed in Drakesbad. He introduced several bills to establish Lassen as a national park. When Lassen Peak erupted, much positive support was generated; his bill was finally successful and was approved by President Wilson in 1916. Congressman Raker continued to be the Park's main spokesperson in Congress until his death in 1926.

12. **Michael E. Dittmar, journalist who started the Redding Record Searchlight, among other papers.** He was interested in Lassen before the eruptions and saw the eruptions as a good way to get support for the Park. Dittmar lobbied on behalf of Redding and Shasta County for the establishment of a national park. He wrote many good descriptions of the scenic beauty of the area and sent in many photos of the eruptions. Michael Dittmar worked on ways to promote interest in the new national park by giving illustrated lectures and worked on the idea of a loop road connecting points of scenic beauty and scientific significance.
13. **Ima Stockman, imaginary stockman.** He grazed cattle in the park boundaries in 1919. Stockman wanted to abolish the Park because grazing brought more revenue than the tourist trade. He thought more people visited the surrounding national forest than the Park and had strong opinions but was outnumbered by people who supported the Park. Ima Stockman wanted the area to be national forest so grazing could be continued.
14. **Milton Supan, son of Dr. Mathias Supan who claimed the Sulphur Works as a mine.** He realized the development value of his property with the loop highway going through it and constructed a lunchroom and gas station. He wanted to continue developing his property for tourists and financial gain. Milton Supan supported the Park but wanted to continue to own his private property within it.
15. **Lance Graham, park visitor.** Graham was born and raised within sight of Lassen Peak. On June 14, 1914 he and two others climbed the peak to look at the newly formed crater. They were at the rim when the eruption began. They ran down as fast as they could but Graham was hit by a flying rock and left for dead. Luckily the rocks and ashes were cool. If they had been hot, all would have been killed. Lance Graham was found alive, and rescued after the eruption was over. He was filled with awe and respect for Lassen Peak!
16. **Atsugewi Tribal Leader.** The Atsugewi (Aht-zsu-GAY-wee) is an Indian tribe that lives northeast of Lassen Peak along Hat Creek and in Hat Creek Valley. The tribe had traditionally used the northwestern portion of the proposed park during summer months for hunting, fishing, and gathering of various plants. For thousands of years this land had provided the tribe with all it needed to survive. The lakes, streams, meadows, and forests had many good memories and important meaning to the tribe. If making this area a national park would result in the land being protected, preserved, and respected by those who would use it, then the Atsugewis would favor making this beautiful place a national park.

17. **Canada Goose, a regular summer visitor to Manzanita Lake.** He enjoys the quiet, unpolluted lakes in the area surrounding Lassen Peak. This goose builds nests on the shore of many of the lakes and raises his family there. Making Lassen a national park would mean protection from hunting for all the wildlife living in the Park.

18. **Forrest Cutterburg, imaginary prospective lumberman.** He thinks there might be some valuable timber in the Lassen area. Forrest Cutterburg thinks that only the peak and Cinder Cone should be managed as national monuments and the rest as national forest. This would allow logging in all other areas not made into a national park.

THIS SPECIAL PLACE

SUMMARY: Students will explore a site, feature, or area in the park and make a list of details that make that site special.

GOAL: For students to develop their ability to notice details that make a national park a special place

OBJECTIVES: Students will (1) be able to generate a list of what makes a specific site in the park special and (2) be able to explain two reasons why the things chosen make the park special.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: 45 to 60 minutes

LOCATION: Any site or trail in Lassen Volcanic National Park

MATERIALS: Students will need pencil or pen, paper, and something to write on (clipboard).

SUBJECTS: Science, Language Arts, History/Social Science

KEY WORDS: Outdoor Classroom, National Park, Special

BACKGROUND: Throughout the history of the National Park System people have been inspired by special places that they have felt should be protected as national parks. Lassen Park was established because of its unique volcanic features. Years after it was established, people have continued to discover other attributes that make Lassen a special place worthy of national park status. Each person that visits Lassen remembers something special about it. This activity provides students with the opportunity to draw on their own discoveries and experiences and to share why they feel Lassen is a special place. This activity complements any subject matter or curriculum planned for the field trip. It provides focus and opportunities for emphasizing the purpose and meaning of the visit.

INSTRUCTIONAL SEQUENCE: Discuss the activity in class before you visit. Be sure students clearly understand the task, materials needed (questions, pencil, something to write answers on, and a place to keep all these things), and what is expected as far as quality of work.

Be sure groups/individuals can spread out enough so they have space/quiet for completing this task. Decide on space boundaries and time limits and have students write them at the top of their papers before they begin so it will be clear that everyone knows the parameters. Then explain that you want the students to make a list of things at the site that they think are special (plants, animals, mountains, streams, sounds, colors, etc.). They need to also explain why they think each item is special. They need to be specific in their answers. Back in class, have the students share and compare their lists. As a class discuss and make a list of things that make Lassen a special place.

EXTENSION/ENRICHMENT: (1) Formulate questions about the site for further discussion or

research with your class. (2) Have the students write a story using their list from the field trip. (3) Have the students make a list of what is special at school, home, or community. Compare this list to the list they made at Lassen Park. (4) Have the students pretend that the site is going to be their classroom for a full school year. From their list, have them write questions about things they do not completely understand or want to study more. (5) Considering all the subjects studied in school (such as math, PE, science, history, etc.), which ones could Lassen Park provide as a well-rounded outdoor classroom? Using the questions from their lists, ask the students to list the subjects that could be incorporated into each question.

ASSESSMENT: Student notes and lists from this activity provide samples for assessment and inclusion in portfolios. A thorough assessment could be provided by having the students write a story about the site using their notes from their on-site visit; it could be titled "This Special Place" or whatever they choose. Another effective way to incorporate this activity into the assessment process is to have the whole class make a list of what they saw, experienced, and learned. Then each student should use this brainstorm list to make a final entry in his/her journal summarizing the trip. Some of the ideas in the enrichment section above may also prove to be effective assessment tools.

A PLACE FOR ALL SEASONS

SUMMARY: Students will record their observations of seasonal changes in the park and discuss why Lassen Volcanic National Park is important.

GOAL: To develop student awareness and understanding of the importance of a national park as a place for all seasons.

OBJECTIVES: Students will 1. Be able to name at least two reasons why Lassen Volcanic National Park is important in all seasons. 2. Be able to share at least two observations of changes in seasons they have noticed.

GRADE LEVEL: Third through Twelve.

TIME REQUIRED: 45-60 minutes in the park and 45 minutes in the classroom.

LOCATION: Any site or trail in Lassen Volcanic National Park

MATERIALS NEEDED: The student will need a copy of the Student Activity Page, pencil or pen, something hard to write on, and lined paper.

SUBJECTS COVERED: Science, Language Arts

KEY WORDS: National Park, environment, habitat

RELATED CONCEPTS: •Natural environments change with the seasons.

BACKGROUND: Lassen like all National Parks has many important values. It is not just a seasonal recreation area. It has sustainable values year round, for all seasons. Each season has its influence on the park's biological and physical characteristics. All are interrelated and important affecting not only what is in the park, but many things outside the park as well. For example, Lassen is an important watershed. The amount of snow that falls in the park affects many downstream water users. Lassen is a seasonal home for many wildlife species such as deer and song birds. It is where they raise their young. Consequently, Lassen provides critical habitat for maintaining some of Earth's rich biological diversity. Lassen Volcanic National Park is also an outdoor classroom, a historical and cultural site, and one of America's enduring treasures. The park is an important place in all seasons.

INSTRUCTIONAL SEQUENCE: As with all field trips student enthusiasm will be greatly enhanced by prior learning. Provide the students with an introduction to the park. Use park maps, books, and/or video's to share and discuss information about the park. Ask the students why they think national parks such as Lassen are important. Make a class list from their answers.

This activity is divided into two parts. The first part is the field trip portion. The student activity page is used on the field trip. The second part is the classroom post field trip follow up. The questions at the end of the assessment are to be done back in class.

Prior to the actual visit trip to the park explain to the students that during their visit they are going to be scientists studying this particular season. They will be answering questions provided for them on a student activity sheet. Explain to the students that they will be working in pairs or individually (Teachers Choice). At the park they are to walk on a park trail or sit in a designated area to observe and answer the questions on their study sheets. Be sure groups/individuals can spread out so they have space/quiet for completing their task. Decide on space boundaries and time limits so it will be clear that everyone knows the parameters.

ENRICHMENT/EXTENSION ACTIVITIES: (1) Have the students draw a picture based on their park visit. Make sure that they include as many details as they can. (2) Have the students write a seasonal poem that captures the uniqueness of this place during this season.

ASSESSMENT: Have the students answer the Student Questions back in class. Discuss their answers. Have the students develop additional questions about the park based on what they observed and recorded on the field trip. Use all of their student work from this activity for assessment. An additional assessment would be to have students make presentations on their experiences to other classes and/or community groups. For these presentations they may need to make visuals about their experiences in the park.

Classroom Activity

Student Questions

1. Why are the forests in the park important all year?
2. Can the things you observed on the field trip be seen everyday of the year? Why?
3. Why is this season important to the park?
4. What other time of year would you like to visit the park? Why?
5. Lassen Volcanic National Park is an outdoor classroom. From your field observations put a circle around those subjects which you could study here during any season. Science, Art, Math, History, PE, Reading, and/or Writing
6. How might the changes in the seasons at Lassen affect you at home?
7. Explain what makes Lassen Volcanic National Park a special place for all seasons?
8. If people can't visit Lassen Park should it still be preserved? Why?
9. The following words describe different park values. Using your student activity page write one or more of these words next to each of the numbers. Ecology, Geology, History, Art, Fresh Air, People, Watershed, Classroom, Peaceful.

A PLACE FOR ALL SEASONS Student Activity Page

You are a park scientist who is trained to notice details and make accurate observations. On a separate sheet of paper answer the following questions and do the activities described below. You may wish to take notes on your observations to help in answering some of the questions.

1. Name of trail _____
Date _____
Time _____
Season _____

2. Describe what the weather is like today in as much detail as possible.
3. Write down all the different colors you see on your walk. What colors are found only during this season?
4. Are there any insects out? Are they in the water, in the air, or on the ground? If your answer is no, why aren't there any insects out?
5. Do you see any birds or mammals? Keep track of how many different kinds you see of each during your walk. Do you think they stay here all year or live here only during certain seasons?
6. Is there snow on the mountains? Where does the melted snow go?
7. Can you see any changes in the forest that might of happened today? This season? This Year?
8. Find a place to sit down and be quiet for 5 minutes. Record all the sounds that you hear.

9. Describe the most beautiful thing you've seen today.
10. Describe the most amazing or unique thing you've seen today.

NATIONAL PARKS FOR THE 21ST CENTURY

SUMMARY: Students will write and develop solutions to current and projected problems in a national park.

GOAL: For students to develop an understanding of the complexity of managing a national park

OBJECTIVES: Students will (1) develop an understanding of key objectives recommended to guide the management of the National Park System in the 21st century and (2) apply their understanding of these objectives to solve current and projected park management problems.

GRADE LEVEL: Sixth through twelfth

TIME REQUIRED: This activity is divided into four parts. Each part takes 45 to 60 minutes, depending on grade level and length of class discussion. Parts I and II may be taught as separate lessons providing students with a introduction to national park management.

LOCATION: Classroom

MATERIALS: Background Pages and Park Management Team Pages - one per student. Orientation Page - for teacher use. Park Problem Pages - one divisional set per student group. Any resources on national parks in general or specific national park units will enrich this activity.

SUBJECTS: Social Science, Language Arts, Mathematics, Science

KEY WORDS: Legislation, Stewardship, Objectives, Natural and Cultural Resources, Management, Interpretation, Administration, Maintenance, Budget, Artifact

BACKGROUND: Before doing this activity, carefully read over the background pages which are based on the book, National Parks for the 21st Century, The Vail Agenda, Library of Congress Card Number: 92-60471, National Park Service Document Number: D-726, International Standard Book Number: 0-9603410-7-2. Also read the Park Management Team Pages. The full four-part activity correlates well with another activity in the "National Park Idea" curriculum titled "National Park System, The Way It Works."

INSTRUCTIONAL SEQUENCE:

Part I. As a class read and discuss the Background Pages and answer the three questions.

Part II. Read the Park Management Team Pages and as a class discuss how a national park is managed. Ask the students what division of park management they would like to work in and why.

Part III. Divide your students into five groups. Explain that each group will play the role of a working division in the National Park Service. Read the Park Orientation Page to the class. Pass out the Park Problem Pages. There is a Park Problem Page for each group (division) to focus its work. Each group discusses and writes solutions for its division's park problems.

Part IV. These written solutions will guide a class oral presentation that serves as the culmination of this lesson. Each division should be given five to ten minutes to share its problems and solutions. Make sure that groups are heterogeneously grouped according to reading ability. If reading is problematic, one student per group could be the reader or the teacher could read the selection to the class. All students should have a copy of the written materials in hand so they can follow along and refer to materials when they are answering questions and doing activities.

Some of the words in the Background Pages may be new to students. These include: Legislation, Promote, Regulate, Conform, Conserve, Unimpaired, Mission, Objectives, Resource, Stewardship, Adjacent, Access, Diverse, Unique, Attributes, Interpretation, and Complex. If some or all of these words are new to your students, list them on the board and have the students find and mark the words on their papers. Then the whole class or small groups can read them in context to develop definitions. Students may refer to this list as they read and discuss the activity. Each student should write his/her own answers.

EXTENSION/ENRICHMENT: (1) Students could hold a meeting and write their own "Vail Agenda" for the future of the national parks, perhaps giving it the name of their school or town. (2) Students could create a model for any part of the "Vail Agenda." For instance, they could plan (and implement, if possible) an educational program for the national park nearest them in which older students teach younger students about their park. (3) With your class discuss a situation (either a real one or one that could happen) that involves resource stewardship and protection in a national park. Write and/or be prepared to act out the story of the situation.

ASSESSMENT: Student work and presentations provide samples for assessment and inclusion in student portfolios. When each "division" of the national park presents its solutions to the class, the presentation and products to support the presentation can be used for assessment of each group or individual.

BACKGROUND

The original mission of the National Park Service was defined in 1916 by the legislation which created it:

"The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Though this mission remains the same today, more specific guidelines were needed to determine the current condition of the Park Service and to provide a future vision.

In 1991, a gathering of people from both government and private groups met to develop a written plan for the future of the national parks of the United States. In this written plan, the authors said:

"The National Park Service is charged with the management of the nation's most precious natural and cultural resources. These resources are inextricably woven into our national heritage, and they provide citizens the world over with invaluable opportunities for recreation, appreciation of beauty, historical reflection, cultural enrichment, and environmental education. It is the responsibility of those involved in park management and policy formulation to ensure the protection of the resources managed by the National Park Service. Yet, fulfilling this enormous responsibility is neither easy nor free of controversy."

The written plan that resulted from this work is called National Parks for the 21st Century, the Vail Agenda. In this book, the following four objectives help form the vision for the National Park Service:

Objective 1 - Resource Stewardship and Protection. The primary responsibility of the National Park Service must be protection of the park resources. Preserving and protecting the resources of the parks requires many different people working together. This means not only national park employees, but also property owners adjacent to the park, other people near the park, and sometimes with people far away. Additionally, visitor activities that might be appropriate at one site (a lake open to swimming at a national recreation area) may be totally inappropriate at another site (a lake closed to swimming to protect birds nesting at a national park). Rules and regulations for visitors must fit each site. The balance between visitor enjoyment and resource protection is always a delicate balance.

Objective 2 - Access and Enjoyment. Each park unit should be managed to provide the nation's diverse public with access to recreational and educational enjoyment of the lessons contained in that park unit, while maintaining unimpaired those unique attributes that are its contribution to the National Park System. While public access and enjoyment are essential elements of the park system, it should not be the goal of the National Park Service to provide visitors with mere entertainment and recreation. Instead, the public should be provided with enjoyment and understanding of each park in view of its special features. This is entertainment, education, and recreation with meaning.

Objective 3 - Education and Interpretation. It should be the responsibility of the National Park Service to interpret and convey each park unit's and the park system's contributions to the nation's values, character, and experience. Appreciation of a place, a time, or an event is in direct proportion to how much a person knows/learns about that place, time, or event. The challenge of national parks lies in the incredible diversity of people who visit them and in the diversity of the parks themselves. To meet that challenge, there must be a great variety of ways to learn about national parks, including (but not limited to): on-site visitor centers, professional interpreters, interpretation by other people, written and visual materials, educational outreach to schools, and research opportunities for interested professionals and students.

Objective 4 - Science and Research. The National Park Service must engage in a sustained and integrated program of natural, cultural, and social science resource management and research aimed at gathering and using the information needed to manage and protect park resources. Park management decisions must be based on the best information available, and that information must be founded on careful research about the human and natural systems in and around national parks.

The national parks of the United States are one of the greatest resources of all time. To assure that they remain "unimpaired for the enjoyment of future generations," every citizen must develop an understanding of the complex issues facing the National Park System so that the best decisions governing their future will be made on a firm foundation of understanding.

Questions

1. The legislation (law) that created the National Park Service in 1916 stated what the National Park Service would be and do. This legislation is written at the beginning of the background section. What does it mean? What does it say about how people can use national parks?
2. Primary means first or most important. Why are resource stewardship and protection the primary responsibility of the National Park Service?
3. Why is it important for people to be educated about the national parks?

PARK MANAGEMENT TEAM

The National Park Service employees that take care of our parks have many skills and perform a variety of jobs. They work in one of five management groups called divisions. The Superintendent is the park leader. He or she is responsible for making sure that all divisions work well together. The management divisions are described below. Think about which division you might like to work for if you were a National Park Service employee.

The Division of Administration plans the budget and helps with other financial matters within the park such as purchasing and payroll. This division is also in charge of all park property, buys supplies, and pays the bills. It makes recommendations to the Superintendent about how the budget is distributed between the divisions. Administration helps the rest of the park do their jobs. Administration is the park's business office.

The Division of Natural Resources Management is responsible for making sure that all the park resources, including plants, animals, water, air, water, and cultural artifacts, are preserved in as good a condition as possible. Resources Management works closely with all the other divisions to ensure that natural and cultural resources are protected. Its responsibilities include inventorying and monitoring park resources. This division also conducts research to learn more about the park resources. And it works to correct problems that might be harming the park. The people that work in Resources Management are biologists, scientists, geologists, or even archeologists.

Employees in the Division of Maintenance are required to do many different types of work. Maintenance workers are the people who do the carpentry, plumbing, and electrical repair in the park. They also clean and maintain park facilities. Maintenance crews take care of the roads, trails, and signs. They provide clean restrooms, pick up litter, empty trash cans, provide safe drinking water, and repair anything that becomes broken. Maintenance is very important to the overall protection of the park resources.

The Division of Visitor & Resource Protection Park rangers have a full range of duties including: road and trail patrol, fire suppression and control, search and rescue, first aid, wilderness management, fee collection, handling all emergency operations, and law enforcement. Park rangers working in law enforcement protect the resources by making sure that visitors follow the park rules. They inform visitors about the rules, but may give tickets to people who do not follow the rules.

The Division of Interpretation and Cultural Resources is responsible for interpreting (communicating) information about the park's natural and cultural resources. Park interpreters are also responsible for increasing public awareness and understanding of the values of our National Park System. This is accomplished through visitor center exhibits, campfire programs, guided walks and tours, brochures, pamphlets, signs, bulletin boards, and educational programs. The park visitor centers and museums are managed by the division as well as the collection and exhibition of cultural resources. The Division of Interpretation works closely with all divisions.

ORIENTATION PAGE

It is the year 2010 and you work in Wonderland National Park, California, a beautiful park located in the Cascade Mountain Range. It is an easy two-hour drive from large urban areas. The park has many beautiful lakes and streams. It is a land of volcanoes and thermal areas where hot springs bubble to the surface. A single two-lane road runs through the center of the park from north to south. The road is open only in the summer and fall, as winter snows keep it closed the rest of the year. Winter access is limited.

The most popular summer visitor use area in the park is at scenic Summer Lake. The largest park campground is located within one-fourth mile of the lake; it includes a picnic area and a camper store that sells groceries, souvenirs, gifts, and other camping basics. There is a small visitor center/museum, as well as a ranger station and park maintenance facilities. Summer Lake is an outstanding recreation and wildlife habitat area. Because of its scenic beauty and easy accessibility, overuse by people in the Summer Lake area is threatening park resources. Other places within the park are also being affected by visitor overuse.

In the last 25 years, the population in the counties surrounding the park has grown to 1,250,000 people. Visitation in the park has grown to over 1,000,000 per year with visitors coming from all over the world. Management compared to the past has become complex causing conflicts between the need to protect park resources and to allow public access and enjoyment. Managing and running a national park requires careful planning and good decision making.

Your class is the management staff of Wonderland National Park. Using the Park Problem Pages, your task is to develop solutions for current and projected park problems which best protect its resources and allows public use. The solutions you develop will provide the guidelines for running Wonderland. Be sure that each division solves its problems in a way that best protects the park and provides for visitor use. A recommendation for action with justification must be included by each division.

DIVISION OF MAINTENANCE - PARK PROBLEM PAGE

Taking care of a national park used by almost one million people requires a lot of maintenance and upkeep. It takes a professional staff of skilled, trained people to maintain all of the facilities used by the public and by the national park staff. The Maintenance staff takes care of the roads, trails, campgrounds, and picnic areas. Besides these facilities, there are buildings which include historic structures, visitor centers, garages, houses, and office buildings that require maintenance. It is a lot of work to maintain a national park. There are also trash, sewage, and utilities (water and electricity) that have to be taken care of in order to keep the park open and safe for people.

With a limited amount of employees and money to maintain the park this year, the Maintenance staff has to determine which projects have to be done in order to keep the park open and provide the best visitor services. You can only choose five projects that need to be done this summer. The remaining projects will have to be done at a later date. As a group, choose and make a list of the five top projects. Then write down your reasons for choosing each project.

1. Repaint the headquarters office building.
2. Open and maintain water systems in campgrounds.
3. Open all campgrounds that were closed in winter.
4. Resurface park roads.
5. Rewire the electrical system in the Science Center.
6. Put new roofs on the seasonal employee houses.
7. Build recycling bins for the campgrounds.
8. Paint the benches at the Summer Lake amphitheater.
9. Make new trail signs for the backcountry trails.
10. Rebuild and restore four historic buildings.
11. Rebuild trail bridges damaged by winter snow.
12. Repair boat launch at Summer Lake.
13. Clear trails of fallen trees.
14. Install lights in visitor center.
15. Build new picnic area.

DIVISION OF VISITOR & RESOURCE PROTECTION - PARK PROBLEM PAGE

The Summer Lake area is one of the most popular areas in the park. It has a campground, picnic area, access to trails, and great fishing. Because of its popularity, the area is getting overrun by people. More and more people create more problems for the rangers who are trying to protect the park and also provide for visitor safety.

In order to provide the best service to the public, with a limited staff, the Chief Park Ranger and his/her district rangers have to decide on the best way to deal with park problems. With only two park rangers available at any one time in the area of Summer Lake, the Chief Park Ranger and the district rangers have to make sure their staff knows what problems should be taken care of first. Your job is to put the following situations needing immediate ranger assistance (help) in an order of one to ten. Number one would be the highest priority and number ten the lowest. You then need to be able to explain to the class why you chose the order you did.

1. A camper cuts a finger on an axe while cutting firewood.
2. A dog is running loose at the lake and is chasing ducks which is not allowed in a national park.
3. Children and adults are feeding deer in the campground which is not allowed in a national park.
4. A camper reports an "out of control" small fire at the campground.
5. A visitor has locked his keys in his car at the visitor center and needs the rangers to help open his car.
6. A visitor is picking flowers and collecting rocks at the picnic area which is not allowed in a national park.
7. A visitor wants to talk with a ranger about night camping in the park's wilderness area.
8. There is a Black Bear on the park road creating a traffic problem.
9. Some kids are swimming in the "no swimming area" of the lake.
10. A visitor has lost her camera and wants to report it to a ranger.

DIVISION OF INTERPRETATION & CULTURAL RESOURCES
PARK PROBLEM PAGE

With more and more people visiting the park each year, especially the Summer Lake area, the Division of Interpretation, with its limited staff, is faced with the challenge of how to best educate and inform the visitors about the park and its resources.

Expecting a busy summer, the Interpretive staff is looking at other methods in addition to traditional ranger-led walks, talks, and campfire programs to teach visitors about the park. The staff has come up with a list of eight methods for informing visitors. It is a real challenge because park visitors are children and adults from not only the United States, but from all over the world. The methods must be carefully looked at by the staff. As part of the Interpretive staff, your job is to choose three methods that you feel will be used most often by three groups: (a) families, (b) adults, and (c) children. Make a list of your choices for each of the three groups. The same method can be used by more than one group. The interpretive methods for sharing information about the park are listed below.

1. Self-guided trail brochure - interpretive brochures used with numbered posts along nature trails that inform visitors about special features.
2. Cassette and/or CD interpretive guides - audio guides used to explain park features along its roads, in historic buildings, or about exhibits, and an orientation guide to the park.
3. Roadside exhibits - displays and signs along roads at turnouts, scenic overlooks, historical buildings, and at special places that provide information about the park's natural and cultural history.
4. Books and pamphlets - written information sold in visitor centers, park stores, and ranger stations that provide specific or general information about the park. Some book titles: Trees of Wonderland National Park, Flowers of Wonderland, Wonderland's Volcanoes.
5. Videos - tapes providing a general park overview or specific information about a major subject of interest in the park. Videos are 15 to 60 minutes long and are purchased by visitors. Videos are also shown in the visitor centers to provide new visitors with park orientation or information.
6. Park newspaper - a small paper (eight pages or less) published by the park which is given to visitors as they enter the park. It contains a wide variety of park information.
7. Self-guided junior ranger programs - programs that provide children with activities to learn and discover the park's natural and cultural history.

8. Self-guided family discovery programs - programs that provide families with a variety of activities to learn and discover the park's natural and cultural history.

DIVISION OF NATURAL RESOURCES MANAGEMENT - PARK PROBLEM PAGE

Summer Lake has been a popular lake to fish for trout for over 100 years. A fish stocking program (placing fish raised in hatcheries in park lakes) has been in existence for over 60 years to provide more fishing opportunities for visitors. In keeping with the goals of the National Park Service of protecting the park's lake ecosystems, the fish stocking program is going to be stopped at Summer Lake and all other lakes beginning next summer. The Resources staff is concerned that Summer Lake will be fished out in the next few years if it is no longer stocked and individuals are still allowed to catch five fish a day. The staff needs to come up with a plan to maintain a healthy trout population; it may mean people can no longer fish the lake.

There are many other things to consider in making a decision about fishing at Summer Lake. The lake is a community made up of many interrelated lifeforms. Mammals, insects, amphibians, and many different plants call Summer Lake their home. It is a nesting area for a diverse bird population including Canada Geese, mallards, warblers, and a variety of songbirds. It is also an important resting site for birds on long migratory flights. The decisions made on managing the lake affect more than just people and fish.

The division has come up with the following list of management options. Your job as resource managers is to come up with what you feel is the best option for providing public enjoyment of Summer Lake and protecting the lake and its fish population. Be prepared to explain which option you choose and why to the class.

1. Allow no fishing in the lake at all. Possible impacts: (a) people would have to go to other places to fish, (b) no fishing by the public could result in more wildlife using the lake, (c) trout populations could increase on their own, and (d) people would be upset at losing their right to fish and complain.
2. Allow visitors to catch a limit of two fish. Possible impacts: (a) people could still enjoy fishing at Summer Lake, (b) the lake could be fished out, resulting in a lake with no fish, and (c) decline in wildlife due to the increase in people and the lack of fish as a possible food source.
3. Allow for "catch and release" fishing at the lake (catching fish with barbless hooks and returning them to the lake). Possible impacts: (a) visitors could enjoy fishing without depleting the lake of fish, (b) wildlife dependent on fish such as Bald Eagles could use the lake, maintaining a well balanced lake ecosystem, and (c) the Resources staff would be keeping within the guidelines for protecting and preserving the park.
4. If you do not like any of the options above, come up with your own.

DIVISION OF ADMINISTRATION - PARK PROBLEM PAGE

The park budget needs to be reduced by 10 percent over the course of the next five years. The Superintendent and his/her Administrative staff must make \$100,000 worth of cuts in order to balance the budget. As part of the Division of Administration you need to carefully examine all of the items on the Budget Page and their impacts. As a group you then need to choose the items you wish to cut that total \$75,000.

The Superintendent has told you that you can not cut high priority items such as health/safety, visitor protection, and law enforcement. Remember, you also want to protect the park resources while providing for public use. These are tough decisions that have to be made. Be prepared to share the list of items you are cutting in the budget with the rest of the class. Remember, the items have to add up to \$75,000.

| PROPOSED CUTS | IMPACTS | SAVINGS |
|---|--|----------|
| Eliminate Backcountry Ranger | 8,000 visitors not served, limited monitoring of park resources | \$ 8,000 |
| Shorten Operating Season at Prime Visitor Contact Areas (June 20-September 4) | 10,000 visitors not served, visitor center and campgrounds would close early (visitor impact) | \$17,000 |
| Cut Water/Sewer Operations Parkwide | Will result in an increased number of visitor complaints due to lack of water and closed restrooms, would affect 450,000 visitors annually | \$35,700 |
| Close Winter Use Area | 20,000 visitors not served, school programs would be eliminated, increased problems with the winter visitor center because of inattention to its maintenance | \$35,000 |
| Eliminate One Employee from Division of Interpretation | 5,000 visitors not served, 120 interpretive programs eliminated | \$ 6,000 |
| Shorten Season for Three Maintenance Employees (Road Crew) | Deterioration of roads and buildings and increased long term costs from not performing maintenance | \$11,000 |
| Eliminate Trail Maintenance | Deterioration of 150 miles of trails, portion of Pacific Crest Trail would be affected, 8,000 visitors impacted | \$19,000 |
| Reduce Number of Portable Toilets at Visitor Center | Would affect 450,000 annual visitors, cause lines at available toilets, impact maintenance of remaining facilities | \$ 7,000 |
| Reduce Maintenance of Park Facilities | Visitors impacted by reduced maintenance of headquarters area grounds, buildings, restrooms, and trash removal | \$ 5,000 |
| Delay Road Opening Three Weeks | 62,000 visitors not served, impact on concession operations, economic hardship for counties surrounding the park | \$25,000 |
| Delay Summer Lake Campground Opening Three Weeks | 5,000 visitors not served | \$15,000 |
| Close Two Campgrounds | 8,000 visitors not served | \$25,000 |



ACTIVITY GUIDE FOR TEACHERS

A teacher's guide developed by the National Park Service
and funded by the National Park Foundation





The National Park Service follows guidelines set by the Organic Act, which was passed by Congress on August 25, 1916. The act states, "The Service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments and reservations...which purpose is to conserve the scenery and the natural historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Parks As Classrooms is an educational initiative of the **National Park Service** in partnership with the **National Park Foundation**.



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FOREWORD

Lassen Volcanic National Park is a unique outdoor classroom rich in natural and cultural resources. The park was established by an Act of Congress on August 9, 1916 to protect the site of the then most recent volcanic activity in the contiguous United States and its related biotic and cultural resources for the benefit and enjoyment of its visitors.

Besides the diversity and complexity of volcanic features, Lassen is a biological crossroads which blends together the wealth of the Cascades, Sierra Nevada, and Columbian Plateau biotic provinces. The cultural significance of the park lies in its long history of Native American use. Pioneer heritage is also evident along the 23 miles of the historic Nobles Emigrant Trail winding through the park.

Lassen Park is a vast resource and magnificent environment. It is an area that if treated with respect and care will be a point of inspiration for generations far into the future. This respect and care can only come from educating the area's future managers and users.

ACKNOWLEDGEMENTS

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INTRODUCTION TO USING THIS GUIDE

Welcome to Lassen Volcanic National Park. We are delighted that you are taking the opportunity to use National Park Service resources to enhance the classroom learning experience.

Activities in the guide have been designed to be easily adapted to meet the needs of a wide range of grades without much modification by the teacher. The activities are appropriate for use with students in grades four through twelve. Any part of the guide can be pulled out for specific study. All of the materials are interdisciplinary. They are intended to supplement and enrich existing curricula.

The objectives of this guide are to:

1. Provide teachers and other educators with classroom and onsite activities about Lassen Park
2. Acquaint students with some of Lassen Park's volcanic and human history through hands-on activities
3. Develop within students an awareness and understanding of the value of Lassen Park and the National Park System
4. Enhance and enrich student educational learning experiences
5. Direct students toward actions they can take to protect the park

UNIT OVERVIEW

This guide has been organized into four units to better serve the teacher. Each unit has been designed to stand alone as an educational device or to be used in conjunction with other units of study.

Unit I - Volcanoes contains activities that introduce students to the fascinating history of Lassen Peak's eruption and the park's extensive hydrothermal features. Lassen Volcanic National Park is world famous for its volcanic wonders and represents an outdoor classroom for students of all ages.

Unit II - Native Americans represents an important part of Lassen's rich cultural heritage. The area that is now Lassen Park was once a crossroads of Native American culture. Students will learn about Native Americans through a variety of hands-on activities that are both fun and educational.

Unit III - Pioneers focuses on the hardships and travels of those hardy individuals who traveled west in search of a new life. Approximately 23 miles of the historic Nobles Emigrant Trail run through Lassen Park. This trail established in 1852 was an offshoot of the California trail which led thousands of pioneers into Northern California in the 1850s and 1860s. Students will learn about the hardships of pioneer travel through a variety of interdisciplinary activities. They will role play pioneer life and learn how and why these pioneers traveled west.

Unit IV - The National Park Idea includes activities that provide students with creative ways to learn about the concept of national parks. The establishment of the National Park System is truly an American idea. National parks have been established and modeled after our National Park System all over the world. Through classroom and onsite activities, students explore and discover the National Park Idea.

ASSESSMENT

There are many assessment items embedded into the Lassen activities. These include student products, presentations, and written records of activities and projects. Suggestions for portfolio artifacts are made throughout the materials. Teacher and student expectations for activities will need to be established prior to doing the activities to provide clear guidelines for successful completion.

The following assessment tools may be used to gain a broad view of the student's work:

1. Keep track of what students accomplish and are able to do during experiments, investigations, field work, readings, and research. Let students know regularly how they are doing. Are they making the most of their time and resources?
2. Create open-ended questioning strategies that encourage students to think about problems. Allow for a variety of answers that show creativity, imagination, and an understanding of the problems posed.
3. Create situations for groups of students to work together to solve problems, test hypotheses, and discuss results. Evaluate group performance as part of the assessment.
4. Have every student keep a notebook for evaluation purposes to encourage the use of writing as a thinking/problem solving tool.
5. Be sure that students evaluate their own work on a regular basis. Let them assign grades. You can work with them to set up parameters, and then let them decide the quality of completed work.
6. Drawings, charts, tables, and other visual representations of work provide important assessment tools. Encourage their use.
7. Have students develop their own problem solving techniques when faced with problems and issues related to their studies.
8. Pre and post tests provide useful information but need to be used in conjunction with other assessment tools.

Student portfolios provide a place to collect student work that shows efforts, progress, and achievement over time. Four areas to be included in the development of portfolios are:

- Student participation in selection of portfolio items
- Criteria for selection
- Criteria for judging merit
- Evidence of student self-reflection

Products for student assessment might include:

| | | |
|--------------------------|-------------------------|-------------------------|
| advertisements | graphic design | pre and post test |
| board games | guest speaker | poster |
| book cover | haiku | puppet and/or show |
| book review | history of person/place | puzzle |
| bulletin board | independent experiment | questionnaire |
| card game | invention | questions |
| charcoal sketch | journal | radio show |
| chart | labeled diagram | recipe |
| collage | large scale drawing | reference file |
| collection with labels | lecture | relief map |
| collection and narrative | lesson | rubbing |
| comic strip | letter to the editor | science fiction story |
| computer program | magazine article | scrapbook |
| court trial | map with legend | sculpture |
| crossword puzzle | mobile | short story |
| dance | model | silk screening |
| debate | movie | skit |
| detailed illustration | mural | slide/tape presentation |
| diagram | museum exhibit | small scale drawing |
| diary | musical composition | song |
| diorama | newspaper article | stitchery |
| display | news report | survey |
| drama presentation | oil painting | taped recording |
| dramatic monologue | oral report | teach a lesson |
| dramatic set design | package for product | terrarium |
| editorial | painting | test book |
| effigy | pamphlet | travelogue |
| etching | pantomime | TV documentary |
| fable | photo essay | TV newscast |
| fact file | photographs | videotape |
| film | picture book | vocabulary list |
| film strip | play | water color |
| glossary | poem | written report |
| graph | | |

A thought to consider when working with students:

When the famous physicist, J. Robert Oppenheimer, was asked why he decided to study physics, he answered that his teachers allowed him the exhilaration of his own discoveries, and when one experiences that exhilaration, he becomes a learner for life. The most we can do for our students is to model lifelong learning and support them as they find the exhilaration of their own discoveries. Assessment can and must be part of the learning.

Some of the ideas included here are taken from the Northwest Integrated Concept/Process Hands-on Environmental Science Curriculum Guide, distributed by the USDA-Forest Service, Mount St. Helens National Volcanic Monument.

VOLCANOES OF LASSEN

SUMMARY: Students will learn how volcanoes are formed through a hands-on demonstration.

GOAL: To increase student awareness and understanding of the processes that created the four major types of volcanoes found in Lassen Volcanic National Park.

OBJECTIVES: By the end of the demonstration, students will be able to (1) name the four major types of volcanoes found in the world and in Lassen Volcanic National Park, (2) describe how each of the four types of volcanoes are formed, (3) define the following terms: lava, magma, volcano, volcanic crater, volcanic vent, and volcanologist, (4) name and identify at least two kinds of volcanic rocks: basalt, andesite, dacite, pumice or cinder (upper grades).

GRADE LEVEL: Second through twelfth

TIME REQUIRED: 30 to 60 minutes

LOCATION: Classroom or field site

MATERIALS: Total cost is about \$20. (1) Volcano model made of 2'x2' piece of strong flat cardboard with a hole cut in the center to fit a one-pound coffee can. Cut both ends out of the can and push it up into cardboard with 3/4 of the can projecting above the top of the cardboard. Place sturdy paper plates around coffee can leaving the opening free to form a volcano shape. Secure paper plates to coffee can and cardboard base with strapping or masking tape. After all plates are in place, cover plates and cardboard base with plastic coated packaging tape. (2) Can of shaving cream. (3) Large tube of toothpaste. (4) Package of Sugar Pops or round puffed corn cereal. (5) Small funnel to fit in top of volcano (top of can). (6) Package of paper towels and plastic disposal bag. (7) Air or foot pump with extension tube. (8) Rock types: basalt, andesite, dacite, cinder, and pumice (optional). Rock types can be purchased through various educational supply companies. **Remember collecting rocks in Lassen Volcanic National Park is not allowed.** (9) Picture, puzzle, or model showing the inside of a volcano.

SUBJECTS: Earth Science, Geography, Geology

KEY WORDS: Lava, Magma, Volcano, Volcanologist, Basalt, Andesite, Dacite, Cinder, Volcano Crater, Vent

BACKGROUND: Teachers should read handouts on volcanoes provided by the park that define the terms and processes forming the four types of volcanoes (cinder cone, shield, plug dome, and strata cone or composite). Associated rock types should also be identified if used.

INSTRUCTIONAL SEQUENCE: (1) Using a picture, puzzle, or drawing of a volcano, have students explain what a volcano is. Define the terms: volcano, magma, lava, crater, and vent. Explain how a volcano is formed using these terms and answers given by the students. (2) Explain that you will demonstrate (with their help) how the four types of volcanoes are formed. (3) Proceed to demonstrate the four types of volcanoes. With each demonstration you will need two students to hold the volcano model and one student to demonstrate the eruption sequence. (4) Demonstration sequence follows.

Plug Dome Volcano (a) Explain that the magma and lava pushing up through the vent is like chunky peanut butter or toothpaste. Place a tube of toothpaste under and up through the center of the volcano model. Make sure the top of the toothpaste tube is above the rim of the model. Slowly squeeze the toothpaste tube so that the toothpaste comes out of the tube without going down the side of the tube. (b) Tell the children that this is how a plug dome volcano pushes up and is formed. Explain that because the magma moves slowly up through the volcano like toothpaste, pressure builds up within the earth, which usually results in a violent eruption. This thick pasty magma and lava cannot move very fast or travel very far down the side of the volcano. Since the magma moves slowly up through the volcano, larger crystals are able to form in the cooling magma, forming dacite lava rock. The magma reaches a temperature of 1500° F and is not as hot as other magmas. The lava, as can be seen from the demonstration, pushes up as a large mass forming a dome and as it cools it plugs the crater vent creating a plug dome volcano. (c) Show the students a piece of dacite lava. Name some famous plug dome volcanoes in Lassen Volcanic National Park: Lassen Peak, Chaos Crags, and Bumpass Mountain.

Shield Volcano (a) Shake the can of shaving cream well and place it under and up through the center of the volcano model. While the teacher holds the shaving can in place, have the student, who is demonstrating the shield volcano eruption, press on the shaving can to release the shaving cream. (b) Have students note the large volume of lava coming out compared to the plug dome volcano. The lava is hotter (2000° F.) and comes out quicker so no crystals are formed. Consequently, it flows easier and travels further forming a river of lava and a very large broad based volcano. Ask students if the eruption is pahoehoe lava or aa lava. Note: Pahoehoe lava is smooth in appearance; AA lava is jagged and sharp in appearance. Both are basalt type lavas. (c) Show a piece of basalt rock; note that there are no crystals in the rock since the lava cooled too quickly for them to form. (d) Name some famous shield volcanoes: Mount Harkness and Prospect Peak (in the Park), Mauna Loa, and Mauna Kea (in Hawaii).

Cinder Cone Volcano (a) Place a funnel on top of the volcano model. Connect a small air pump with the tube under and up through the model to the funnel opening. Place Sugar Pops, Rice Crispies, corn puffs, or any other light, dry cereal in the funnel. Activate the foot pump by having a student press down on it, which will result in the cereal being blown out simulating a cinder cone eruption. Have students pick up the cereal off the floor. Do not allow students to eat the cereal. (b) Share a piece of cinder volcanic rock. Have students note that there are lots of holes in the rock due to the magma having lots of gas in it. The holes are where gas bubbles once existed. The gas helped create this type of lava and eruption. It is like popcorn popping; it throws the erupting cinder lava out of the crater forming a cinder cone with an open crater in the center. (c) This is the most common type of volcano in the world. Name some famous cinder cones in the Park: Hat Mountain, Cinder Cone (near Butte Lake), and Fairfield Peak.

Composite or Strato Cone Volcano (a) Demonstrate any two or three of the previous volcano demonstrations in sequence to simulate the formation of a composite volcano, which is a combination of the other three types. This type of volcano is long lived and forms over many centuries. A common type of lava associated with this type of volcano is andesite. Composite volcanoes may have cinder cones on their tops. Name some famous composites outside the Park: Mount Shasta, Mount St. Helens, and Mount Rainier. A composite volcano within the Park: Mount Tehama; remnants of this volcano include Brokeoff Mountain, Mount Diller, Pilot Pinnacle, and Mount Conard. The Sulfur Works Thermal Area may have been its central vent area.

EXTENSION/ENRICHMENT: (1) Have students draw pictures of each of the four types of volcanoes. (2) Have students look up stories about famous volcanoes and their eruption history in a reference book or on the Internet and share with the class. (3) Have students demonstrate the shapes of the four types of volcanoes with body movement. Example: outside the classroom, students could do “jumping jack” type exercises demonstrating the shapes of the four types of volcanoes. Or students could do walking-type exercises demonstrating volcano lava flow: fast walk (shield volcano), explosive walk (cinder cone), slow walk (plug dome), and fast-explosive-slow at random walk (composite volcano).

ASSESSMENT: (1) Have students name and describe the four different types of volcanoes in writing or oral presentations. (2) Have students draw pictures of each type. (3) Have students write a story about the eruption sequence of one or more of the volcano types. (4) Have students locate and identify two or more of the volcano types demonstrated in this activity on a Lassen Volcanic National Park map.

EARTH COOKIES

SUMMARY: Students will classify and compare cookies and rocks according to their structure and composition.

GOAL: To enrich student understanding of how igneous rocks are formed and why their structure and composition results in different characteristics

OBJECTIVES: Students will compare and contrast different types of cookies and igneous rocks and classify them according to their structural make-up and ingredient composition.

GRADE LEVEL: Fourth through Twelve

TIME REQUIRED: 45 minutes

LOCATION: Classroom

MATERIALS: Cookies (see note under preparation), paper towels, two sets of four different types of igneous volcanic rocks (basalt, andesite, dacite, cinder, pumice, etc.), one metamorphic rock, one sedimentary rock, recipe page, worksheets, pencils

SUBJECTS: Science, Language Arts

KEY WORDS: Structure, Composition, Characteristics, Classification, Minerals, Ingredients, Igneous, Sedimentary, Metamorphic

BACKGROUND: Although the average student is relatively unfamiliar with rocks, especially their composition and formation, most students are very familiar with cookies. In actuality, cookies and rocks have many similarities, especially in the ways that they are formed. For this reason, a careful study of cookies provides a great introduction to rock formation and structure.

The building blocks of cookies are flour, butter, eggs, sugar, and baking soda. When the ingredients are mixed together, they create a substance that is not at all like the individual ingredients. The texture changes when the dough is heated. The exact same dough will produce very different results depending on the amount and type of heat to which it is exposed (the gooey cookie, the perfect cookie, the burnt cookie).

The process that produces cookies is similar to that which produces igneous rocks. The building blocks of rocks are various minerals. These ingredients can be mixed together to produce a variety of rocks. The degree of heat, water, pressure, and friction change the characteristics of the rocks, as does the way the rock cools.

Rocks can be classified using many criteria including but not limited to: weight, color, hardness, and where and how they originated. Rocks are classified into three main groups: sedimentary, metamorphic, and igneous rocks.

Sedimentary rocks are formed when different materials are laid down one on top of the other. They are characteristically layered and are formed by either deposits of previously weathered rocks, dead marine organisms, or crystallized chemical precipitates. Sandstone, shale, and limestone are examples of sedimentary rock.

Metamorphic rocks are made deep in the earth. Any kind of rock can be turned into a metamorphic rock by heat, pressure, or penetration of hot fluids. For example, shale will metamorphize into slate, sandstone becomes quartzite, and limestone will alter to marble.

Igneous rocks are made from magma that has cooled and solidified. When it cools beneath the surface, it is called intrusive igneous. Generally, intrusive magmas cool deep within the earth in an insulated environment. Crystals have time to grow large enough to be seen without magnification. When magma cools above the surface it is called extrusive igneous. This magma cools very rapidly when exposed to air resulting in smaller crystals or no crystals at all. Crystals do not have time to form. Granite is an example of intrusive igneous rock. Basalt and dacite are examples of extrusive igneous rocks.

INSTRUCTIONAL SEQUENCE:

1. Preparation of cookies. This activity will be more meaningful if the students make the cookies instead of buying them. Ask for student volunteers to make cookies the day before you do this activity. Enough cookies should be made so that there will be one of each type per student. Simple recipes for the four cookie types needed are included on the Recipe Page. You can photocopy individual recipes and send them home.
2. Discuss the differences between the three rock types and introduce the lesson. Explain that the students are going to learn more about igneous rocks, specifically the extrusive rocks that come out of volcanoes.
3. Pass out the cookies, paper towels, pencils and the Cookie Worksheet. Instruct the students to observe the cookies carefully. Many of the questions do not have right or wrong answers. Have students fill out the worksheet.
4. Put the rocks out on a table. Label and number the rocks 1 through 4.
5. Working in groups or individually have the students observe the rocks and fill out the Rock Worksheet.
6. When all the students have completed their worksheets, discuss their findings. Compare and contrast the similarities between the two mediums.
7. When finished with the activity, eat the cookies!

EXTENSION/ENRICHMENT: (1) At home students can experiment with cookie dough. Try changing the composition just slightly and see what happens. Bake them at a higher or lower temperature, bake them for shorter or longer than called for, melt some cookie dough in a pot on the stove top, bake a cookie in a microwave, or throw a hot cookie in the air. What happens to it? (2) Have the students look for igneous rocks in their neighborhood and bring them to class.

ASSESSMENT: Students describe and list three similarities between cookie and igneous rock formation. Have students describe how they identify the differences between different igneous rocks. Have the students write a story about the formation of a volcanic rock.

COOKIE WORKSHEET

Name of Cookie Connoisseur _____

Rocks are similar to cookies in many ways. They differ in ingredients and the temperature that they are heated. They are made and react to heat much like kitchen-made cookie dough. Use the most descriptive words you can think of to describe the following:

| | Sugar | Peanut Butter | Chocolate Chip | Oatmeal |
|-----------------|-------|---------------|----------------|---------|
| Smell | | | | |
| Shape | | | | |
| Color | | | | |
| Texture | | | | |
| Main Difference | | | | |

Look at the recipe sheet and list the ingredients that are common to all the cookies:

Which cookies are the most alike? _____ Why?

Which cookies are the least alike? _____ Why?

Does cookie dough look like the finished cookie? ____ Why or why not?

How would the cookies be different if you baked them (a) for half the time the recipe called for? _____ (b) for twice as long as the recipe called for? _____ (c) at a lower temperature? _____ (d) at a higher temperature?

What would happen to the chocolate chip cookie dough if you heated it in a pan on the stove top?

What would happen to the chocolate chips in the dough if they were heated together on the stove top and stirred?

Break one cookie in half. Is the texture on the inside the same as on the outside?

If you took a cookie hot out of the oven and threw it in the air, do you think it would change shape? ____ What would happen when it landed?

ROCK WORKSHEET

Name of Rock Hound

You should have four rocks. Number them 1 through 4.

Use the most descriptive words you can think of to describe the four rocks.

| | 1 | 2 | 3 | 4 |
|-----------------|---|---|---|---|
| Smell | | | | |
| color | | | | |
| Shape | | | | |
| Texture | | | | |
| Main Difference | | | | |

Can you see any minerals common to all the rocks?

List anything you see that they have in common.

Which rocks are the most alike?

Why?

Which rocks are the least alike? _____ Why?

Do you think the magma looked like the solid rock does now?

Pick a rock with crystals. Do you think it cooled quickly or slowly?

Why?

Do you think the magma that made this rock would look the same if it was thrown up in the air while still hot?

Pick another rock. If you were able to stick it into a magma chamber, would it look the same when it came out and cooled as it does now? _____ Why or why not?

List similarities between cookies and igneous rocks.

RECIPE PAGE

Sugar Cookies

| | |
|--------------------|---------------------|
| 1 cup butter | 1 cup sugar |
| 2 eggs | 1 Tbsp water |
| 1 tsp vanilla | 1 tsp baking powder |
| about 3 cups flour | |

Cream butter and sugar together. Beat in vanilla, water, and eggs. Sift in dry ingredients gradually. Roll out to 1/4 inch thickness. Cut in desired shapes or with cookie cutters. Put on ungreased baking sheet. Bake for 10 minutes at 375 degrees.

Peanut Butter Cookies

| | |
|----------------------------|---------------------|
| 1 cup chunky peanut butter | 1/2 cup butter |
| 1/2 cup sugar | 1/2 cup brown sugar |
| 1 egg | 1/2 tsp salt |
| 1/2 tsp baking soda | 1/2 tsp vanilla |
| 1 to 1 1/2 cups flour | |

Cream butter and sugars together. Beat in egg, peanut butter, salt, baking soda, and vanilla. Sift in flour. Roll into small balls and place on ungreased cookie sheet. Press flat with a fork. Bake 10 to 12 minutes at 375 degrees.

Chocolate Chip Cookies

| | |
|-----------------------|----------------------------------|
| 1 cup softened butter | 3/4 cup white sugar |
| 3/4 cup brown sugar | 1 tsp vanilla |
| 1/2 tsp water | 2 eggs |
| 2 1/4 cups flour | 1 tsp soda |
| 1 tsp salt | 12 oz semi-sweet chocolate chips |

Cream butter and sugars together until well blended. Add vanilla, water, and eggs. Beat until creamy. Add flour, salt, and soda. Stir. Add in chocolate chips. Drop by teaspoons onto ungreased cookie sheet. Bake for 10 to 12 minutes at 350 degrees.

Oatmeal Cookies

| | |
|-------------------------|----------------------------|
| 1/2 cup butter | 1/2 cup packed brown sugar |
| 1/2 cup white sugar | 1 egg |
| 1 tsp vanilla | 1 Tbsp milk |
| 1 cup flour | 1/2 tsp baking soda |
| 1/2 tsp baking powder | 1/2 tsp salt |
| 1 cup quick rolled oats | |

Cream butter and sugars together until well blended. Add vanilla, egg, and milk. Sift dry ingredients together. Stir until smooth. Add oats. Drop by teaspoons onto ungreased cookie

sheet. Bake for 10 to 12 minutes at 350 degrees.

I-21

NATURE'S PALETTE

A Field Study of a Hydrothermal Area

SUMMARY: Students will visit an active hydrothermal area in Lassen Volcanic National Park to identify the main features and learn about the chemical processes forming these areas.

GOAL: To introduce students to the features and processes that have shaped and reshaped Lassen Volcanic National Park's hydrothermal areas.

OBJECTIVES: By the end of the activity students will be able to: (1) Identify and describe three common hydrothermal features. (2) Name at least three colors found at the hydrothermal features and use the key to identify the processes which created them. (3) Explain two important safety rules for enjoying and learning about the hydrothermal areas. (4) Explain two reasons why it is important to protect the park's hydrothermal features. (5) Explain two ways an individual can assist in preserving them.

GRADE LEVEL: Fifth through twelfth

TIME REQUIRED: 30 to 60 minutes

LOCATION: Lassen Volcanic National Park hydrothermal areas (Bumpass Hell, Sulphur Works, Devils Kitchen)

MATERIALS: Hydrothermal Area Field Study Page and Color Key Fact Sheet - one each per student. A pencil and note pad, or clipboard to be used at the field site by each student.

SUBJECTS: Earth Science, Geology, Chemistry

KEY WORDS: Volcano, Hydrothermal, Magma, Lava, Fumarole, Mud pot, Boiling Springs, Chemical Compounds, Minerals

BACKGROUND: Volcanic areas do not always die silently. Magma at depths of only a few miles can take thousands of years to cool. The fumaroles, boiling springs, and mud pots in the park's hydrothermal areas testify to the landscape's recent volcanic origin. Rain and melted snow percolate deep into the earth where the water is heated by a mass of hot rocks from magma six to twelve miles below the surface. The Lassen hydrothermal system consists of a lens-shaped reservoir of groundwater deep within the Earth. Steam as hot as 464 degrees F rises and condenses into water again, mixing with percolating ground water nearer the surface. The mixture produces sulfate water that boils at elevated pressure at about 200 degrees F. All of the park's hydrothermal areas are connected underground and fed by the same hydrothermal reservoir. Features such as fumaroles, mud pots, and boiling springs often occur side by side at the same site. These features are in constant change due to groundwater conditions, chemical weathering, and earth movement.

INSTRUCTION SEQUENCE: In the classroom, discuss information about the park's volcanic features and its hydrothermal areas with the students. Discuss why it is important to Preserve and Protect these unique hydrothermal features. Before entering any of the hydrothermal areas, please go over all park rules with the students. It is extremely important that everyone knows the rules and agrees to follow them. Please go over the following rules with the students.

Throwing rocks, sticks, trash, or anything else into the boiling springs, mud pots, or fumaroles is not allowed. In National Parks all natural and cultural features are protected by law. Think Safety! Stay on the trail and boardwalks at all times. No running or fooling around. Do not touch the water or other features in the hydrothermal areas. They may be hot and contain harmful chemicals. Visiting hydrothermal areas like Bumpass Hell or Sulphur Works can be a fun, safe, and educational experience if everyone follows the rules. Breaking the rules could result in severe burns and personal injury.

NOTE: Bumpass Hell is named after Kendall V. Bumpass, the first pioneer to discover the hydrothermal area. The story told is that Mr. Bumpass “walked off the trail,” and fell through some thin crusted ground and plunged his leg into a boiling spring. He was burned severely.

At the trailhead parking area or the entrance to the hydrothermal area make sure all of the students are clear about the rules. Divide the class into small working groups of two to four students, or have them work individually. Tell the class they are going to be geologists studying the hydrothermal area in the park. Pass out the Hydrothermal Area Field Study Page. Read and discuss what the students will do in the field. Explain that each group is to record their observations using the Field Study Page. Set a time limit. When everyone is finished, collect the study pages. Explain that the results of their observations will be discussed back in class.

When back in class, pass out the Study Pages from the field trip. Discuss and review what they saw and experienced. Pass out the Color Key Fact Sheet. Using the Color Key, have the students write down the answers for the colors they observed at the hydrothermal area in the column “How were the colors formed?” on their Field Study Pages. Discuss the results with the class.

EXTENSION/ENRICHMENT: (1) Have students research other national parks that have hydrothermal areas and compare them to the features at this park. (2) Have students write a poem based on their field trip experience. (3) Have students imagine that they are newspaper reporters that have traveled to the hydrothermal area with Mr. Bumpass in 1865. Write a story about that experience.

ASSESSMENT: (1) Have students draw a color picture of the thermal area with the appropriate colors and features. (2) Using the information from the field trip and class activity have the students write a story about the hydrothermal area and the processes that formed the soil colors. (3) Share student experiences at the park's hydrothermal area with another class or parents. (4) Have students write down the rules for visiting the hydrothermal areas and the reasons for the rules. (5) Ask the students to list reasons why it is important to “protect and preserve” National Parks. (5) Develop student questions based on the Field Study Pages and Color Key Fact Sheet.

Color Key Fact Sheet

Read the information below on how the colors were formed at the hydrothermal areas and select the appropriate answer. Copy the correct answer onto your Field Study Page. Add any additional notes and observations from your visit.

YELLOW

The yellow color and crystals are formed from sulfur dioxide gases escaping into the air from a fumarole or vent. As the gas escapes, it leaves behind a deposit of pyramid-shaped sulfur crystals or stains. The rotten egg smell is hydrogen sulfide gas.

WHITE

The soft, white powdery soil is what is left of volcanic rock after it has been completely broken down by sulfuric acids and steam. It is made up of silica and kaolinite minerals.

BLACK OR GRAY

The black and gray colored soils are volcanic rock that has not yet been completely broken down by the sulfuric acid and steam. This results in gray colored clay minerals or black and brown iron mineral compounds. These minerals are spattered out and deposited on the surface near a vent. The black scum on the surface of some of the pools is pyrite an iron-sulfide mineral better known as "Fools Gold."

RED, TAN or BROWN

The ground was stained by red, brown or tan iron-rich mineral compounds that are in the water and steam of the boiling pools and fumaroles. Various chemical reactions with the lava rock in the hot waters of the pools cause the escaping gases to be full of these iron-rich minerals. When the gases escape into the air, some of the mineral compounds they contain are deposited on the ground.

GRAY-COLORED WATER AND MUD

This is was once solid rock. Heat, water, gases, and time along with sulfuric acids have altered the volcanic rock and turned it into clay.

YELLOWISH -ORANGE

The yellow-orange material that covers the ground is sulfate minerals. Sulfate-rich water evaporates at the surface, leaving the colorful sulfate mineral deposits behind.

GREEN

The green color is a plant called alga that grows in the cooler parts of the hot springs, on rocks, in the streams, or on the edges of the hot pools. Other microorganisms including bacteria also live in the hydrothermal features.

Lassen Volcanic National Park Hydrothermal Area Field Study Page

Name _____ Date _____

Location _____

Read the description of each feature; find at least one example of each. Write down the colors you see at each feature. Look for the colors of mud, soil, water, and stains on the ground. Make additional notes on the back. Do not write in the “How were the colors formed?” column; this will be done later using the color key fact sheet.

| Hydrothermal Feature | Colors I observed | How were the colors formed? |
|---|-------------------|-----------------------------|
| BOILING SPRINGS Bubbling pools of water with rising steam, often smelly. | | |
| MUDPOT A pool of boiling mud. | | |
| FUMAROLE A volcanic vent with gases hissing out; may be smelly. | | |
| DRY BARREN COLOR STAINED GROUND The ground in and around the hydrothermal area. | | |
| RUN-OFF STREAMS Hot or cool streams flowing away from thermal features. | | |

THE BIG STORY - LASSEN PEAK ERUPTS

SUMMARY: While visiting the Hot Rock and Devastated Area in Lassen Volcanic National Park, students will "meet" historical figures who witnessed the volcanic events that occurred in May 1915. Students will listen to firsthand accounts and examine historical photos. Students will act as newspaper reporters, recording information and writing a newspaper article.

GOAL: To introduce students to the impacts of Lassen Peak's eruptions, mudflows, and pyroclastic blasts of May 1915 on the lives of local residents and the surrounding landscape

OBJECTIVES: Students will be able to (1) name at least two people that were affected by the volcanic events of May 1915 and (2) write a short newspaper article describing the events as witnessed by those individuals interviewed.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: One to two hours

LOCATION: The first stop is at Hot Rock along the park road. The second stop is at the Devastated Area; students will then walk the Devastated Area interpretive trail.

MATERIALS: Reporter Question Sheets (one per student), pencils, paper, writing boards or cardboard (optional), Photo Pages of five historic photos, Quotes (Loomis's flood account, Wid Hall's story, Stockton Record Reporter's account of Lost Creek, Loomis's account of big eruption, and Frank Houston's story), and a park map (with Hat Creek and Lost Creek highlighted)

SUBJECTS: History, Social Science, Science, Language Art, Drama

KEY WORDS: Volcanic Eruption, Pyroclastic Blast, Mudflow, Devastated

BACKGROUND: Read and share with your class B.F. Loomis's book Eruptions of Lassen Peak. It contains historical information as well as interesting personal accounts, some of which are used in this activity. This book may be purchased from the Lassen Association by mail.

Lassen Peak's eruption sequence follows:

1. From May 1914 through early May 1915, approximately 170 small explosive steam-blast eruptions were recorded. These eruptions ejected only broken fragments of the old rock from Lassen Peak. On May 16, 1915 new hot black lava filled the open crater. During the night of May 18 or the early morning of May 19, large chunks of hot lava spilled over the crater rim and generated an avalanche of hot lava which melted snow on Lassen Peak. The combination of hot lava and melting snow avalanching down Lassen Peak created a debris

flow (often referred to as mudflow). This debris flow or mudflow consisted of melted snow carrying pieces of hot lava, uprooted trees, mud, and rocks down Lost Creek and Hat Creek.

As the mudflow slowed down depositing its debris, it left a flood of muddy water to continue down Hat Creek. This created a flood which washed out homesteaders on Hat Creek.

2. On May 22, 1915 B.F. Loomis and his party hiked to the Devastated Area and took photographs of the debris (mudflow). They ran out of film and left the area. Running out of film might have saved their lives!

3. A few hours after they left the area, the largest eruption occurred sending a pyroclastic flow (a mixture of superheated gases, pumice, and lava fragments traveling at speeds of over sixty miles per hour) down the already devastated area. This hot blast created additional mudflows knocking down and burning any remaining trees.

Note: You will notice that some of the information given by B.F. Loomis does not match the above eruptive sequence. Loomis was thought to be correct at the time, but scientists have clarified the event sequence since then.

INSTRUCTIONAL SEQUENCE:

DAY BEFORE FIELD TRIP TO THE PARK

1. Assign four students to read one of the quotes from the following characters: B.F. Loomis, Wid Hall, Stockton Record Reporter, and Frank Houston. Pass out the quotes to the students so that they can study their "parts." These will be used on the field trip at the appropriate time and place. Tell the students to act out the characters when they read the quotes. This will add more interest and fun to this activity.

2. Pass out Reporter Question Sheets (to all of the students), pencils, paper, and if desired, writing boards. Have students answer questions on separate sheet of paper. These are to be used the day before and the day of the trip. Have your students practice taking notes on the class portion of this activity titled "Editor's Request." This will make it easier for them to answer the questions on their Reporter Question Sheet.

3. Tell the students you want them to pretend to be newspaper reporters from their hometown. The date is May 25, 1915. They are on a field assignment and must write a newspaper article about the recent eruptions of Lassen Peak when they return to class. The day before and on the field trip, reporters will take notes and answer the questions on their Reporter Question Sheets as their investigation proceeds. It is important for everyone to listen very carefully to all that they see and hear. Remember to take good notes.

4. The teacher plays the role of the newspaper editor and reads the following to the students:
EDITOR'S REQUEST: I imagine you've all heard some of the fantastic stories about Lassen Peak's eruptions and perhaps you've seen some of the exciting photographs. I want you to go there, see the devastation firsthand and come back with a detailed report.

Be sure to find out as much information as possible. Apparently, there are some people who had seen and experienced the eruption firsthand. Be sure to interview them. Now, I imagine you are probably a bit worried about traveling to an active volcano, but don't forget, if you want to produce quality news reporting, you've got to get close to the action. Besides, I checked it out; you'll be safe.

Our newspaper staff has already gathered the following information. On the night of May 18, or in the early morning of May 19, residents in Hat Creek experienced a huge flood. There was lots of muddy water and some debris which swept rapidly down stream. Some think it might have come from Lassen Peak.

When Loomis went up to investigate, he found a huge area completely devastated. All the trees and topsoil had been swept away from Lassen Peak. Along the edge of the flow where some of the trees were still standing, high water had stripped the bark off to a height of eighteen feet. On May 22, the largest eruption yet was witnessed by hundreds of people. A huge mushroom shaped cloud formed over Lassen and was estimated to be 30,000 feet high.

Have the students now answer Question No. 1 on the Reporter Question Sheet.

DAY OF FIELD TRIP

1. Buses coming into the north entrance of the park should stop at the Loomis Museum or get a drink of water, and if desired, have a snack. Then proceed to Hot Rock.
2. Unload the students at the Hot Rock pullout along the park road. Gather the class away from the Hot Rock. Using a park map, orient the students to Lassen Peak, Hot Rock, the Devastated Area, and Hat Creek which flows out of Hat Lake. Explain that Lost Creek is located a short distance behind the Hot Rock.
3. After orienting the class, take them over to the Hot Rock. Introduce them to "B.F. Loomis." Remember the date is May 25, 1915. Have the student who has volunteered to be B.F. Loomis read the following with as much flair as he or she can muster up:

LOOMIS'S FLOOD ACCOUNT:

"We reached the head of Lost Creek about noon, where we found that about all the water had come from the crater in Lassen Peak, which ran down the mountain side like a river. There was a great slit in the rocks on the east side of the peak where the water came from mostly, and all the water ran down on the Lost Creek side. The land on the hillside was well covered with timber before the flood, but the flood carried everything before it and not a tree was left in the path of the flood where it came down the mountain side, and for a long way down the creek. This flood was from a few feet up to eighteen feet deep...as was evidenced by the mud on the trees, and also by the bark which was peeled off, and the trunks of the trees were battered up to that height by the floating debris, logs, trees, and stones as they went flying past. Apparently, about half of the water swirled around and went down Lost Creek, and the other half went down Hat Creek."

“It is no exaggeration to say that the volume of water and mud in the two creeks must have been equal to that carried in the Sacramento River opposite Anderson at flood tide or high water mark. At the lower end of the Adams' place on Lost Creek the valley is about two hundred yards wide and the mud on the trees showed that the mudflow was about twelve feet deep. All the meadow lands on both creeks are covered with rocks and debris, rendering them worthless, and none of the buildings or fences remain. Many large rocks, some of them hot, were thrown from the crater or torn off the lip of the crater on the west side, and carried down the creek by the raging torrents. The largest hot rock we saw was...about 18 feet wide, 20 feet long and I estimated it to be about 14 feet thick. It was carried four or five miles from the crater of Lassen Peak to where it now lies. And after forty hours from the time it left the crater it was still sizzling in the water. Only the largest trees were left standing in the track of the flood, and most of those had the bark peeled off up to high water mark on the side where it came in contact with the floating debris, logs, and trees.”

Show the students the Loomis photo "Hot Rock on Lost Creek" (Fig. 24 in Eruptions of Lassen Peak, Photo No. 1.)

LOOMIS'S FLOOD ACCOUNT: The Jessen place was once a fertile meadow, but now it is a waste of land, with not a vestige of buildings or fences to show where the place used to be.

Show the students the photographs of the Jessen meadow before and after the mudflow and flood (Fig. 38 and 39 Eruptions of Lassen Peak, Photos No. 2 and 3.)

4. Have the students finish their notes on their questionnaire. Give them a couple of minutes to examine the Hot Rock.

5. Students get back on the bus and unload at the Devastated Area. **IMPORTANT:** The Devastated Area trail is used by many people. To make sure your class has no negative impact on this area, it is essential that every student stay on the established trail. This will also promote student safety. Remind the students to continue to take good notes.

6. Gather the students by the large sign in the parking area explaining the eruption history. Read the sign out loud together as a class.

7. Walk students to a spot in the Devastated Area that gives them all a good view of Lassen Peak. Have the class sit down and face Lassen Peak. Tell them Hat Creek is directly behind them. Introduce them to Wid Hall, a homesteader who lives ten miles downstream in the Hat Creek Valley. Have the student who has volunteered to be Wid Hall read the following firsthand account of the flood with gusto. Remember, the story takes place ten miles downstream from where the students are sitting.

WID HALL'S STORY: Mr. Elmer Sorahan was a homesteader living in a tent about a mile and a half above here on Hat Creek. In the night his dog barked, raved, and stuck his paws against him in the bed to wake him up. Elmer thought it might be some kind of animal, a bear, or panther, so he got up and dressed, put on his high top boots and laced them up. He put his gun by the bed, then peeped out to see what the dog was barking at. He saw the mudflow coming like a wave about twelve feet high with what looked like a white streak on top. The flood made a roar something like a gale of wind in

the trees, with a crash and boom of the logs and rocks as they came tumbling along in the flood. He realized that it must be a flood coming, so without waiting for his gun, he left everything and ran down the creek to awaken those who lived below him on the creek.

It was about eleven or twelve o'clock when the flood reached our place. Elmer came with a rush, and he was perhaps five minutes ahead of the wave that struck our house. He gave a yell that startled us, and we all jumped up in a hurry. Frank Bartlett happened to be staying there that night but he was sleeping in the barn across the creek, 150 yards distant. Elmer then ran across the creek to awaken him, and just got back across the creek when the bridge went out. Frank remained on the other side. As soon as Elmer returned he took the two girls, one by each hand, and beat it for higher ground. The older girl, Marian, was fairly well dressed, but the younger one was too slow and had no shoes on, and in their haste she stubbed a toe nail off. The crash and roar of the flood was so intense that you could hardly hear one yell even at a short distance. About three o'clock we tried to get back to the house which had moved 53 feet and lodged against a tree and the yard fence, but could not reach it at that time...

8. Have students finish notes on what happened at Wid Hall's place.

9. Take the class as a group around the Devastated Area interpretive trail. Stop to read the signs along the way. Students can take notes and fill in information on their Reporter Question Sheets as they go. Make it clear to all students that they are to stay on the trail and not disturb anything along the trail. Note: If you have a large class you may wish to break them into two or more groups to walk the trail. This would require that the students reading the quotes be stationed at their appropriate stop and share their story and photos with the student groups as they pass by.

10. Stop at the Giant Boulder sign and introduce the reporters from the Stockton Record. The Reporter is excited about a story he/she just heard and are generous enough to share it with you. Have the student who volunteered to be the Stockton Reporter read the following:

STOCKTON RECORD REPORTER ACCOUNT OF LOST CAMP

We hit Lost Creek at Lost Camp, or rather where Lost Camp used to be.

Now it is truly lost. Lost Camp was the mountain range used by A.J. Herbert. Fortunately, owing to the lateness of the season (there was still too much snow), he had not moved in for the summer, else he might not have been so fortunate as the family of Wid Hall, ten miles farther down from the peak. We found parts of Herbert's house jammed in between two big pines in the middle of a big pond of hardening mud two hundred yards below the spot where it formerly stood.

TEACHER adds: "Herbert was a stockman who used this area for summer grazing. Not any more!"

11. At the Hot Blast sign, stop and read the interpretive sign. Ask the students if you were standing here on May 22, 1915 at 4:00 p.m., would you have survived the eruption?

12. Stop the class at the Loomis Hot Rock sign. The students see Mr.Loomis again who now shares a little about the eruption on the afternoon of May 22 and shows them the Hot Rock

photograph taken by Loomis the morning of May 22, 1915 (Fig. 22, Eruptions of Lassen Peak, Photo No. 4.) Loomis reads:

LOOMIS'S ACCOUNT OF BIG ERUPTION

On our way home that evening when we reached the Manzanita Chute...we witnessed the largest eruption of Lassen Peak which ever occurred. The eruption came on gradually at first, getting larger and larger until finally it broke out in a roar like thunder. The smoke cloud was hurled with tremendous velocity many miles high, and the rocks thrown from the crater were seen to fly way below the timberline before they were followed by a comet-like tail of smoke which enabled us to tell definitely the path of their flight. For a short time the smoke cloud ran down the mountain side, melting the snow very fast, and the water could be seen running down the mountain side in a rush twenty feet wide. But soon after the cloud lifted going straight up so the amount of water running down our direction was slight.

Show the students the photograph of the Big Mushroom Cloud (Fig. 32, Eruptions of Lassen Peak, Photo No. 5.)

13. Have the students finish taking notes on Loomis's story.

14. Stop at the Rock and Roll exhibit sign and introduce Frank Houston. Have the student who has volunteered to be Houston read the following:

FRANK HOUSTON'S STORY:

At the time of the big blowout, on May 22, 1915, I was running a little mill on Hat Creek, about thirty miles north of Mt. Lassen. There came a flood on the twenty-first of May but it was cloudy and stormy so we could not see the mountain. So, four of us, George Hector, Frank Burnell, Roy Houston, and myself, went up the creek to see what the trouble was.

We went to Big Springs that day, where we stayed over night. The next day we crossed Lost Creek and the water was not over four inches deep. But after following up the creek for half a mile we could not go any further with the team on account of the mud that had come down in the flood, so we left the team there and went the balance of the way on foot. We had gone about a mile when the big blowout came on. We stood where we were watching the eruption until we heard the flood coming, and we had to cross the creek to get home, so we started on a run for the team about two miles further down the creek. We then had to drive to Twin Bridges to cross, but when we got there, the flood had beat us, and we could not cross.

We waited for the water to go down, and we had to stay there until about nine o'clock the next morning, and then the water was up to the horses' sides and to the bed of the wagon. Then we went down to Big Springs and got our breakfast, the first we had eaten since the morning before.

Mrs. Bramhall was there and wanted me to take her out, so we packed up her things and went over to Logan Lake, and there we met Wid Hall and family. They said the flood had wrecked their house and barn, so we went down there to see what we could save, but we couldn't get anything, the mud was too deep. So we came back and stayed at Logan Lake that night, and went home the next day.

15. Have the students finish notes on Frank Houston's story.
16. Have the students finish walking the Devastated Area trail and read the rest of the display signs to obtain additional information for their articles if there is time.
17. Gather the class together back in the parking area. Review the information they have heard and noted. Have student reporters share their information with other student reporters. Have the students finalize their notes. This is the end of the activity.

Note to teacher: If you run out of time have the students share their information back in class.

EXTENSION/ENRICHMENT:

(1) The events of May 1915 were similar to the events of Mount St. Helen's eruptions. Read articles about the Mount St. Helen events and compare them to the Lassen events. How were the events the same? How were they different? Why was there such a big difference in the amount of lives lost? (2) Find newspaper articles, books, etc. showing and telling about Lassen's eruptions. (3) Did the eruptions have any affect on the town you live in? If so, what? (4) The location where people settle might mean the difference between life or death. Look at topographical maps of Lassen. Where do you think the affected homesteaders lived? Were all their neighbors equally at risk? Why or why not? (5) What natural disasters could happen in your home area? Can you tell who might be affected and who probably wouldn't? Do you think predictions would always be correct? Are there places you would definitely not build a house? (6) Find out as much as you can about your town in 1915. Read old newspaper articles, look at old pictures, get old timers to come and talk to your class. What was different? What is the same?

ASSESSMENT: (1) Have the students give an oral presentation describing the events or scenes of the eruption as reported by the eye witness accounts. (2) Have the students turn in their Reporter Question Sheets, written articles, and notes. (3) Have the students write a short article about the recent volcanic activity as seen by one of the people they have "met." (4) Have the students compare the historical accounts of May 1915 with their impressions of the area as it looks today.

REPORTERS QUESTION SHEET

1. What have you already heard?

What happened on May 18 and 19?

What did Loomis find?

What happened on May 22?

2. Who did you talk to at the Hot Rock?

Where did he think the water came from?

How deep was the mudflow?

What happened to the trees?

What happened to the Adams' place?

How did the Hot Rock get here?

What happened to Jessen Meadow?

Could it still be used as summer pasture?

3. Who woke Elmer Sorahan up in his tent on Hat Creek?

What did he do when he realized a flood was upon him?

Write notes about what happened at Wid Hall's place.

4. What happened to A.J. Herbert's house and property?

Will he be moving up to graze his animals this summer?

5. If you were standing in the Devastated Area on May 22, 1915 at 4:00 p.m., would you have survived the eruption?

6. Write notes on the eruptions Loomis witnessed on the afternoon of May 22.

Why did he leave the Devastated Area?

Were any lives lost? Why or why not?

7. Write notes from Frank Houston's story.

8. What other information about Lassen Peak's eruption have you learned from walking the Devastated Area interpretive trail?

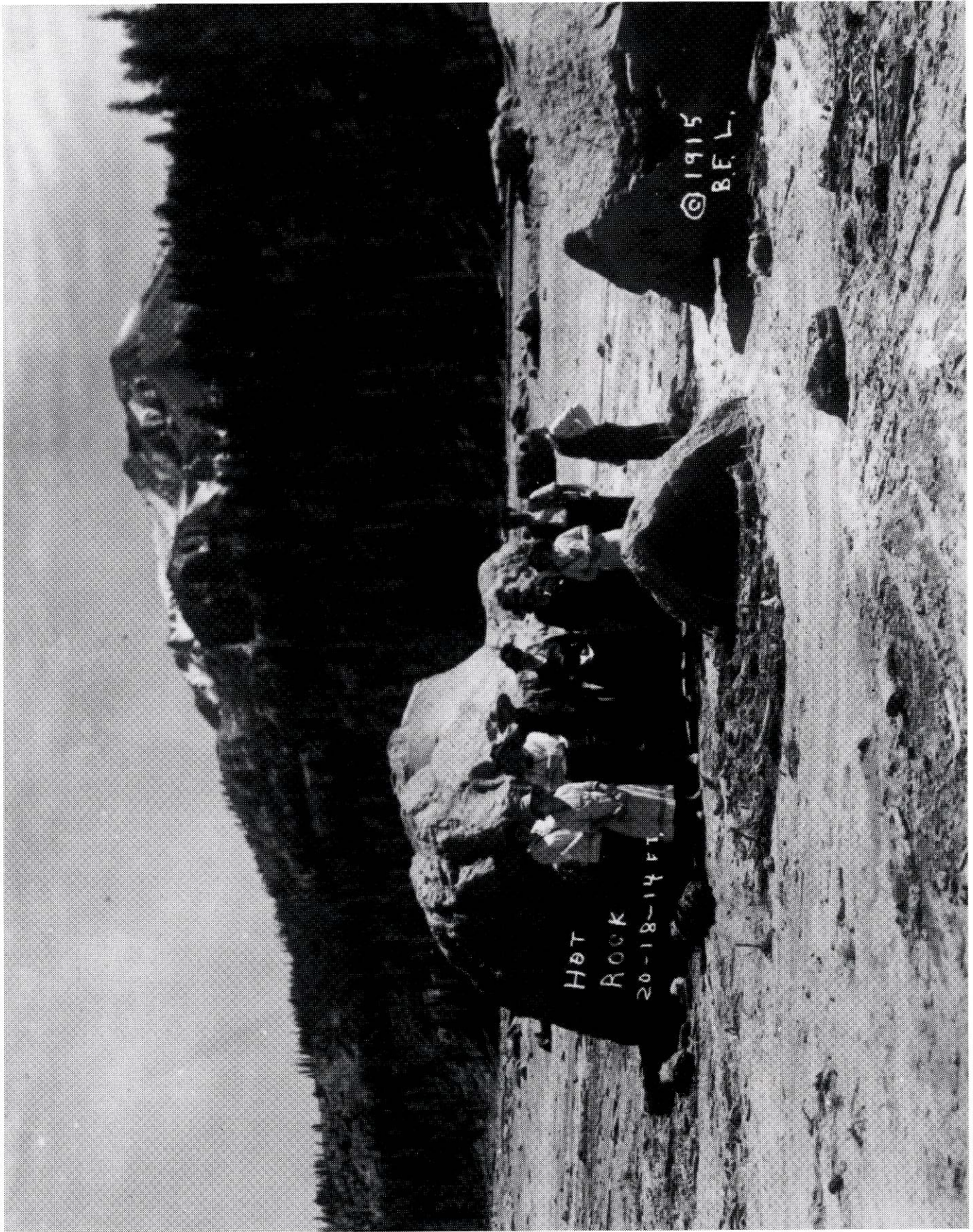


PHOTO 1 - HOT ROCK ON LOST CREEK



PHOTO 2 - JESSEN MEADOW BEFORE 1915 ERUPTION MUDEFLOW



PHOTO 3 - JESSEN MEADOW AFTER ERUPTION AND MUDFLOW

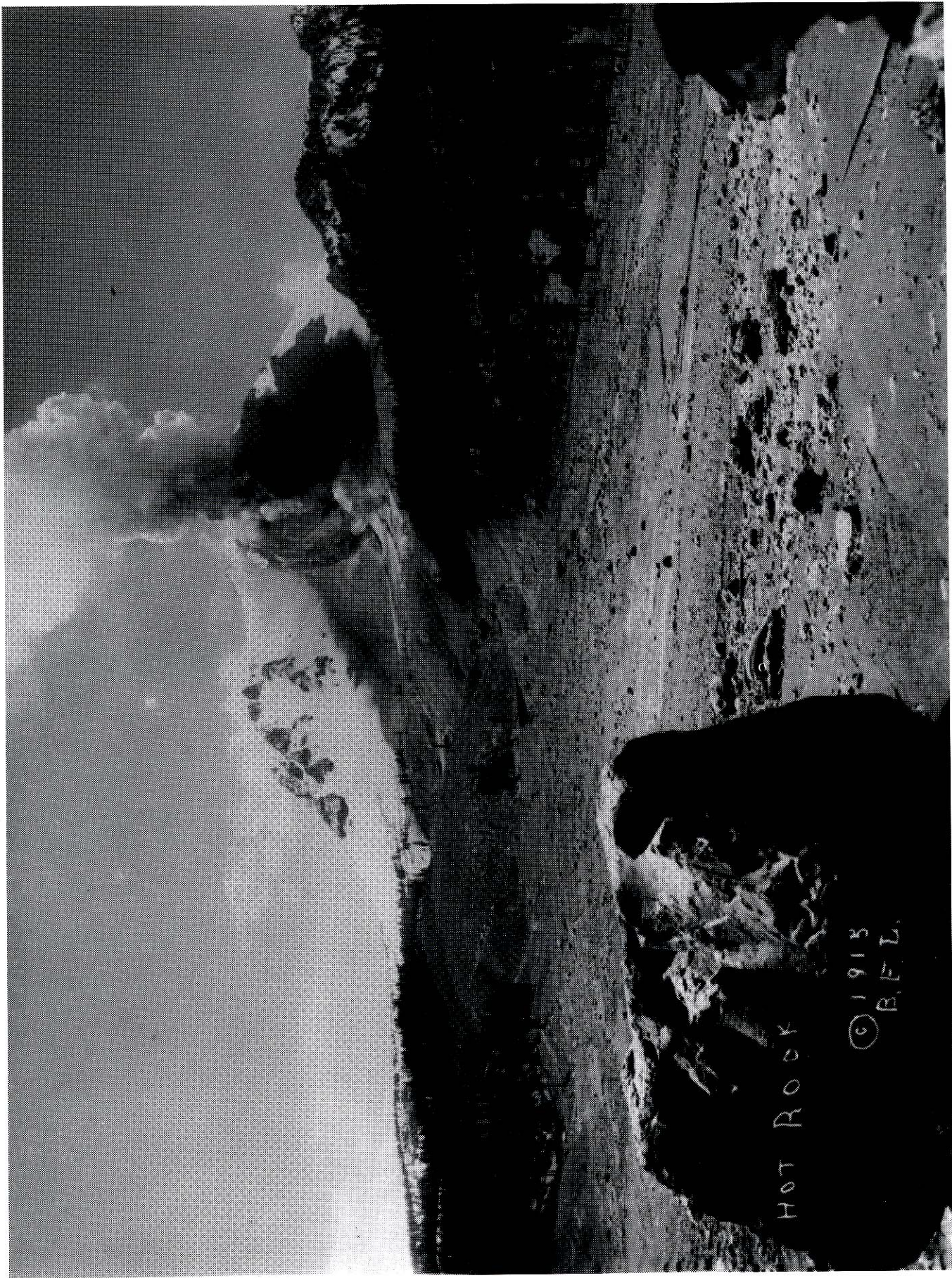


PHOTO 4 - HOT ROCK

ERUPTIVE HISTORY OF LASSEN VOLCANIC NATIONAL PARK CREATING A TIMELINE

SUMMARY: In this activity students will become familiar with the eruptive history of Lassen Volcanic National Park by reading a story and then developing a timeline of the park's volcanic history.

GOAL: To increase student awareness of the volcanic history of the park.

OBJECTIVES: By the end of the activity, students will be able to develop a brief, but accurate timeline of Lassen Volcanic National Park's eruptive history.

GRADE LEVEL: Fourth, through Twelfth

TIME REQUIRED: 45 to 60 minutes

SETTING: Classroom

MATERIALS: Each student will need a copy of the handouts "Eruptive History of Lassen Volcanic National Park: Creating a Timeline" Before and After Lassen Peaks 1914 Eruption, twelve 2" x 4¼" strips of white art paper, glue sticks, colored pens and pencils and/or crayons, and two pieces of 8½"x14" plain white paper.

INSTRUCTIONAL SEQUENCE: Introduce the activity by explaining that each student will read the handouts about the eruptive history of Lassen Volcanic National Park. Explain that they will be responsible for looking for key pieces of information that will be used in the development of two timelines, one for before and another for after Lassen Peak's 1914 eruption. Show the students the strips of art paper and explain that they will be writing their timeline information on them. It is suggested that you create one or two sample timelines to help the younger students understand the concept of a timeline.

Give copies of the handouts "Eruptive History of Lassen Volcanic National Park: Creating a Timeline" Before and After Lassen Peaks 1914 Eruption to each student. Have each student read the stories. The students need to look for key dates and information that will help them develop two accurate timelines. Each timeline strip must contain text that depicts the information they gathered from the reading. Use six strips for each timeline. Students glue finished timeline strips to the 8½"x14" white paper. Students may color and draw pictures above each timeline strip.

EVALUATION/ASSESSMENT: Evaluate by using the **Reporting of Information Rubric**. Also use the “Eruptive History of Lassen Volcanic National Park: A Chronological Timeline” included at the end of this activity as an aid in evaluating the student work.

Reporting of Information Rubric

The primary focuses are attention to detail and accurate reporting of information related to the eruptive history of Lassen Volcanic National Park.

- 4 Timelines demonstrate an in-depth understanding of historical eruptive events that occurred in Lassen Volcanic National Park. Eruptive events featured are in the correct chronological order and are described accurately.
- 3 Timelines demonstrate an acceptable understanding of historical events that occurred in Lassen Volcanic National Park. Eruptive events are featured in the correct chronological order. The written descriptions lack detail but are accurate.
- 2 Timelines demonstrate limited understanding of the historical events that occurred in Lassen Volcanic National Park. Eruptive events are featured, but one or more of the events may be out of chronological order. The written descriptions may lack detail and may not be accurate.
- 1 Timelines demonstrate extremely limited understanding of the historical events that occurred in Lassen Volcanic National Park. Eruptive events may be featured, but they are out of chronological order and may lack organization. The descriptions are poorly written.

Eruptive History of Lassen Volcanic National Park Creating a Timeline Before Lassen Peak's 1914 Eruption

Lassen Volcanic National Park has a long history of volcanoes and volcanic eruptions. Many people think of Lassen Peak as “The Volcano” of Lassen Volcanic National Park when in fact every mountain in the Park is a volcano or part of a volcano. Lassen Peak is just one of many volcanoes that occupy the area designated as Lassen Volcanic National Park.

Between 600,000 and 470,000 years ago a large composite or stratocone volcano called Mount Tehama formed in the southwest portion of what is the Park today. It towered over the area for many centuries. It slowly went extinct and eroded away into its present form with Brokeoff Mountain, Mount Diller, Mount Conard, and Pilot Pinnacle left as reminders of this once great volcano of the past. The Sulphur Works hydrothermal area is where the central vent of old Mount Tehama is thought to have been.

After the extinction of Mount Tehama, a number of lava dome volcanoes (sometimes called plug domes) began to erupt northeast of Mount Tehama between 300,000 and 200,000 years ago. These lava dome volcanoes are familiar landmarks in the Park. They include Ski Heil Peak (244,000 years ago), Bumpass Mountain (about 232,000 years ago), and Reading Peak (approximately 212,000 years ago). Other volcanoes including shield, cinder cone, and more lava domes erupted during the past 100,000 years to form the remainder of the volcanoes found in the Park. Two of these include Eagle Peak (66,000 years ago) and Hat Mountain (40,000 years ago).

Lassen Peak was formed 27,000 years ago. It probably took only a few years to reach its present height. With a height of 2,000 feet from its base and a volume of half a cubic mile, it is one of the largest lava domes on Earth. When Lassen Peak formed, it was probably very steep-sided and covered with rock talus. However, from 25,000 to 18,000 years ago during the last ice age, glaciers altered Lassen's shape. The glacial erosion gouged a bowl-shaped depression on the volcano's northeast flank, called a cirque.

Approximately 1,100 years ago six lava dome volcanoes collectively known as the Chaos Crags Volcanoes were formed in a series of violent eruptions north of Lassen Peak near Manzanita Lake. The volcano called “Cinder Cone” with its Fantastic Lava Beds and Painted Dunes formed in a series of eruptions about 350 years ago. This spectacular volcano is located near Butte Lake in the northeastern part of Lassen Volcanic National Park

Eruptive History of Lassen Volcanic National Park Creating a Timeline After Lassen Peak's 1914 Eruption

On May 30, 1914 Lassen Peak awoke from its 27,000 year-long sleep when it was shaken by a steam explosion. By mid-May 1915 more than 180 steam explosions had blasted out a 1,000 foot-wide crater near the summit of Lassen Peak. Steam explosions or steam blasts occur when molten rock (magma) rises toward the surface of a volcano and heats shallow ground water. The hot water rises under pressure through cracks and on nearing the surface, vaporizes and creates steam explosions.

On the evening of May 14, 1915 blocks of hot lava could be seen bouncing down the flanks of Lassen from as far away as the town of Manton, 20 miles to the west. Between May 14 and May 19 a new lava dome formed in the crater. Late in the evening of May 19, a large eruption shattered the new lava dome sending large blocks of hot lava avalanching down the northeast flank of Lassen. This hot lava melted the large snow pack on the side of Lassen generating a mudflow of volcanic materials, called a lahar, down Lost Creek and Hat Creek. Also during the night of May 19-20, dacite lava erupted filling the new crater of Lassen, spilled over the low spots on its rim, and flowed 1,000 feet down the steep west and northeast flanks of the volcano.

Late in the afternoon of May 22, 1915 after two quiet days, Lassen Peak exploded in a powerful eruption that blasted rock fragments and pumice high into the air, creating the larger and deeper of the two craters seen near the summit of the volcano today. A huge column of volcanic ash and gas rose more than 30,000 feet into the air and was visible from as far away as Eureka, 150 miles to the west. The eruption generated a high-speed avalanche of hot ash, pumice, rock fragments, and gas, called a pyroclastic flow that swept down the side of the volcano, devastating a three square mile area. This pyroclastic flow also created a new lahar of melted snow and volcanic rock pieces that rushed down Lost Creek and Hat Creek. The May 22 eruption also generated additional smaller mudflows on all flanks of Lassen Peak.

For several years after the May 22, 1915 eruption, spring snow melt percolating down into Lassen Peak triggered steam explosions, indicating that rocks beneath the volcano's surface remained hot. Steam explosions in May 1917 blasted out the second of the two craters now seen near the volcano's summit. Steam vents could be found in the area of these craters into the 1950s but gradually died out. Today Lassen Peak sleeps again, but active steam vents, boiling springs, and bubbling pools of hot mud are still found elsewhere in Lassen Volcanic National Park. No one can say when, but it is almost certain that the Lassen area will experience volcanic eruptions again.

Eruptive History of Lassen Volcanic National Park A Chronological Timeline

The eruptive history of Lassen Volcanic National Park is listed below in chronological order.

- Between 600,000 and 470,000 years ago a large composite or stratocone volcano called Mount Tehama formed in the southwest portion of what is Lassen Volcanic National Park today.
- After the extinction of Mount Tehama, a number of lava dome (sometimes called plug dome) volcanoes began to erupt to the northeast of Mount Tehama between 300,000 and 200,000 years ago. These included Ski Heil Peak (244,000 years ago), Reading Peak (212,000 years ago), and Bumpass Mountain (232,000 years ago).
- Other volcanoes including shield, cinder cone, and more lava domes, erupted during the past 100,000 years to form the remainder of the volcanoes found in the Park. Two of these include Eagle Peak (66,000 years ago) and Hat Mountain (40,000 years ago).
- Eruptions about 27,000 years ago formed Lassen Peak, probably within only a few years.
- The Chaos Crags Volcanoes formed about 1,100 years ago.
- Cinder Cone with its Fantastic Lava Beds and Painted Dunes formed approximately 350 years ago.

Lassen Peak History, 1914 to Present

- On May 30, 1914 Lassen Peak awoke from its 27,000 year-long sleep when it was shaken by a steam explosion.
- By mid-May 1915, more than 180 steam explosions had blasted out a 1,000 foot-wide crater near the summit of Lassen Peak.
- On the evening of May 14, 1915 blocks of hot lava could be seen bouncing down the flanks of Lassen from as far away as the town of Manton, 20 miles to the west.
- Between May 14 and May 19, 1915 a lava dome formed in the crater.
- Late in the evening of May 19, 1915 a large eruption shattered the new lava dome in the crater sending large blocks of hot lava avalanching down the northeast flank of Lassen. This hot lava melted the large snow pack on the side of Lassen generating a mudflow of volcanic materials, called a lahar, down Lost Creek and Hat Creek.
- During the night of May 19-20, 1915 dacite lava, somewhat more fluid than the lava dome, filled the new crater of Lassen, spilled over the low spots on its rim, and flowed 1,000 feet down the steep west and northeast flanks of the volcano.
- Late in the afternoon of May 22, 1915 after two quiet days, Lassen Peak exploded in a powerful eruption that blasted rock fragments and pumice high into the air, creating the larger and deeper of the two craters seen near the summit of the volcano today. A huge column of volcanic ash and gas rose more than 30,000 feet into the air and was visible from as far away as Eureka, 150 miles to the west. The eruption generated a high-speed avalanche of hot ash, pumice, rock fragments, and gas, called a pyroclastic flow that swept down the side of the volcano, devastating a three square mile area. This pyroclastic flow also created a new lahar of melted snow and volcanic rock pieces that rushed down Lost Creek and Hat Creek.
- For several years after the May 22, 1915 eruption, spring snow melt percolating down into Lassen Peak triggered steam explosions, indicating that rocks beneath the volcano's surface remained hot.
- Steam explosions in May 1917 blasted out the second of the two craters now seen near the volcano's summit.
- Steam vents could be found in the area of these craters into the 1950s but gradually died out.
- Today Lassen Peak sleeps again, but active steam vents, boiling springs, and bubbling pools of hot mud are still found elsewhere in Lassen Volcanic National Park.

EXPLORING THE GEOLOGY OF LASSEN VOLCANIC NATIONAL PARK THROUGH THE INTERNET

SUMMARY: Students will use the Internet to find sites that have geologic information about Lassen Volcanic National Park.

GOAL: Students will become familiar with the different types of geologic features found in Lassen Volcanic National Park.

OBJECTIVES: By the end of the activity, students will be able to identify and describe at least two geologic features found within the boundaries of Lassen Volcanic National Park.

GRADE LEVEL: Fourth through Twelfth.

TIME REQUIRED: 30 to 45 minutes

SETTING: A classroom setting or computer lab with one or more computers is appropriate for this activity.

MATERIALS: Each student needs one record sheet. Teams of two students can be assigned to one computer.

INSTRUCTIONAL SEQUENCE: Assign this activity as a center for stations or as an individual assignment in a computer lab. Give a brief overview of the expected outcome. (Two students could share a computer and investigate at least one Lassen Volcanic National Park Internet site. Each student will be expected to research the site and find information related to the geology of Lassen Volcanic National Park.) If the activity is assigned as part of a computer lab lesson adjust your instruction to meet your needs.

EXTENSION ACTIVITIES: (1) Have students develop a poster that advertises the Internet site they visit. Students must include a minimum of one geologic fact that they discovered while researching the site. (2) Create a student directory of Internet sites that have information about Lassen Volcanic National Park. Have students write a brief summary about the site. Students can develop a rating system for the sites based on the amount of geologic information found at each site.

EVALUATION/ASSESSMENT: Use the attached rubric to evaluate the students' work.

Name _____

Lassen Volcanic National Park Geology Internet Search

Directions: Select one of the following Internet sites and look for information about the geology of Lassen Volcanic National Park. You may also use a search engine and type in Lassen Volcanic National Park and find a site of your own. Answer the questions listed below. Use a sheet of paper if more space is needed.

Possible Internet Sites:

http://vulcan.wr.usgs.gov/Volcanoes/Cascades/ImageMaps/CascadeRange/cascade_range.html

<http://vulcan.wr.usgs.gov/Outreach/AboutVolcanoes/framework.html>

<http://vulcan.wr.usgs.gov/Volcanoes/Lassen/framework.html>

http://vulcan.wr.usgs.gov/Volcanoes/Lassen/description_lassen.html

<http://vulcan.wr.usgs.gov/Glossary/Domes/framework.html>

<http://www.usgs.gov/education>

<http://www.nps.gov/lavo>

<http://quake.wr.usgs.gov/index.html>

1. Which site did you visit?

2. What does the site describe about the geologic features of Lassen Volcanic National Park? Write a four to five sentence summary.

3. Name at least two geologic features described at the site and write a short two to three sentence description of each feature. Include any interesting facts you learned about each feature.

4. Write a three to five sentence description about any other interesting fact or additional information that you learned about Lassen Volcanic National Park while reading the site.

Scoring Rubric

- 4 The student team or individual successfully located an Internet site without any teacher assistance. Detailed information about the geology of Lassen Volcanic National Park was recorded.
- 3 The student team or individual successfully located an Internet site without any teacher assistance. Information about the geology of Lassen Volcanic National Park was recorded.
- 2 The student team or individual needed teacher assistance in locating an Internet site. Information about the geology of Lassen Volcanic National Park was recorded, but it was brief or not appropriate.
- 1 The student team or individual was not successful in locating an Internet site or needed much assistance in locating a site. Information about the geology of Lassen Volcanic National Park was brief or sketchy and may have been missing altogether. However, the team or individual was focused and on-task the entire time.
- 0 The student team or individual was not on-task. The assignment was not completed.

Notes and Observations

INDIAN ACORN GAME

SUMMARY: Students will hear a story about the Atsugewi Indian use of acorns, learn how to make an acorn top, and play an Atsugewi children's game.

GOAL: For students to learn about the importance of acorns in the lives of the Atsugewi Indian people

OBJECTIVES: Students will be able to (1) name three uses of acorns by the Atsugewi, (2) describe how and when acorns were gathered, and (3) make an acorn top and play a game with it.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: Two 45 to 60 minute periods

LOCATION: Classroom

MATERIALS: Acorns, small sticks about the size of a matchstick, and sharp stones to drill holes in the acorns

SUBJECTS: CA History/Social Science, Language Arts, Science

KEY WORDS: Atsugewi (Aht-zsu-GAY-wee), Acorn, Food Source

BACKGROUND: The Atsugewi Indian tribe (also called the Hat Creek Indians) lived on lands northeast of Lassen Volcanic National Park. Their summer territory included the Manzanita Lake area and much of the northern part of the park. Today, many of the Atsugewi live near the small community of Hat Creek. Acorns were an important food source. They were gathered in the fall when the leaves were changing colors. The Atsugewi people preferred acorns from California Black Oak (*Quercus kelloggii*). The Black Oak is a common species found in lower elevation mountain areas. The acorns from Black Oaks can be stored up to seven years after being dried. Acorns were carefully examined for small holes caused by insects. Good quality acorns have no holes. The Acorn Game was played by the Atsugewi children when there was free time. This game, acorn identification, and top-making skills were taught to the children by the women in their families. Acorns were used for food, jewelry, and as medicine for an upset stomach.

The information in the Acorn Story is taken from the Anthropological Records, 14:2, Atsugewi Ethnography, by Thomas R. Garth, University of California Press, Berkeley and Los Angeles, 1953. An excellent source of information about the Atsugewi is the book Indians of Lassen by Paul E. Schulz, Lassen Loomis Museum Association, Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Discuss the importance of acorns in the lives of the California Indians. Discuss what life as an Atsugewi Indian might have been like before the pioneers came to California. Read and discuss the Acorn Story. Explain that the students are going to make acorn tops. Atsugewi children made acorn tops as toys and used them when playing the Acorn Game.

Acorns will need to be gathered; it is best if students can do this. The best tops are made with short, round, well-balanced acorns. If you are unable to find a source for Black Oak acorns, most other types of oaks found in the Sacramento Valley and surrounding foothills will do, especially Live Oaks. Students will also need a stick the size of a large kitchen matchstick (you may wish to provide matchsticks with heads broken off) and a small pointed rock for drilling a hole in the acorn.

When you are back in class, spread the acorns on a large flat surface so the students can choose their acorns. Explain that they are now going to make their acorn tops. Show them a completed top and demonstrate how to make one. Make sure the students have all the items they need. It is recommended that they make their tops on the floor of the classroom or outside. They begin by drilling a small hole (one fourth to one-half inch deep) in the top of the acorn for the stick to fit in. The top of the acorn is the rounded end opposite the pointed bottom. The hole should be the same size as the stick so the stick fits tightly into the hole. The small stick is then carefully wedged into the top of the acorn. The pointed end is the spinner part of the top that spins on the ground and the stick extends into the air providing balance.

You may wish to make some extra tops in case some of the student tops break or do not work. When the students have finished their tops, they are ready to play the Acorn Game. Atsugewi children used the thumb and forefinger of one hand to spin their tops. Have the children practice spinning their tops in preparation for the game.

To play the Acorn Game divide the class into small groups of four or five students. Spread the groups out around the classroom floor or outside on the sidewalk or other hard surface. Everyone in the group must start spinning his/her top at the same time. The top that spins the longest is the winner in each group.

EXTENSION/ENRICHMENT: (1) Dry acorns and make acorn flour. Leach the flour and make acorn mush and/or acorn bread. (2) Have an acorn shelling contest. (3) Have the students teach younger students how to make acorn tops.

ASSESSMENT: Have the students answer questions based on the Acorn Story. Student acorn tops can also be used as a product in the assessment process. Have the students make another acorn top at home with a parent, relative, or friend. Have them bring the newly made tops to school.

ACORN STORY

The Atsugewi used many different kinds of foods (meat from game animals and many kinds of plants) because no one source provided enough food to ensure that the people would not go hungry. The Atsugewi cleverly learned about many kinds of food and used a great variety.

Acorns were one of their most important vegetable foods. Men or agile girls climbed oak trees and knocked acorns down with sticks or they stood below and knocked them down with longer sticks. Women gathered the fallen acorns in baskets. Black acorns were preferred over white. If acorns were picked slightly green, they were not as good. Acorns were carried in baskets about as big around as a basketball and as tall as two basketballs piled on top of each other. The baskets were so heavy that they had to be moved in stages to the Atsugewi winter quarters.

Many of the acorns were dried in the shell on slabs of bark and stored in pits or granaries. Shelled acorns were stored in large baskets in the cookhouse or outside covered over with bark. Acorn shelling was a social occasion. Young people had contests to see who could shell ten acorns the fastest. They shelled the acorns with their teeth or by pounding the up-ended acorn with a rock, using another rock as an anvil. One person might do the cracking and another might take the shells off; both boys and girls participated. The split acorns were dried on platforms of branches and pine needles, supported on four posts about three feet high. On rainy days a fire was built underneath to dry the acorns.

Acorns were prepared for eating by being smashed in a basket. The flour was sifted by shaking it on a board or flat basketry tray; the larger pieces were separated out and pounded over again. These one and one-half foot square sifting boards were once made from sections of hollow trees ground to the required thickness with stones. The flour was leached in a basin in the sand (later on in a basket topped with flour sacking); cold water was poured through the meal two or three times and then warm water was poured through until it tasted right. The prepared meal could be stored until needed.

To make acorn mush, acorn flour and water were put into a basket with hot stones that had first been dipped in water to remove the ashes. Two forked sticks were used to lift the hot stones. A plain stick served as a mush stirrer. Mush was ordinarily eaten with meat. Each person had his/her own small basket of meat and mush and ate it by making a spoon with the index and middle fingers. To make acorn bread, some of the meal was mixed with water and a small quantity of earth. It was then molded into small biscuits or larger loaves and wrapped in sunflower leaves. The bread was cooked all night in an earth oven. It might keep a week without spoiling and was often taken by men on hunting expeditions.

ATSUGEWI STICK GAME

SUMMARY: Students learn and play the Atsugewi Stick Game, a guessing game played by Atsugewi children.

GOAL: To enrich student understanding of the lifestyle of the Atsugewi indian tribe.

OBJECTIVES: Students will be able to: (1) Explain three reasons why the Atsugewi traveled to Lassen Volcanic National Park in the summer. (2) play a traditional indian game that was played by adults and children. (3) Describe at least three Atsugewi summer activities.

GRADE LEVEL: Third through Fifth.

TIME REQUIRED: Two 45-60 minute periods.

LOCATION: Classroom and/or Lassen Volcanic National Park

MATERIALS NEEDED: 6 sticks (4 to 6 inches long) per student. One piece of bone for each student(a stick 4 inches long can be marked and used in place of bones).

SUBJECTS COVERED: History/Social Science, Language Arts, Science, Visual and Performing Arts

KEY WORDS: Atsugewi (awt soo gay wee), cooperation

BACKGROUND FOR TEACHERS: The Atsugewi people lived northeast of Lassen Park in the Hat Creek valley. In the summer Atsugewi people often traveled to the higher mountains in what is now Lassen Volcanic National Park. Their objectives were to hunt, fish, trade, gather various plants, and to socialize with other indian tribes or families. Children who made the trip spent time exploring and playing active games with each other. Sometime for reasons of safety or because they needed to not disturb adults involved in trading, they played sedentary games. These were times when they needed to stay close to the adults and entertain themselves. The Stick Game was one game they played during these

times. An excellent source of information about the Atsugewi and other Indians of the Lassen area can be found in the book *Indians of Lassen* by Paul E. Schulz. This book is available at Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Have the class gather the sticks needed for the game (6 per student, about 4 to 6 inches long, plus one extra to be used as a bone. In class prepare the sticks. Have the students peel the bark off all sticks. If you decide to use bones, chicken leg bones work well. All of the sticks should be decorated. The bones should be decorated and marked so players can easily recognize them from their six sticks. Suggested markings might include Indian symbols, nature symbols, etc. After students have prepared their game materials, read aloud to them the information brief titled, *Atsugewi Summer Activities*. Discuss the brief and then have them answer the questions listed below. They may need to have copies of the brief available for reference in order to answer the questions. After the sticks and bones are prepared and the questions answered set aside plenty of time for students to play the game as described on the Stick Game Instruction Page. If you are planning a field trip to Lassen you may wish to have them play the game there.

Questions:

1. List three reasons the Atsugewi traveled to Lassen Volcanic National Park.
2. In what ways did the Atsugewi catch fish?
3. Name at least three ways the Atsugewi hunted.
4. Why do you think gathering plants took so much of the Atsugewi's time?
5. What were some of the reasons the Atsugewi gathered plant materials.
6. What were two social activities of the Atsugewi?

EXTENSION/ENRICHMENT: (1) Have the students make up variations of this game and share it with the class. (2) Have them teach other students or adults how to play the game. Have the students draw a picture of Atsugewi summer activities.

ASSESSMENT: Have the students demonstrate and play the game. Use the student answers from the questions to assess their knowledge of Atsugewi summer activities. Have them write a story based on the information brief.

Atsugewi Summer Activities

In the summer when the snow melted in the high country, Indians from throughout the Lassen region traveled to the cool higher mountain areas to trade, fish, hunt, and vacation in the beautiful land that today makes up Lassen Volcanic National Park. The Atsugewi were among those people. They fished for trout in the mountain lakes, but their fishing was very different from fishing with a rod and reel. They speared fish with two-pointed or four-pointed spears. They trapped fish in basket fish nets and also chased them into pools created by partial rock dams, then scooped them out with baskets and nets. They also used a simple hook or series of hooks attached to a line to catch fish.

They hunted rabbit, fox, deer, squirrels, other small mammals and, occasionally, elk and bear. They hunted in a variety of ways including with bow and arrow, spears, snares, knives, by nooses placed along game trails and by driving game into large pits. The Atsugewi bows and arrows were of very high quality because they had a good supply of yew wood.

Gathering various plant materials for food, blankets, medicine, furnishings, and tools occupied a significant amount of Atsugewi time in Lassen Volcanic National Park. For basket making they gathered maidenhair ferns, bear grass, sedges, pine roots, slender willow ends, and juniper. Plant foods included Manzanita berries, sugar pine nuts, tiger lily, wild onion, serviceberries, elderberries, gooseberries, currants, buckthorn berries, and juniper berries.

Socializing was a very important part of the Atsugewi summer. Games were a fun part of the social activity and were played by people of all ages. Many of the games were guessing games with a large variety of wooden sticks used in various ways. Feasts were perhaps the most important social gathering of the Atsugewi and happened whenever there was an abundance of food. Of course, large feasts were scheduled and planned, usually to commemorate a special event, but a particularly successful hunt resulting in an abundance of meat was reason enough to call for a feast. Trading with other Indian tribes was also an important part of the summer social activity. It was an opportunity to obtain plant materials, tools, and other survival necessities not normally available to them.

Summer as with all the seasons was an important time of year for the Atsugewi. It provided opportunities to accomplish things necessary for survival in a world

intimately connected to the earth.

ATSUGEWI STICK GAME INSTRUCTIONS

This game can be played many different ways. After you learn to play the two games described here, you may want to make up your own game.

GAME 1: 2 PLAYERS

Sit down facing each other and put all sticks except the bones in a pile between you. These become score sticks. Each player takes turns hiding his/her bone in one hand behind his/her back. The other player tries to choose the hand where the bone is hidden. If the correct hand is chosen, the player who guessed correctly takes one stick from the score stick pile and places in front of him/her. If the hand chosen is incorrect, the player hiding the bone takes a stick from the score stick pile and places in front of him/her. Then it's the other player's turn to hide the bone and let the opponent guess which hand holds it. A correct guess earns a scoring stick. An incorrect guess means your opponent gets a scoring stick. When one person has all the scoring sticks, that person wins the game.

GAME 2: 2 PLAYERS PER TEAM, 2 TEAMS

In this game, the two players on one team sit closely together side by side facing the two players on the other team who are also sitting closely together side by side. All (or some agreed upon number depending on how long you want the game to last) scoring sticks are placed in a pile between the two teams. The first team passes the two bones back and forth between each other behind their backs for a set amount of time (10 seconds). At the end of the time, the challengers must guess which team member has the bones. If they guess correctly, they move a scoring stick in front of them. If they guess incorrectly, their opponents move a scoring stick in front of them. Then the other team has to pass and hide the bone until the given time is up and their opponents guess where it is. A correct guess earns a scoring stick. An incorrect guess means your opponents get a scoring stick. When one team has all the scoring sticks, they are the winners.

ATSUGEWI VILLAGE

SUMMARY: In small groups, students will make a model of houses used by the Atsugewi including: earth lodge, bark house, and summer residence.

GOAL: To learn more about the lifestyle of the Atsugewi by building some of the structures of a typical village.

OBJECTIVES: Students will be able to: (1) Describe the three homestyles used by the Atsugewi and for what purposes each type was used. (2) Explain what materials were used in the building of each of the three structures. (3) Demonstrate their knowledge by building a model of an Atsugewi home.

GRADE LEVEL: Third through Fifth.

TIME REQUIRED: two 45-60 minute periods.

LOCATION: Classroom.

MATERIALS NEEDED: Bark, twigs or small sticks (gathered from dead and down material, not live trees), and mud, clay, or other like material to cover the earth lodge surface. Twigs or small sticks must be straight to provide framing for the structures. Large pieces of flat cardboard to make the houses on(2ftx2ftor3ft.x3ft). Size of materials used to make the houses depends on classroom space and size of cardboard.

SUBJECTS COVERED: History/Social Science, Language Arts, Science, Visual and Performing Arts.

KEY WORDS: Atsugewi (awt soo gay wee), earth lodge, bark house, summer residence

BACKGROUND FOR TEACHERS: Background information is contained in the student brief, Atsugewi Houses, which is taken from information contained in the Anthropological Records, 14:2, Atsugewi Ethnography, by Thomas R. Garth, University of California Press, Berkeley and Los Angeles, 1953, and *Indians of Lassen* by Paul E. Schulz. The Indian Ways Nature Trail located at the north entrance to Lassen Volcanic National Park off of State Highway 44. The Indian Ways Nature Trail has life sized examples of all three of these Atsugewi homes.

INSTRUCTIONAL SEQUENCE: Explain to the students that they are going to learn about the Atsugewi's by building a model of their homes and village. Have the students read the student handout, Atsugewi Houses. Have the students answer the following questions. Discuss their answers as a class.

Questions:

1. If you were a wealthy Atsugewi, what kind of a house would you live in during the winter?
2. Who might live with you in your winter home?
3. What kind of a home would you have during the summer?
4. If you were a poor Atsugewi, what kind of house would you live in during the winter? During the summer?
5. Who would help build an earth lodge for a family?
6. Which of the three kinds of Atsugewi houses do you like the most? Why?

After answering the questions, divide the students into groups of 2, 3, or 4 per group. Assign each group a type of Atsugewi home from the three types described in the handout. Or let the students choose which house they would like to build and then divide the class into groups. You may wish to have the students gather the materials needed as a homework assignment and build the houses in another class session. After all the materials needed are gathered, then have each group plan and build their Atsugewi house as described in the handout. Houses could be built outside if space was available. Have each group share their house with the class. Note: If the class is small you may wish to have the students build their own house instead of in groups.

EXTENSION/ENRICHMENT: (1) Research and make other Atsugewi structures. (2) Share your "houses" with other classes. (3) Use your houses to make a display of Atsugewi homes for your school, community, a local museum, or local business that has display space. (4) Have the students make a village with the houses.

ASSESSMENT: Completion of the houses and student answers to the questions provide samples for assessment. Have the students give oral presentations about the lifestyles and environment associated with the houses and the Atsugewi culture.

ATSUGEWI HOUSES

Atsugewi lived in mountain meadows with rivers, streams, and forests surrounding them. It was a land dotted with volcanoes and other volcanic features. The Atsugewi used three main types of housing, earth lodges, bark houses, and simple summer residences. Earth lodges were the most elaborate and substantial buildings. Earth lodges and bark houses were both used for winter homes while branch and brush enclosures to keep wildlife away from food and other belongings were used for summer homes.

Earth lodges were dug into the earth about three feet deep. Large posts formed a frame to support smaller framework. Planks, split logs, and bark were used to cover the frame. The entire structure was covered with a layer of dirt. The roof was covered with a thick layer of grass and dirt. An opening was left in the roof near the strong center support post serving as an entrance and smoke hole. A ladder made of stout logs and rungs tied together with serviceberry withes (thin, flexible branches used to tie things together) was placed through the entrance hole beside the center support post. A heavy mat was placed over this opening or, in really bad weather, a slab of bark was used. A low entrance was placed at the front of the lodge which served as a ventilator shaft and entrance for children. This entrance was closed with a screen of woven willows or tules with grass stuffed behind the screen at night to shut off the drafts. With this limited ventilation, the fire would burn down to coals and keep the lodge warm all night without additional fuel. Friends and relatives helped a family build an earth lodge. The women used digging sticks to excavate the pit while men built the rest of the structure. It often took two or three weeks to build one of these homes. Several families might live in a large earth lodge, each being assigned to their own space. People slept on mats made of tules and used blankets made from deer and elk skin, woven rabbit skins, patchwork rabbit or fox skins, and loose tule or grass.

Bark houses were used as winter houses by poorer people. These were built over pits about 6 inches deep. A square or rectangular wooden frame was built with bark placed on the framework. Dirt was piled high along the base to keep out the cold. A fireplace was located in the center of the floor under a smoke hole in the roof. In the middle of one of the longer sides a doorway was left, which was closed with a tule mat. Another design simply had center supports with logs and bark leaning against them, and dirt piled along the base of the bark walls.

Summer residence was the name given to Atsugewi summer camps. They were circular enclosures of brush, juniper, or other conifer limbs or of rock. They were ten or fifteen feet across with openings to the east. There was no roof, although branches and bark slabs might be put over simple frames in rainy weather.

ATSUGEWI SUMMER CAMP

SUMMARY: Students working in small groups perform various tasks necessary for establishing an Atsugewi summer camp.

GOAL: For students to develop an understanding of the Atsugewi Indian way of life and their use of the environment

OBJECTIVES: Students will be able to (1) describe at least three activities involved in setting up an Atsugewi summer camp, (2) name at least three animals that were hunted and explain how these animals were used, and (3) compare and contrast modern camping needs with those of the Atsugewi.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: 60 minutes

LOCATION: Manzanita Lake or Lily Pond Trail

MATERIALS: Student Activity Page (one per group), pencil, paper (lined and unlined), and a clipboard or something to write on. Optional but useful are local natural history field guides about mammals, birds, tracks, and trees.

SUBJECTS: History/Social Science, Language Arts, Science

KEY WORDS: Atsugewi (Aht-zsu-GAY-wee), Survival

BACKGROUND: The Atsugewi people relied on a broad awareness and understanding of the environment to meet their everyday needs. Since no single resource could sustain their people, they used a variety of resources in their quest to survive. This activity provides the students with an opportunity to make decisions based on their awareness of the environment as a survival skill.

It is best to complete the three Atsugewi activities (Indian Acorn Game, Atsugewi Village, and Stick Game) before visiting the park and doing this activity.

INSTRUCTIONAL SEQUENCE: Prior to your visit, engage students in a discussion about a family camping trip. What will they eat? Where will they get their food? How will they prepare it? What will they use for shelter and for sleeping? What clothes will they take? What camping tools and utensils will they need? What other tools and/or recreational equipment might they bring? List responses on charts and post them around the classroom.

Explain that on the field trip the class will be choosing a summer camp like the Atsugewi did in their summer migration to what is now Lassen Volcanic National Park. Divide the class into Atsugewi family groups of five or six students each. Have groups decide on a name for

their family. Go over the Student Activity Page with the students so they clearly understand what they are to do at the park. Go over simple mapmaking skills since each group will make a map of their site. Make sure students are clear about proper behavior and park rules.

When you arrive at the park, define boundaries and time limits. Distribute the Student Activity Page. Have students proceed on the trail in their assigned family groups.

When the students are back in class, post the camping charts the students generated before the field trip. Develop a similar chart based on student experiences in setting up an Atsugewi summer camp. Record all responses and have the students compare and contrast camping today with Atsugewi summer camping.

EXTENSION/ENRICHMENT: (1) Put the maps made by the groups together in an organized presentation and share it with another class or a community group, and/or set up a display for a classroom, school, or community site so others can learn from your experience. (2) Have the students draw a picture of what their Atsugewi summer camp would look like.

ASSESSMENT: Have each student write a narrative or story describing the establishment of an Atsugewi summer camp. Make sure they include information on fishing, wildlife, and other survival considerations. Maps and field notes should also be incorporated into the assessment of this activity.

STUDENT ACTIVITY PAGE

The class is part of the Atsugewi Tribe that has traveled to this beautiful site to spend the summer. This is a new area that scouts have determined to be "a good place" to camp. You will work together in your family groups and select a summer camp location. As a group you will walk the trail looking for the "perfect" site based on the following needs for survival. . Your group will draw a map of the lake or trail area, noting landmarks and places of importance (for fishing or wildlife sightings). Pick one person in your group to be the mapmaker. Place the location of your summer camp on the map. Make sure the map is clear and readable so other classmates can follow it without your help.

You will need to complete the tasks described below so your summer camp will meet your survival needs. Please read them over before starting out on the trail so you will know what to look for before you begin. Each student must take field notes that relate to the tasks. **All tasks required for this activity must be completed by staying on the trail.**

1. Locating a Summer Dwelling Site. Each group must find a good site for setting up their summer camp. There needs to be enough space to make homes for two or three families. Remember, Atsugewi summer houses were small enclosures no more than ten or fifteen feet in length. Make a list of reasons why you chose the spot you did. What makes it a good site? Decide where your houses will go. Draw the location of your camp on your map noting any landmarks.

2. Signs of Wildlife. Will there be any meat on the tribal table if you camp in the area? The animals hunted included deer, rabbits, squirrels, and other small mammals. Mammals provided more than just food; they provided bones, fur, and hides to meet other survival needs. Birds were also hunted for food and feathers. Waterfowl such as ducks and geese were hunted as well as grouse, woodpeckers, and colorful song birds. Look for any signs of wildlife and record what you see. It takes keen observation. **BE VERY THOROUGH!** Remember, the family's survival depends on your skills. Think about what method you would use to hunt the area's different wildlife. Methods included hunting with bows and arrows, knives, or spears, placing nooses along game trails, driving game into large pits, and snaring game. Write down the preferred hunting method next to any wildlife or signs of wildlife you have observed and recorded.

3. Fishing. Fish provide a very important source of food. Locate the best fishing sites for all the different ways Atsugewi fished. Methods included spearing fish with two-pointed or four-pointed spears, fishing with a simple hook or series of hooks attached to a line, and trapping fish in basket fish nets. Fish were also chased into pools created by partial rock dams and then scooped out with baskets and nets. When you find the fishing sites for the different types of fishing techniques, mark on your map where they are and the technique you would use. Note: If your group uses the Lily Pond Trail, you will have to pretend that there are fish in Reflection Lake and Lily Pond; there are no fish in these places.

4. Other Survival Necessities. Look around the area and list anything else in the environment that might be useful in meeting your survival needs. What might you use or make tools from? What plants might be useful and for what purpose? Describe anything you find or discover.

AMERICAN INDIAN TRAILS

SUMMARY: Students hike the Bumpass Hell or Devils Kitchen Trail or other trails and record field notes on a specific habitat. Back in class they write a story, legend, or myth based on their notes.

GOAL: To increase student awareness and understanding of the American Indian culture and its rich kinship with the environment

OBJECTIVES: Students will (1) record at least ten field observations about a specific habitat, (2) develop and answer at least five questions based on their observations, and (3) write a story, legend, or myth based on their field trip experiences.

GRADE LEVEL: Third through Fifth

TIME REQUIRED: One to three hours onsite and one to two hours in the classroom

LOCATION: Devils Kitchen Trail (activity can be easily modified to use on other park trails)

MATERIALS: A pen or pencil, paper, and a writing surface (pieces of cardboard work well)

SUBJECTS: History/Social Science, Language Arts, Science

KEY WORDS: Story, Myth, Legend

BACKGROUND: The American Indians that live or lived in the area surrounding Lassen Volcanic National Park represent four tribal groups. The Maidu people lived to the south and east of the park. The Yana & Yahi people lived to the south and west of the park. The Atsugewi lived to the north and east of the park. Depending on the specific trail and site the students use, the Indian people may have walked, camped, hunted, or traveled in the area where the students will be walking.

INSTRUCTIONAL SEQUENCE: Tell the students that storytelling and legends have been an important part of the American Indian culture for centuries. These stories were woven from their everyday experiences and their close interdependence with the Earth. Explain that the students will be part of a tribe as they walk the trail. They will be Indians discovering their world. Divide the students into groups of four or five. Assign the groups the following habitats: water, forest, hydrothermal area and other highlights of the specific trail used. It is highly recommended that the teacher hike the trail before bringing up the students. Explain that while on the hike each student is to observe and take field notes on what he/she sees, hears, smells, and experiences in the assigned habitat. Students must stay on the trail while completing this assignment.

While visiting the habitat, each student is to develop and write down five questions about the habitat and things they observe on their walk. These questions will be answered back in class. These need to be open questions. A closed question has a short answer. An open question has a longer answer that requires more thinking and that may have more than one answer. Open questions often begin with how, what, or could, but not always. For instance, "what color is the most common flower in the meadow?" is a closed question. An open question is "what do you think causes the flowers in the meadow to grow where they grow?"

Explain that after the field trip the students will be required to write a story, legend, or myth based on their field notes. They will also have to answer their questions. Their questions and answers may be used in writing their stories. Make sure everyone is clear about the assignment.

At the trailhead, please review proper behavior and park rules. Establish a time limit for the hike and the activity. Have the class break up into their assigned groups and begin the hike. The groups will stop at their assigned habitats. The teacher may wish to spread the groups out along the trail. Stress the need for quiet and stillness in order to see wildlife.

Emphasize the need to stay on established trails and boardwalks and to follow all park rules. Back in class have the students answer their questions and then write a story, legend, or myth based on their experiences, observations, and questions. You may wish to have the students share their stories orally if time permits.

EXTENSION/ENRICHMENT: (1) Have the students draw a picture based on their story or experiences. (2) Have the students write a poem or song based on their story or their experiences on the trail.

ASSESSMENT: Student field notes, questions, stories, and presentations provide excellent samples for assessment. Simple questions about the park and the Maidu Indian culture could also be developed that provide for assessment for this activity.

GETTING PREPARED - PIONEER SURVIVAL KIT

SUMMARY: Students re-live the thoughts and emotions of early emigrants as they prepare for the great journey west to California. They decide what their family should bring in their own personal wagon. They join a "wagon train" and choose a wagon master. They must pare down their personal items for the good of the whole group placing varying degrees of importance on each item.

GOAL: To introduce students to the decision making process necessary to prepare for a journey across the country in a covered wagon and what supplies would be needed by the travelers

OBJECTIVES: Students will be able to (1) list twenty important items needed for the five to six month journey to California and (2) explain the importance of each item.

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: One to two hours

LOCATION: Classroom

MATERIALS: Paper, pencils

SUBJECTS: History and Social Science, Language Arts, Group Dynamics, Home Economics

KEY WORDS: Emigrant, Survival, Decisions, Hardship

BACKGROUND: Read any of the following books to gain a better understanding of what life on the trail was like: Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

If you or your students have any diaries of ancestors coming to California, these would add personal interest!

Most of the wagons used by emigrants were about ten feet long, four feet wide, and two feet deep. This box-like structure was covered by a curved canvas top that was tall enough for a person to stand upright in the center of the wagon. The goods were stacked about four feet high on either side of the wagon with a narrow path in the middle. Sometimes extra storage pockets were sewn in the canvas and an extra false bottom was added with foot deep storage compartments under the floor. Barrels and boxes were attached to the outside of the wagon to carry bulky items, water, extra tools, and wagon parts.

Emigrants who could afford it sent their large, valuable and/or breakable articles to California via ship around Cape Horn. This made packing their wagon much easier. For

many others this was not an option. They had to sell and leave behind many of their prized possessions. Either way, the essential items were about the same--non-perishable food, kitchen and cooking utensils, bedding, clothing, medicine, rope, tools, extra wagon parts, guns, ammunition, lamps or candles, and sewing needs. Optional items varied greatly and often included musical instruments, books, and a child's favorite doll.

The food eaten along the trail was very limited. Not only was the space to carry food on a five to six month journey small, but without refrigeration or preservatives only certain foods would keep. Naturally, the emigrants supplemented their stores with fresh meat such as buffalo, deer, rabbit, squirrel, or whatever they could hunt. Some of the emigrants or their scouts learned about edible plants from the Indians or previous explorers, however most of them did not have this knowledge. Food could sometimes be replenished at the few trading posts and forts along the way but that could be costly. Standard supplies in most wagons were salt port or bacon (packed in bran to try and keep it from going rancid, although it often still did), about 200 pounds per person of wheat flour, a bushel per person of dried apples, sugar, salt, a leavening such as saleratus, coffee, tea, and sometimes dried corn, dried beans, and rice. Because the last three items took a long time to cook, they were only cooked on layover days where abundant fuel was available. If a cow was brought along, fresh butter and milk were appreciated.

Due to hardships as the trip progressed (wagons breaking, too much weight in the wagon, bad roads, poor weather conditions, or family members dying), unnecessary items were often disposed of along the trail. Sometimes even whole wagons had to be left behind. The emigrants were faced with tough decisions the entire length of the trail and had to help each other.

INSTRUCTIONAL SEQUENCE:

1. Brainstorm and list on the blackboard human needs for survival such as food, water, shelter, and warmth.
2. Discuss how the emigrants might have met these needs in their journey across the continent.
3. Tell students to imagine they are embarking on such a journey. Have each student list the items they would pack in their wagon being sure to meet their survival needs and being as specific as possible. For example, they cannot just list food. They must tell what kind of food and how much, what kind of clothing they would bring and how much, what cooking utensils they would need, etc. See the background section for more information.
4. Divide students into "families" of four. The four individual students have fifteen minutes to pool their lists together and make a new family list. They must remember that everything must fit in their wagon. If it does not, they might not make it to California. See background information for size. They must agree on what to take and what to leave.
5. Bring the "families" together into a "wagon train." Who is going to make the crucial decisions for the group? The "wagon train" must now pick a wagon master. Let them

decide how they will pick that person. After the wagon master is picked, have his/her supporters tell why they think that person will make a good leader for the wagon train.

6. As often happened along the Nobles Trail, disaster strikes your wagon train. Due to the lack of fodder for the oxen, excessive heat, and heavy loads, some of the oxen have died. There are not enough of them to pull all the wagons. One wagon will have to be left behind. Whose wagon will it be? (The teacher should pick a group.) What will the group do with all the supplies and people that were in that wagon? What will be left behind with the wagon? The "wagon train" must come to a satisfactory conclusion that is agreeable to the group as a whole.

7. Discuss the group dynamics that went with the decision making on the family level and on the group level. Is there more than one solution? How was the conclusion reached? Is it satisfactory to everyone? Would it have made a difference if it had been another family's wagon?

EXTENSION/ENRICHMENT: (1) Have each student, then "family" estimate the weight of their proposed wagon load. (2) Measure out the actual size of a wagon. Draw it on the pavement. Pack all the items necessary for a trip across the country in this space. You can estimate the size of some articles and use empty boxes. This will give an idea of how it all fits. (3) Build a small scale replica of a wagon. Fill it with small scale food, clothing, tools, household items, water, medicine, and whatever else you think you will need. Items can be made from cardboard, construction paper, doll toys, clay, etc. (4) Check your local museums and historical societies to see old wagons and articles that were brought out to California in wagons. (5) Read Patti Reed's Doll. Look in the school library for other books on emigration to California. (6) List the following on a blackboard--dried beans, salt pork or bacon, coffee, tea, flour, sugar, salt, dried apples, saleratus (leavening agent), milk, and butter. Have the students figure out how much a family of four would need to bring on a trip across the country? Brainstorm about what could be made from these ingredients. Have each student design a daily menu, complete with recipes. Given these ingredients, have each student make something at home and bring it to school for a "feast." Students could add one or two extra ingredients that might have been brought along in the wagons as treats or found along the trail such as cocoa or fresh blackberries, etc. These should be approved by the teacher. (7) Make an "emigrant" dinner at school using only ingredients that were available to the emigrants. Use cooking methods and kitchen utensils that were used at that time along the trail. Biscuits can be baked in a dutch oven which is put on hot coals with hot coals placed on its lid. (8) Have the students dry fruit or vegetables such as apples or pumpkin. (9) Grind wheat berries or corn in a hand or small electric flour mill. Make something with the home-ground flour. Once corn or wheat is ground it goes rancid more quickly. Some emigrants probably brought dried corn and wheat berries and ground them when needed. (10) Discuss ways to preserve meat for a long journey. (11) Make jerky. (12) Make butter by shaking cream in a jar. Emigrants made butter by attaching churns of cream to the wagons; the bouncing would make it into butter.

ASSESSMENT: List 20 of the most important items that were taken on a wagon trip by emigrants to California. Write one sentence on why each of these items was important to the emigrants.

EMIGRANTS WEST

SUMMARY: Students will "meet" a typical pioneer family traveling the Emigrant Trail in the 1850s through a dramatic role-playing presentation.

GOAL: To introduce students to the hopes and hardships of a typical pioneer family traveling west in the 1850s

OBJECTIVES: Students will be able to describe: (1) A typical pioneer emigrant Family who chose to make the trip west. (2) how they traveled, and (3) what hazards they faced.

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: 30 to 45 minutes

LOCATION: Classroom

MATERIALS: Costumes for actors

SUBJECTS: History, Economics, Language Arts, Visual/Performing Arts

KEY WORDS:

Fort - a way-station to rest, make repairs, send and receive mail, and purchase or barter for supplies. These were not Army forts, but commercial establishments.

Dutch oven - a popular type of cast iron pot with lid that was used for baking and cooking directly on a campfire. Lewis and Clark used one on their expeditions. They probably got the name "Dutch" oven because Dutch salesmen supplied them to the emigrants.

Wagon - the main mode of transportation for the emigrants which was covered with canvas (painted for waterproofing) and was four by twelve by three feet deep. Wagons were purchased or built at home before departure. Iron straps reinforced stress points and iron rims on the wheels were used as tires.

Buffalo chips - dried buffalo wastes burned for cooking fires when wood was scarce on the Plains. Pioneer women were at first embarrassed to deal with them but were pleased to find they provided a hot, smokeless fire. Fires were built in a trough dug into the ground and pots were set across the sides of the trough.

Emigrants - families, traders, entrepreneurs, criminals, and seekers of religious freedom who journeyed to Mexican California and Utah, and the British-controlled Oregon Territory. They were called emigrants because they were leaving the United States as it then existed. The name "stuck" even after California was admitted to statehood.

BACKGROUND: Mountain men, fur traders, and explorers were the first Europeans to see the lands west of the Mississippi. By the early 1800s, their stories were contributing to a growing campaign to make the West part of the United States.

Factors that intensified interest in the new lands included economic depressions of 1837 and 1841, collapse of the international fur trade, British domination, missionaries anxious to spread Christianity, and the Mormons' New Zion in Utah.

It was not until 1841 that the first groups of emigrants left the banks of the Mississippi to head west. By 1843 nearly 1,000 had made the trip. Registers at Fort Laramie and Fort Hall showed nearly 400,000 travelers by 1852.

Guidebooks were soon available for the emigrants. Some had useful information; others were written and sold by people who never made the trip. The need for essential traveling items led to a flurry of trade at the main trailheads of St. Louis, Independence, and St. Joseph in Missouri and Council Bluffs in Iowa.

For the 2,000-mile trek, emigrants needed a wagon, tools, food stores, cooking utensils, bedding, and items for their new homes and businesses. Cash was needed to replenish supplies at the forts and for ferries and tolls. Everything had to fit in a 48 square-foot wagon bed. Sleeping was done outdoors or under a tent in bad weather.

Timing of departure was very important. Late spring was the preferred time because there would be water and grass for stock. Hopefully, the last mountains would be cleared before snowfall.

Landmarks were looked forward to, both to break the monotony of the trip and mark progress. Chimney Rock and Scotts Bluff marked completion of the first third of the trip. After a week's journey, Fort Laramie was reached. As migrants approached the Continental Divide, grass and water became scarce, the rough travel took its toll on the wagons, and buffalo herds--which supplied fresh meat and chips for fuel--became harder to find. Families were often forced to leave belongings along the trail to lighten the load.

South Pass was the halfway mark. Letters and diaries often mentioned that people were hardly aware they were on a pass at first, because of the gentle grade. Beyond lay a barren stretch, then the mountain passes that opened on California and the Oregon Territory.

At first, the Indians were curious, sometimes helpful, and anxious to trade with the travelers. There were few real stories of attacks, mainly on lone travelers. Stock and supplies did, however, disappear during the night on occasion. Resentment, frustration, and problems with some tribes increased later due to increased impacts on their lives from settlements, the railroad, and government policies.

Peter Lassen and William Nobles established trails leading into Northern California. Lassen hoped to bring weary newcomers to his Bosquejo Rancho (near present day Vina) where he had started a town and ran a small store. Nobles had scouted a better route, and was then

commissioned by Shasta City businessmen to establish, advertise, and lead a group through it. Lassen's trail acquired some derisive nicknames, due to the extra miles and reputation for getting people lost. Lassen himself had to be rescued at times. Nobles' trail contributed to the founding of the towns of Susanville and Redding. Both trails played a major role in shaping the development of Northern California.

INSTRUCTIONAL SEQUENCE: This activity requires that two students perform the skit while the rest of the class listens carefully. All of the students answer the three questions under "Assessment."

The following preparation needs to be done before the skit is ready to be performed.

(1) Review script. (2) Explain to the class that you would like two volunteers (one boy and one girl) to play the parts of pioneer emigrants traveling west for a skit to be performed before the class. Explain the reason for the skit. (3) Select actors. Skit Characters: Jacob and Ida Bell Taylor and their "baby." (4) Make or collect costumes. Jacob - old floppy hat and suspenders, beat-up shoes, worn shirt, and dungarees (there were no zippers in the 1850s). Ida Bell - bonnet or scarf, calico dress (to the ankles), apron, old shoes. Baby - doll or towel wrapped in a blanket. (5) Distribute scripts; practice roles. (6) Ask actors to write their lines on note cards OR prepare an overhead transparency of the script which can be projected on a screen behind the audience (a make-shift teleprompter). Use different colored pens for each actor's lines. You will need a "prompter" to move the script along for the actors. (7) Have the actors practice staging--entering the room, walking as if really tired, where to stop and speak to the audience, and exiting the room. (8) Once the actors are ready, announce to the class, "You are about to meet some important people--people who have decided to shape their own future by traveling 2,000 miles across the deserts, plains, rivers, and mountains of our country. The year is 1852; families are packing up and selling out to join the wagon trains in the westward migration. Most don't realize that they are helping to shape the future of the new frontier, California and the Oregon Territory." (9) Explain to the students that they need to listen carefully as they will have to answer some questions about the emigrants after the skit is over. (10) Begin the skit.

Suggestions for the teacher: (1) You may wish to begin the unit by asking the students if they were born in California, where their families (or ancestors) came from, and how and when their families emigrated to California. (2) If costumes cannot be borrowed or found somewhere, ask a few students to try making simple ones from felt, cardboard, or real calico and fabric glue. (3) If any of your students have seen the pioneer program at Lassen Park, they might be good candidates for this presentation. (4) If the "actors" can provide their own make-up to look dirty and sunburned, it would add a realistic touch. (5) You could also do this yourself as a monologue, by changing hats and voices. (It could be fun!) (6) Encourage the actors to stay in character despite some of the things their classmates might say. Suggest they "ad lib" some if needed.

EXTENSION/ENRICHMENT: Music - Listen to or sing popular songs from this time, such as songs by Stephen Foster or railroad and mining songs. Write some new verses to "Clementine" or "Sweet Betsy From Pike." Language Arts - Design or improve a mode of transportation; then prepare a three-minute sales talk for a group of prospective westward migrants. Videotape interviews with grandparents who have stories and keepsakes from their ancestors' migration to California. Social Studies - Research how the pioneers governed themselves while en route and how they dealt with the wrongdoings of others. Find out what the most common health problems were among the pioneers. What medical help, medicines, or herbal remedies were available to them? History - Use maps to explain how and when California and the Oregon Territory became part of the United States. Performing Arts - Students perform skits based on their own research of the lives of pioneer emigrants.

ASSESSMENT: Have the class answer the following three questions and then discuss their answers as a group. (1) Who chose to make the trip and why? (2) How did the pioneers travel? (3) What hazards did they face?

SKIT

Jacob: Well, howdy folks! I thought I saw a campfire out this way. Me and the Missus are scouting for some fresh water. Hope we didn't disturb you none. I'm Jacob Taylor and this here's Ida Bell with our baby. We're from Missouri...taking the Noble's Trail over toward Shasta City. Is that where you-all are from? Our group is staked out under the trees out yonder, resting the stock and starting dinner.

Ida Bell: Now, Jacob, don't go talkin' the ears offen these folks. I do apologize for interrupting your chores...I know I've got plenty of my own once we get back to camp....feedin' the oxen, washin' and mendin'. Jacob, you need to soak those wagon wheels...they got so dried out they shrunk and the iron tires just fell off!

At least I don't have to gather those buffalo chips for the fire anymore, like when we was out on the plains. Not a stick of firewood for miles! You all know what buffalo chips are, don'tcha? Well, like I was telling Mama in a letter, I wouldn't have touched them, not to mention talked about them to strangers before the trip, but that's what trail life does to a person. You do what you gotta do, or sometimes you just don't eat!

Jacob: Now look who's chattering up a storm! You'll have to forgive us, folks, but you're the first Californians we've met. After all these months on the trail, we're down right excited to be so close to our new land.

I was a printer back home and I'm aiming to start a newspaper in a California town. My press is crated up and going around the Horn on a ship bound for San Francisco. Should catch up with it by Spring. Don't mind tellin' you I couldn't find work back home...those cities are so crowded and dirty anyway, it seemed like making a new start was just the thing for my little family.

Ida Bell: I don't mind tellin' you this half of the little family was sorely tempted to turn right around and head back when we was on the plains. Why, that blisterin' sun made our faces peel and lips crack...the alkali water killed a few oxen in the group ahead of us. And the bad tempers!...men and women alike were using language I hope to never hear again. With no wash water, the baby's diapers had to be scraped and dried, then used again. Sure don't miss those dust storms...all day and all night...I thought I was going crazy.

Jacob: Heard tell of a few people who did go crazy. John Lewis's wife got so mad she set the wagon on fire! Abner Blackburn's missus just set herself down in the trail and refused to budge until he turned the wagon around, and they were all the way to South Pass...the half-way mark!

Ida Bell: Well, dear, she was broken-hearted about losing their child in that stream crossing. Can't say as I blame her. Stream crossings are bad enough...havin' to build a raft for the wagons, then haul them over one by one. The stock are forced to swim across and you can just imagine how stubborn they can be. It takes a full day, sometimes two...and still you lose a few animals. But to lose a child, well, that was more misery than she could bear.

I just can't bear it to see the graves along the trail...all those dreams...now turned to dust. Cholera's what did it mostly. I told Mama in my last letter, I said not to worry, we're takin' doses of a little something that was recommended for the cholera.

Jacob: We worried the graves might be from Indian attacks, but they haven't been a bit of trouble. Sometimes a horse or some food disappears at night, but mostly they leave us alone. We circle the wagons at night, but mostly to corral the stock, not cuz' of Indians. Course, we're in a big group...paid plenty to our guide, too.

Ida Bell: It was worth every penny, Dear. We heard a couple of folks travelin' alone got attacked, so we did the right thing.

Jacob: Packing light was the right thing, too. The wife spotted crates and boxes of beautiful things, china and furniture and the like, just litterin' the sides of the trail. People just couldn't carry 'em up those mountains.

Ida Bell: Jacob, Jacob, we must let these people be! You folks have been very kind, but we should let you get back to work. I need to start our dinner, anyway. At least the butter's made. I just milk the cow in the morning and hang the churn on the wagon. The swaying of the wagon churns up a nice little lump of butter just in time for dinner!

I'm sure happy my Jacob is on hiz' feet again. When he stumbled in that prairie dog hole and give his ankle a hard twist, why he had to ride in back o' the wagon! It fell to me to drive those onery oxen and set up the tent at night, all while holding the baby!

We should be in Shasta City by week's end! Soon I'll be cooking in our own home! Course, I had to leave all my pretty wedding china and silver with Mama; they wouldn't fit in the wagon. All I've got now is a kettle and an iron pot. Course, there's not much to cook in them...we've still got a bit of rice and beans left, some vingar for the scurvy, and flour and tea. We traded for some sugar and coffee back at the Fort, but they didn't last long. Why, the forts aren't Army forts at all! Just places to rest up and buy more supplies. Sometimes Jacob gets us something for supper, like a rabbit or a deer, but not too often.

Jacob: Well, Sugarplum, like I was tellin' you, game along the trail is getting harder to find. Why I heard that just a few years back, these lakes were covered with geese and ducks. Their wings made a thunderous roar when they took flight, and you could feel the breeze on your face. And I heard the fish were so thick in the streams you could cross over by walkin' on their backs. I guess it's not like that anymore, what with all the travelers and all...

Ida Bell: The register at Fort Laramie said that 30,000 people, 7,000 wagons, and 50,000 livestock passed through ahead of us! We'd better hurry on now Jacob, before all the land is taken up and spoiled, just like back home.

Jacob: Well, it's still better than back home. Such beautiful forests and clear streams, and such good soil! Us newcomers will remember to take care of the land, so what happened back home won't happen here. You'll see, Darlin'.

Ida Bell: I suppose, Dear. Why these folks here seem to be right prosperous, so maybe it will be better than back home. It would mean a lot to us to raise our children in a land with such promise. Now Jacob, we must go. Good-bye, friends. Thanks for the visit and please wish us well!

Jacob: So long! Good health and fortune to you!

(Exit)

TRAVELING WEST - HARDSHIPS AND CHALLENGES

SUMMARY: History comes alive! While traveling on foot along the historical Nobles Emigrant Trail in Lassen Volcanic National Park students will listen to excerpts from emigrants diaries. They will then experience some of the same hardships and challenges through teacher-led activities.

GOAL: For students to gain an appreciation for what life was like for the early emigrants who traveled the Nobles Emigrant Trail

OBJECTIVES: Students will be able to (1) list at least three hardships faced in daily emigrant life on the trail and (2) write a paragraph in first person depicting life on the trail through the eyes of an emigrant child.

GRADE LEVEL: Fourth through sixth

TIME REQUIRED: You have four options depending on where you go and the time available.

OPTION 1. (1 to 2 hours, 1 to 2 miles) From where the bus leaves you on the park road at the Emigrant Trailhead, take the class part way up the Emigrant Trail. When half your time is gone, return along the trail to where the bus dropped you off.

OPTION 2. (3 to 4 hours, 4 miles) Have the bus drop you off at the Emigrant Trailhead. Hike the four miles of Emigrant Trail west and have the bus pick you up at the Manzanita Entrance Station. You can picnic along the way.

OPTION 3. (1 to 2 hours, 1 to 2 miles) From the Butte Lake and the Cinder Cone trailhead, hike along the Nobles Emigrant Trail as far as desired, returning along same trail.

OPTION 4. (2 to 3 hours, 3 to 4 miles) Do Option 3, adding a hike up to the top of Cinder Cone. This is quite steep and is not advisable for all groups just as it was not climbed by all pioneers who came via this trail. However, some of the pioneers ventured to the top to get their bearings and admire the view. If you have a willing and able class, this is a great hike. PLEASE STAY ON THE TRAIL AND CARRY WATER.

LOCATION: See above options. If it is not possible for your class to go to Lassen Park, this activity can be done at any local state, county, or city park with trails.

MATERIALS: Student Worksheet (one per student), pencils (one per student), lined paper and hard surface to write on or journal, Team Leader Instruction Page (one per group), Pioneer Quotes (one set per team leader), extra pair of socks (and shoes in wet weather) to leave on bus, and extra clothing if weather dictates (leave on bus).

Each student should have a day pack with the following items brought from home: two bandannas or scarves large enough to tie on his/her feet, extra pair of lightweight shoes

which are either one size too large or small for that student, pioneer food (see background information), filled water bottle or canteen, and lunch (optional).

SUBJECTS: History, Social Science, Science, Language Arts

KEY WORDS: Emigrant, Pioneer, Hardship

BACKGROUND: Read any of the following books to gain a better understanding of what life on the trail was like: Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

If you or your students have any diaries of ancestors coming to California, these would add personal interest!

Foods eaten along the trail were very limited. Considering the length of their journey, emigrants had very little space to carry food. No room for extra delights! Also, of course, they had no refrigeration or preservatives. Standard fare was usually salt pork or bacon, biscuits, dried beans (which could only be cooked on layover days where there was lots of fuel), dried apples, and coffee. If they were lucky enough to have a cow along, fresh butter or milk was available. Of course, they tried to supplement their rations with fresh meat such as buffalo, deer, rabbit, squirrel, or whatever they could get. Only a few emigrants learned about edible plants from the Indians or previous explorers. Most of them did not have this knowledge. Food could sometimes be replenished at the few trading posts and forts along the way but that could be costly.

INSTRUCTIONAL SEQUENCE: It is highly recommended that the teacher visit the site and walk the trail before bringing the students to the park.

Before the field trip, have the students prepare and pack an "emigrant snack." Each snack package should contain enough for a team of four students and one leader. Each package should consist of cooked dried beans, biscuits (preferably a day or two old), bacon, coffee or tea, and dried apples.

Before the field trip, divide your students and adult leaders into groups of four students per adult leader. Make a schedule showing when each team starts on the trail.

Before the field trip, meet with the adult team leaders and go over the Team Leader Instruction Page, their time to start on the trail, and any other information and expectations for the trip.

Onsite Nobles Emigrant Trail:

1. Enter the park at the Manzanita Lake Entrance. Stop at the Loomis Museum or Manzanita Lake picnic area to use the restrooms. After a quick stop, proceed on the park

road a few miles south to the Emigrant Historical Marker which is a large turnout on the right side of the road just south of Road Marker No. 60. Have the bus drop your class off. There is a large open area where you can gather your class together. Make sure the students have their day packs and all needed supplies (including lunch if you plan to have it on the trail). They should leave a change of socks, shoes, and any extra clothes not needed on the bus.

2. Divide the class into their teams. Make sure each team leader has the Team Leader Instruction Page. Groups should start out at a staggered rate of approximately two to five minutes apart so there is some feeling of isolation while walking along the trail.
3. The Emigrant Trail takes off from the other side of the road at Marker No. 60, approximately 100 yards back towards the Jumbles Area. Each leader should take their team across the road and start up the trail in their assigned order. The teams that are waiting to start can work on questions marked "Bus Stop." The first teams to start can do these questions while they are waiting at the end of the activity.
4. Each team will proceed down the trail following their Team Leader's directions. There are no specific spots for the stops. This gives each class leeway to adjust to its own time constraints. Try to stop where you cannot see another group. If your class will be doubling back on the trail to meet the bus at the Emigrant Historical Marker, do all the stops on your way out and walk quickly back being sure not to disturb the other teams that are still working. If your teams will be hiking the four miles to the entrance station, the stops should be spread out farther apart along the trail. (Use five minute interval for hikes doubling back, ten minute intervals for the longer one way hike.)
5. When all groups have completed the trail and their worksheets, gather the class together and discuss their experiences, how they felt about the activity, and how they would feel if they were actually emigrants on the trail.

Note: If your class is going to Butte Lake/Cinder Cone, follow the Team Leader Instruction Page and No. 5 from above.

EXTENSION/ENRICHMENT: (1) Have each student write a first person account of what life on the trail might have been like. (2) Read Patti Reed's Doll. (3) Read any appropriate excerpts from books listed in the background section above. (4) Research the different emigrant trails to California. (5) Research clothing and food eaten along the trail. (6) Have students play the computer game called Oregon Trail. (7) Make a replica of a wagon as a class project. (8) Have each student research how their own family came to California. (9) Get a guest speaker from the local historical society to share experiences of local emigrants.

ASSESSMENT: Each student will complete questions on the activity sheet along the trail and participate in a group discussion at the end of the onsite activity. List three hardships experienced by the emigrants on the Nobles Trail. Write a paragraph in the first person depicting life on the Nobles Trail through the eyes of an emigrant child.

TEAM LEADER INSTRUCTIONS

Each team leader will need to bring one set of quotes (A through F) on the trail.

Depending on when your group starts the trail (determined by teacher), you will have time at the beginning, end, or on both sides of this activity. While waiting, have the students in your group answer the two things under Bus Stop. If your group finishes them, pretend that you are a scouting group and explore the nearby vicinity, taking notes on anything that you think might be of importance (and why) to your wagon train.

When it is your turn to start, walk down the trail for approximately five minutes. Try to pick your stops so you cannot see another group. If that is not possible, try to orient yourself so that when the students are looking at you, they will not see the other group.

Stop 1: Read Quote A. Tell students that you would like them to use their imaginations and pretend they are emigrant children walking the trail in 1853. As a warm up activity, have the students do an "Emigrant Walk." The adult leader will start on the trail and walk approximately 30 feet. The first student will start, following the Team Leader and staying 30 feet behind him. When the first student has walked 30 feet, the next student will start. Repeat this procedure for each team member. This will make a single file line where each participant is 30 feet apart but within sight of the team member in front of him. There should be no talking along this section of the trail so that each student can experience the feeling of solitude.

Stop 2: After the Team Leader has walked for approximately five to ten minutes, stop and gather the group together. Have the students answer the questions listed under Stop 2. Walk for five to ten minutes.

Stop 3: Stop and read Quote B. Ask them the following questions. Do you think the trail looks the way it looked to the emigrants? How old do you think these trees are? Do you think the same type of trees grew here in 1853? Do you think there were this many trees then or could it have been more open? What might be the same now as then? Why? What might be different? Why? Walk quietly along the next stretch of trail (five to ten minutes) noticing things that might be the same or different.

Stop 4: Answer the questions listed under Stop 4. Walk for five to ten minutes.

Stop 5: Read Quote C. Ask each student to find a protected "sleeping" spot and lay down there. Without talking, students should stay in their spots about two minutes and imagine what it might have been like to sleep in a similar manner but in different spots along the 2,000-mile trail, for six months. They can then answer questions under Stop 5. Hike five to ten minutes.

Stop 6: Stop for a pioneer snack break and read Quote D. Answer questions listed under Stop 6. Walk for five to ten minutes.

Stop 7: Read Quote E. Have the students put on the extra pair of shoes they brought in their pack (these should be one size too big or too small). Walk down the trail for a few minutes.

Stop 8: Have students answer questions listed under Stop 8. When done, they can remove their shoes and tie the bandannas onto their feet. Read Quote F. Walk down the trail for a few minutes. Note: This should be done near the end of the hike, especially if the ground is wet or the weather cold, so students can immediately change into dry socks and shoes when they reach the bus.

Stop 9: Back at the bus. Students should answer the question listed under Stop 9 plus do the two things listed under "Bus Stop." Have students change into dry clothes if necessary.

STUDENT WORKSHEET

Bus Stop: Things to do while waiting at the beginning or end of this activity.

1. By the time the emigrants reached what is now Lassen Volcanic National Park, they were nearing the end of months of hardships and adventures. They had experienced excessive heat, extreme cold, wet weather, dry deserts, blowing winds, hunger, fear of the unknown, the loss of almost everything they knew or had, sickness and maybe even the death of loved ones. Put yourself in their shoes. Imagine that your wagon train has stopped here (where the future Lassen Park will be) and you are resting. As you look around, write a short paragraph on what you might have thought about as you approached what would be your new home.

2. If your family decided to emigrate across the country to a place that was wilderness and you could only take what fit into your family car, what would you take and why? List at least 20 items. Be specific!

Stop 1: Try to imagine what it was like leaving everything and everybody you knew behind and going along a virtually unknown trail to an unknown new home. Think about this as you do the "Emigrant Walk." Follow your Team Leader's directions.

Stop 2: Describe your feelings as you walked alone along the trail. Do you think that the emigrant children had the same feelings as you did today? Why or why not?

Stop 3: Discussion with Team Leader.

Stop 4: What do you think this spot looked like when the first emigrants came along? Name three things that might be different. Name three things that might be the same.

Stop 5: What sounds might you have heard at night? Do you think the pioneer children were ever afraid of the dark? Do you think they got used to sleeping outside?

Stop 6: Would you like to eat this food day after day? Do you think the pioneer children liked it?

Stop 7: No questions

Stop 8: Have you ever outgrown a pair of shoes and still had to wear them? What could you do to be more comfortable? What do you think the emigrants did? How would you like to walk 10 miles a day in shoes that don't fit?

Stop 9: Have you ever worn moccasins? How do you think they would compare to bandannas?

PIONEER QUOTES

Quote A: "On the trail and into the unknown. Aside from the thoughts of home (on which we do not dare to dwell too much for fear of that dread distemper homesickness) and what may wait us at the end of the road--our thought, our hopes, our fears, and our anxieties are all centered about the train--the health and spirits of the company, grass and water for the oxen, and in a limited way, fuel with which to cook our meals. Rumors of hostile Indians are floating in the air most of the time, and while we pay little attention to them, we cannot altogether dismiss them from our minds, so that you can see that the world in which we actually live scarcely extends beyond the dust of the train by day and the smoke of the campfires at night." John Benson

Quote B: "For some time now we have been traveling through very rough country, where there is very little level ground though the scenery in many places is inspiring and unusual. The forest is open making it easy to move our wagons. The open forest is dotted with big trees and there isn't much brush. We have traveled 15 miles and still haven't found water."

Quote C: "Getting use to sleeping in unknown places has been hard. You must cultivate the habit of sleeping in any kind of surroundings, on a board, in a wagon, or outside under the stars. I think the sounds or lack of sounds at night make for feeling uncomfortable. I'm not sure which is worse."

Quote D: After stopping for the winter Lucy Rutledge Cooke joined a wagon train headed west with her infant daughter and husband: "Our company now consists of six wagons, thirty-seven head of cattle and three horses. Mrs. Holly rides in a light horse wagon as we did last year. Directly we joined this company Holly put three yoke of fine cattle on our wagon, which is only lightly laden, having but five sacks of flour besides our bed and clothing. I assure you it is somewhat different to riding behind cows. Why, we travel right along, through mud, over mountains, snow, or anything that happens to come next. So, as I before said, so far as teams are concern (and surely that's the main thing) we have made a happy change. But we live very poorly. The bacon is awful--so musty--and no vegetables; nothing but bacon, bread, and dishcloth coffee. Oh, how I missed the milk and butter that Greeleys had. William has tried around the camp and has got a cow to milk and has the milk for his trouble, so as long as its owner travels with us I shall have plenty. And now I have five pounds of butter, which is choice as gold. I got it off Greeleys when we left them. I should not have been thus favored, but I happened to have a pair of new leather shoes I bought in the valley for three dollars, and as one of their women folks was near barefoot, they were glad to make the trade. So they paid the half in butter at 30 cents per pound, and the accommodation was mutual, for I did not need the shoes."

Quote E: "Shoes or a lack of them was a problem. To keep what's left of our kids shoes soft enough to wear through the day, it was necessary to soak them in water every night. With all this walking on such rough ground it's amazing that anyone even has any shoes left."

Quote F: "When weary travelers' shoes wore out they had to wrap their feet in any cloth they might have or be willing to tear apart. With all those sharp rocks it was easy to tear up your feet or worn out shoes. The lucky ones bartered for moccasins from Indians or trappers."

EMIGRANT LIFE ON THE TRAIL

SUMMARY: Students prepare costumes and props, and then act out mini-plays portraying various aspects of emigrant life on the trail.

GOAL: For students to gain an understanding of the daily chores and responsibilities of emigrant life along the trail to California

OBJECTIVES: Students will be able to (1) Describe daily chores of emigrant life and (2) Compare these chores to their own chores today.

GRADE LEVEL: Fourth, fifth, and seventh

TIME REQUIRED: Four hours (two in the classroom and two at Lassen)

LOCATION: Classroom and Lassen Volcanic National Park

MATERIALS: Large pieces of cardboard, sheets of butcher paper, paints or crayons, pencils, clothing and props from home (optional), scripts of mini-plays (included with activity), books visually depicting emigrant life (optional), and video camera (optional).

SUBJECTS: History, Social Science, Drama, Art

KEY WORDS: Emigrant, Responsibilities, Chores

BACKGROUND: Lassen Volcanic National Park has a rich pioneer history. Approximately 23 miles of the historic Nobles Emigrant Trail run through the park. Many of the emigrants traveling to California and specifically into Northern California used this trail. Students are asked to depict scenes from emigrant trail life. The short scripts and mini-plays portray some of the responsibilities and chores of daily trail life. Hopefully, the mini-plays will share moments of what life was really like for those traveling the long and hazardous trail to California.

Library, or textbooks with pictures of life on the trail would be useful. Reading appropriate excerpts from any of the following books can help "set the stage." Nobles' Emigrant Trail by Robert Amesbury, Covered Wagon Days by Lucy Rutledge Cooke, The Overland Migrations by the National Park Service (Handbook 105), Oregon Trail, The Story Behind The Scenery by Dan Murphy, and The California Trail by George R. Stewart.

INSTRUCTIONAL SEQUENCE:

PART I - CLASSROOM

1. Share the following information with your class:

Many of the emigrants who came to California via the Nobles Trail were not newcomers to moving. Some were restless adventurers, others kept moving farther and farther west in

search of the ideal homestead. However, their early moves had been through semi-settled land. This last move was through harsh and unsettled lands and involved greater distances and hardships. Luckily, most emigrants were accustomed to hard physical work from homestead life, so they were well prepared for the tough physical work of trail life.

Wagon trains were like small villages on the move. A good day of travel was fifteen miles. The rest of the daylight hours were spent setting up and taking down camp, as well as daily chores. Labor was divided up, and everyone had to do their share. Men usually did all the work associated with moving the animals and livestock, herding the cattle, hunting, and fishing. The women took care of the food, laundry, small children, and cleaning. Older children helped their parents with all chores. The lines between men's and women's work became blurry on the trail. By necessity, whoever was able to do it, had to.

By the time the emigrants reached what is now Lassen Volcanic National Park, they were near the end of many months of hardships and adventures. They had experienced excessive heat, extreme cold, wet weather, dry deserts, blowing winds, hunger, fear of the unknown, the loss of almost everything they knew or had, sickness, and maybe even the death of loved ones. There were also good times, beautiful scenery, newborn babies, marriages, new friendships, and proud feelings of accomplishment. Through it all they had worked hard just to survive. The class will have the opportunity to experience small pieces of emigrant life.

2. Divide the class into groups of five students. There are five parts in each mini-play. This is adjustable as are the scripts.
3. Give each group a script for one mini-play and have them read through it. Each student picks a part. Each mini-play will be about two to three minutes long. After familiarizing themselves with their scripts, students can add additional lines or actions. Students should try to be creative and personalize their plays as much as possible.
4. Have each group discuss different props they could use to make their play more realistic. Suggestions include but are not limited to (a) murals on butcher paper which can be hung up between two trees (remember to bring string and scissors), (b) scenes on large pieces of cardboard that can have the sides folded back so that the piece will stand up, and (c) props and costumes brought from home. Reading through the scripts will give you more ideas.
5. Give groups adequate time to design, make, and collect their props.
6. Teachers may want to use extra students or students who are shy to help with costumes, props, and cameras.
7. On the day after props have been made and collected, students should go outside, weather permitting, to practice their mini-plays. Have them spread out on the playground so that they will not interfere with each other. They should go through their mini-play a number of times until they are familiar with their parts.
8. If performing this activity at Lassen, have each group carefully package their scripts and props in a box to be taken on the field trip to the park.

9. If your class is unable to perform their plays at Lassen, then any other state, county, or city park could be used. Schools can also use their own school grounds and may wish to invite other classes or parents to watch.

10. If time allows, students can play emigrant games.

NOTE: When all the work was done, and if they had enough daylight and energy, emigrant children often played games. Since they were not able to bring much with them, they had to use their imaginations. Here are some of the simple games they played.

"Indians in their tipi's"

Break the class into groups of 10 to 15 students and have them stand in a circle. Pick one student to read the following rhyme, pointing to a different player with each word. The rhyme should be repeated twice. The player that is pointed to on the last word, the last round, is the Indian "it."

Heater, beater, Peter mine,
Hey Betty Martin, tiptoe fine,
Higgledy-piggledy, up the spout,
Tip him, turn him, round about,
One, two, three;
Out goes he!

Another jingling rhyme which can be used:

One-ery, two-ery, hickory Han,
Phillisy, follisy, Nicholas John;
Spinkum, spankum, winkum, wankum,
Twiddlum, twaddlum, twenty-one.
O-U-T, out,
With a white dish-clout-out!

The chosen Indian draws circles on the ground. These are tipi's to hold the players who are caught. Meanwhile, the other students will be the emigrants and chose a base. This can be a rock or tree and is their safe wagon. The Indian tries to tag (catch) the emigrants. The emigrant caught, stands in a tipi circle. They cannot escape unless tagged by another free emigrant. Once an emigrant is freed, the Indian can not catch him again until he has returned and tagged his wagon base. The Indian can, however, tag the emigrant who set the captured one free. The last emigrant to be caught is the Indian for the next round.

"Hop, Step, Jump!"

Divide the group into groups of five students. Each student picks a rock or small stick to be used as a marker later. Each group draws a line on the dirt, and then stands in a line behind it.

Taking turns, one person goes through the complete Hop, Step, Jump sequence before another group member starts. The first student in each group takes one hop, landing on one foot, making sure his/her raised foot does not touch the ground. When the student is balanced, he/she takes a giant step with the raised foot. Finally, the student jumps with both

feet together, marking the spot with his/her rock or stick marker. Continue in this manner, giving each group member a chance. The winner is the one who went the farthest. Note: If desired, have all the group winners compete against each other, continuing until you have a class winner.

Other games which can be played are "Hide and Seek," "Kick The Can" (or pine cone), and "Tag." Challenge the students to think of other games to play.

PART II - MINI-PLAY PERFORMANCE

This activity can be done at a number of locations at Lassen. An excellent location to begin this activity and park a school bus is the turnout just south of the Emigrant Trailhead on the Lassen Park Road. At this spot is a historical marker commemorating the Nobles' Emigrant Trail and a huge open area ideal for the mini-plays; it is located just off the Nobles' trail and was most likely a campsite for the early travelers. Other possible locations include Manzanita Picnic Area, Emigrant Pass at the Devastated Area, Lost Creek Campground, Butte Lake Picnic Area, or the Southwest Campground.

1. Gather students in the open area. Divide them into the same mini-play teams used to practice in the classroom. Give each team their scripts and prop box from the classroom preparation.
2. Define the area you want them to stay in. Give all groups 15 minutes to set up their props, get costumes on, and rehearse if desired.
3. When all groups are ready, gather the class back together. Decide the order to view mini-plays. (This could be done before the field trip.)
4. View each mini-play together as a class. Hopefully you will be able to videotape each play for classroom viewing later. Photographs can also be taken and used for a bulletin board display in the classroom or for open house.
5. After each mini-play is presented, discuss the various aspects of emigrant life that were portrayed. Compare the chores done on the trail with chores that are done today. What are some similarities? What are some differences?

NOTE: Much of the dialogue in these plays comes from actual pioneer journal entries!

EXTENSION/ENRICHMENT:

Students make up their own mini-plays, or modify these to meet their own interests. Ask families to share any artifacts or diaries they have. Have students research how their families came to California. Research emigrant or pioneer chores such as cooking, washing, candle-making, weaving, spinning, patchwork, fire-making, soap making, blacksmithing, etc. Students can make up other scripts dealing with music and evening entertainment, gathering water, bathing, night duty, meeting Indians, and storytelling either to children around the campfire or to another wagon train met on the trail. This is a good way to share interesting tales you come across in research.

ASSESSMENT: Have students describe three daily chores done by emigrants while traveling on the trail. Compare chores that were done on the trail with chores they do now. What are some similarities? What are some differences?

MEAL PREPARATION SCENE

Actors: Mother, 12 year-old Sue, Widow Sarah, 8 year-old William, 3 year-old John, baby (use doll)

Scene: Mother is stirring a pot and tending the cooking fire, John playing hand games with Sue, baby lying on blanket watching, Widow Sarah mending clothes, William sulking in the background, then teasing Sue and John.

Mother: I sure appreciate your help, Sarah.

Widow Sarah: Working together has sure made it easier for both of us. I don't think I could do this by myself, with Frank gone. (Sighs) I sure miss him.

Sue: Mother, please tell William to stop!

Mother: William, if you don't stop, you'll get the switch. I'm too tired to have to talk to you about your behavior.

William: (Coming over to the fire) I just wanted to play too. When are we going to get there? I'm tired of traveling. It's so much the same every day. I want to be there. I thought we were in California already.

Mother: We are. We just have a few more days. I know it's hard to be so close. Go find some willow sticks to cook the bacon on.

William: Yes, Mother. (Hesitates) I'm hungry. When is dinner going to be ready? I can't wait to eat something besides bacon and biscuits. It doesn't taste good any more. At least we get beans tonight!

Widow Sarah: I think I smell something. (William looks at the baby and runs off to get the sticks.)

Sue: I'll check the biscuits. (Quickly lifts lid of Dutch oven so coals don't fall on biscuits) They are almost done. I'll get everything ready for dinner. (Looks at baby out of corner of her eyes and looks very busy getting eating utensils set up on top of a barrel. Meanwhile, John grabs a dishcloth and starts pretending to wash it in a nearby water bucket.)

Mother: (Goes to pick baby up and change diaper) Okay, Charles, I'll see what I can do for you.

Widow Sarah: Thank goodness we're near water again so you can wash the diapers.

Mother: Yes, remember when we were in the desert and didn't have much water? I didn't like just drying the diapers, then scraping them, and airing them out. But what choice did we have? At home I would wash diapers every other day. But there were so many days on the trail that we just didn't have the water to spare.

Widow Sarah: I heard that the Indians used dried moss and grasses. That would sure make it easy, at least when there is grass.

Mother: (Putting baby down and stirring dinner) It's hard to believe we're almost done with this traveling. I find myself looking forward to cooking on a stove again. It will seem so easy.

Widow Sarah: I can hardly believe that when we started this journey, I couldn't cook on an open fire. I couldn't even get the kettle to stand up straight and I always had smoke in my eyes and ashes in the food.

Sue: Remember that sandstorm that came on while we were cooking in the desert? You could hardly recognize anyone our faces were so dirty. I thought I was going to die when James walked by and saw me like that! And the food, no one could eat it with all that sand in it. We had to throw it away and make more!

Mother: I remember trying to cook in that terrible hailstorm, the one that seemed to last forever and had those huge hailstones. I couldn't stand being pelted so hard and went into the wagon. By the time I came out the beans were burned.

John: I remember the yummy berries we collected. (Still playing in the water bucket with the rag)

William: (Returning with willow sticks) I remember the fresh buffalo meat. I'd sure like some right now. Hey, what is John doing? (They all look over and gasp.)

Mother: Oh, no! He's washing the dirty, soapy dishrag in our drinking water.

John smiles, scene over.

BOYS GATHERING FIREWOOD

Actors: Matt, David, Milton, Sam, Caleb

Scene: Boys walking through woods collecting wood, stopping to chat.

Matt: This place is pretty nice, huh? I like it here and there's plenty of wood. Pretty too.

David: Yes, I hope where we're going in California will be as nice as this. I like all these big trees!

Milton: There weren't any trees like these in Illinois.

Sam: They look especially good after all that barren desert. I thought we'd never get across.

Caleb: I was afraid that California was going to look like that.

Matt: I thought we were never going to collect wood again.

David: How come?

Milton: I know! You thought we were going to have to cook on buffalo dung forever.

(Boys all laugh)

Sam: It did work to cook the food but I sure didn't like collecting it. I guess I'm glad it was there though since there weren't any trees.

Caleb: I got used to it. I could gather a bushel in a minute.

Matt: Yea, me too. Too bad it took three bushels to make a good cooking fire.

David: I couldn't believe my Mom. She didn't take kindly to having to cook over buffalo and cow dung. It's the only time I ever heard her swear.

Milton: My Mama didn't mind so much. She said they made a good fire.

Sam: I was glad to have the stuff around when we were in mosquito country. Those dung smudge pots sure kept the mosquitoes and gnats back.

Caleb: My Mother would light one of those buffalo chips and put it in our wagon. It smelled bad but we could stand it longer than the bugs!

Matt: Hey, there's a lot of dead branches over there!

David: I hope it's some of that manzanita. That stuff burns nice and hot.

Milton: That would be great, then maybe we won't have to get so much.

Sam: Let's get a good load anyway so we can have a longer fire.

Caleb: Yea, I hear we might have music and stories tonight. Let's go.

Boys all head off, scene over.

WOMEN WASHING

Actors: Agnes, Catherine, Lavinia, Helen, Mary

Scene: Near a stream's edge, flat rocks along the shore, women in various stages of washing. They should be tending to one or more of the following chores--sorting clothes, tending the fire, scrubbing clothes on rocks or washboard, stirring clothes in a washtub with a broom handle, taking them out of tubs of "boiling" water, hanging clothes on bushes or laying them out on grass. Talking while they work.

Agnes: I certainly will be glad to get this job done. Just think, this might be the last time we have to do this on the trail. Next time we might be in civilization.

Lavinia: Well, we still don't know how civilized things will be in California. And we don't know if we'll be there in two weeks. We've heard so many stories that I don't know what to believe anymore.

Catherine: Don't let yourself get discouraged. I believe we truly are almost there. Look on the bright side. Doing the wash in California couldn't be any harder than what we've been doing on the trail.

Helen: That's for sure. I've gotten to really dread this job. I didn't even like it back in Missouri. I thought it took a lot of time then. What I wouldn't give for the good old days.

Mary: At least we have a stream nearby to wash in today. That's an improvement. We don't have to carry the water so far.

Agnes: I never thought I was going to get our clothes clean again. Having to do everything in one pot--heat the water, wash and boil everything, then rinse.

Lavinia: I always prided myself in keeping my family clean and neatly dressed. Sometimes I get so discouraged and frustrated!

Catherine: Now, Lavinia, calm down. I'm sure your whites will sparkle again in your new home.

Helen: At least the water here is not so hard as it was at our last wash stop two weeks ago. That washing took all my strength and a huge amount of my soap. Even then, the clothes did not come out looking clean.

Mary: Just think about how much dirt is in these clothes! What with not doing the laundry but every two weeks, the long, hot, dusty days on the trail, and the endless chores, why, there must be ground dirt in every fiber!

Agnes: You're right. We should feel good about what we are able to do under these conditions.

Lavinia: Well, I still don't like having to work this hard and then having to lay the cleaned clothes on the grass or a bush to dry. The worst is when they don't dry and I have to hang them all over the wagon while we are traveling. They get dirty again before we even wear them.

Catherine: I don't think I would advise anyone who comes west to wear white, or for that matter, anything fancy. Plain, simple cut calico dresses are much more practical. They don't show the dirt as much. Remember that frilly white dress you bought, Helen. It's brown now!

Helen: Yes, I'm going to write my sister, who hopes to come out next year, and tell her to bring pillows and clothing made in dark calico and colored sheets.

Mary: I know one advantage of doing the wash on this trip.

All others: What?

Mary: No ironing!

Laughter, end scene.

SETTING UP CAMP

Actors: George, Jessy, Peter, Henry, Lowell

Scene: George and Peter working on a broken wagon wheel, Jessy and Henry setting up a tent, and Lowell digging a trench around the tents. (Remember, everything is protected in a national park, Lowell just pretends to dig!) They are talking while working.

George: I don't think this old wagon will make it much longer. It's taken a beating.

Jessy: The road in some places is much rougher than we were lead to believe. I'm not so sure all those guides who wrote those books actually traveled the trail, at least not with wagons.

Peter: I think you're right. These trails wouldn't look so bad on horseback.

Henry: Thank goodness the last part of this trail hasn't been so bad. Once we left the desert we've been making good time.

Lowell: Well, from what I hear, this is by far the easiest way to get over the Sierra Nevada range and into California.

George: I talked to one man who was headed back east and he said he had been over the Sierra Nevada in seven places and this was the only one with a natural good pass.

Jessy: I heard that on some of the passes, they actually had to unload the wagons and carry everything to the top, walk the oxen up, then attach the oxen to the wagons by long ropes and chains. The poor men and oxen worked together to pull those wagons up cliffs!

Peter: Sounds like a lot of extra work. I'm glad we found out about this route.

Henry: Darn, looks like we've run out of decent wheel pegs. I'll find a piece of wood and carve another one. (Looks around, finds 9-inch stick about 1-inch thick, pretends to whittle the end to a point)

Lowell: I'll just keep digging this ditch. It looks like it might rain tonight. (Works around the spot where Henry just left)

George: We appreciate your helping us and digging around our tents. Last rain storm I didn't have time to dig a trench around my tent and everything got soaking wet. Even hanging it up in the wagon all day didn't dry it out.

Jessy: We're lucky, the wife and I can sleep on top of the goods in the wagon if we need to. There's been enough rain to make me glad we had that option.

Peter: We sure can't fit in our wagon, just too much stuff. We can only get one of the kids in at a time.

Henry: There, I'm done with one. I'll make a couple more.

Lowell: I'm glad I brought as many tools with me as I did. I know they'll come in handy on my homestead.

George: I'm glad you brought them too. Otherwise I'd have a harder time fixing this here wheel.

Jessy: Looks like the rest of the wagons are completing the circle. We can let the livestock feed outside of the wagons for awhile before letting them into the circle. It sure helped me to sleep easier in Indian country knowing that the livestock was surrounded by our wagons.

Peter: Guess I'll go over and start unharnessing the other horse now that we have this wheel almost finished. (He heads over and starts unsaddling.)

Henry: Tents are up, we're ready for rain. I'm going down to the stream to start bringing water up.

Lowell: Take a little rinse off while you're there. You could use it!

End scene.

HUNTING, SCOUTING

Actors: Joseph (16 years old), Erwin (father), Irene (17 years old), Elizabeth (15 years old), Margaret (13 years old)

Scene: Walking, then stopping, looking around and crouching behind bushes.

Irene: I hope we find a deer. I'd sure like to taste some fresh meat, Father.

Erwin: Me too, honey. You girls keep a sharp look out.

Joseph: I can't believe you taught your girls how to hunt.

Margaret: And why not, Joseph? We can hunt just as well as you can!

Irene: Now Margaret, don't get so uppity. All of our friends back home would think it was unusual too. How many of your friends would even think about going out and hunting?

Margaret: I know. It might mess their frilly dresses up. I'm sure glad we haven't had to wear anything like that for awhile. I like wearing these bloomers and don't want to go back to dresses.

Irene: Bloomers sure are more practical to work in but they don't look very feminine!

Elizabeth: Shh! I heard something. (They stop and listen) It's nothing I guess.

Erwin: There doesn't seem to be much game here.

Joseph: Certainly nothing like there was on the prairies. There weren't as many buffalo as I thought there would be, but there was enough to get by. I sure had heard a lot of stories about vast herds.

Margaret: Father, let's go to the top of that little hill, maybe we can see something from there. (They walk up hill.)

Joseph: Look at that river drainage. Are we going to follow that?

Erwin: We'll mention it to our guide. That might even be the trail. Look out west. That's where our new home will be. Maybe there will be more game there.

Margaret: I hear that there lots of ducks to be had in the winter. Someone told me that when a big flock flies overhead, it will blot the sun out for fifteen minutes.

Elizabeth: Look, deer tracks. (They gather around a "track.")

Irene: I have to admit, I'm glad they're not bear tracks. I want fresh meat but I'm not sure I want to take on a bear. The man we met last night said they have huge bears here in California.

Joseph: Let's follow them. (They follow tracks for a minute.)

Irene: Darn, they go right into this heavy brush.

Erwin: It's getting late. I think we'll have bacon for dinner again tonight. Let's head back.

Margaret: I sure hope we have better luck tomorrow.

(They leave to head back to camp.)

LETTERS HOME

SUMMARY: Students will pretend to be pioneers and write a realistic letter to a friend "back home." Letters will describe the hopes and hardships of their westward journey in the 1850s.

GOAL: To introduce students through personal narratives to life as pioneers traveling west in the 1850s

OBJECTIVES: By the end of the lesson, students (as role-playing pioneer children) will be able to describe in written form (1) why they are making the trip, (2) what they miss and what they look forward to, (3) their favorite things about the trip, and (4) the worst part of the journey.

GRADE LEVEL: Fourth, Fifth, and Seventh

TIME REQUIRED: Two 45 to 60 minute sessions

LOCATION: Classroom

MATERIALS: Overhead projector, several transparent sheets and markers, attached 1850s United States map, and pencil and paper for each student

SUBJECTS: CA History, Economics, Language Arts

KEY WORDS:

Fort - a way-station to rest, make repairs, send and receive mail, and purchase or barter for supplies. These were not Army forts, but commercial establishments.

Wagon - the main mode of transportation for the emigrants which was covered with canvas (painted for waterproofing) and was four by twelve by three feet deep. Wagons were purchased or built at home before departure. Iron straps reinforced stress points and iron rims on the wheels were used as tires.

Scurvy - disease caused by lack of fresh fruits and vegetables in the diet. Usually prevented by eating dried fruits, pickles, or vinegar along the trail. (It was not yet widely known that lack of vitamin C was the cause of scurvy.)

Cookstove - cast iron, box-shaped, wood burning stove carried in the wagons for heat and meal preparation.

Journals, diaries, letters - handwritten personal accounts of the daily lives of the westward migrants. Ink and paper were important items of trade at the forts, as many pioneers kept written records of their journeys.

BACKGROUND: This activity may be done in conjunction with the Emigrant West activity although it is not required.

A family's decision to join the westward migration in the 1850s meant leaving behind everything that was familiar, enduring a rugged, sometimes life-threatening journey, and starting a new life in a new land. Letters were the only link to the friends and family they had left behind.

Journals, diaries, and letters of the emigrants breathe life into the facts of their westward trek, a journey that changed the lands west of the Mississippi forever.

INSTRUCTIONAL SEQUENCE:

Before beginning the activity prepare the following: (1) make overhead transparency of 1850 United States map, (2) prepare paper copies of 1850 map for students, and (3) if desired, duplicate the letter-writing instructions to distribute to students for reference as they work.

Brainstorm with the class some of the reasons families decided to travel west. List on an overhead transparency: (1) open land (640 acres free from government versus \$200 for 160 acres), (2) depression of 1837 and drop in farm prices, (3) less crowded, less competition for jobs, (4) stories of rich soil, mild weather, riches just waiting to be made, (5) sense of adventure, and (6) criminals escaping the Law.

(1) Ask students to measure out the size of a wagon on the classroom floor (four feet wide by twelve feet long with three foot sides, and a canvas roof with pockets sewn inside for extra storage) and to imagine carrying all their supplies in that space. (2) Ask them to brainstorm what tools, foods, and supplies would be needed and to list their ideas on a transparency (duplicate for folders). (3) Add more items to the list such as: shovel, pick ax, saw, wagon repair parts, rope, strong knife, rifle, and ammunition. Lamps, fuel oil, candles, matches, iron cookstove, large kettle, skillet, teapot, butter churn, eating utensils, and water barrels. Clothes, cradle, chest of linens and blankets, medicines, and ground cloths. A bushel of dried fruit and 200 pounds of flour per person, bacon, molasses, vinegar (to fight scurvy), coffee, beans, rice, cornmeal, and jerky.

Project the 1850s map and ask students to locate a few of the main starting points for the travelers. Compare to recent United States map.

Discuss the following: (1) How the migrants got to the starting points (steamboat, paddle-wheeler, train, or spring wagon). (2) How they joined a group and hired a guide for the trip (leaders advertised through meetings and word of mouth, travelers had to consider cost, trustworthiness of the leader, and whether they could get along with other members of the group). (3) How they gathered and paid for the essential equipment and livestock (by selling their farms, homes, livestock, furniture, and businesses).

Ask students to locate the first forts the travelers might reach on the map. Use the map key to estimate distance and how many days it took to reach the first fort. (If the migrants had to cross a river or push the wagons up steep mountains, parties could travel only a few miles

a day. Across the plains, where water and feed for the livestock were scarce, the groups pushed ahead as fast as possible, covering as much as twenty miles in a day.)

Relate how the travelers relished their layover at a fort. They could hear news, bathe and do laundry, replenish food supplies, repair wagons, get medical help, rest their oxen, and send and receive letters.

Read aloud this list of items they could barter for or purchase at a fort from 1852 journals and letters: a new coat traded for 400 pounds of flour, a satin evening dress traded for a pair of used trail boots, a beaded purse for a cow, suspenders for 75 cents, meat for a week for two dollars, and baby shoes for one dollar.

To begin the letter-writing activity, read the following to the class: You are a child traveling west with your family. When you started the trip, you left behind your home, your school, and your friends. Now you are "laying over" at a fort for a few days. Write a letter to your best friend. Describe what your days are like, your chores, what you eat, and where you sleep at night. Tell your friend why your family wanted to make the journey. Include your feelings about the trip, what you're looking forward to, what you miss, and what frightens you. Include whether you believe the trip is worthwhile and if your friend's family should attempt it, too.

If desired, distribute copies of the instructions for student reference.

Allow time for student writing.

EXTENSION/ENRICHMENT: Art/Crafts - Stitch together a class quilt from scraps. Use it as a wall hanging or in a reading area. Make willow whistles and corn husk dolls, favorite toys of pioneer children. Recreation - Play a few of the games enjoyed by pioneer children, such as "Drop the Handkerchief," "Pointer's Bluff," or "Hunt the Ring."

ASSESSMENT: Use the student letters for assessment. Have the students share their letters in class. Discuss and evaluate the content of the letters in relation to the lesson objectives.

SETTLERS IN A NEW LAND

SUMMARY: Students work together in groups and role play pioneer emigrants establishing their new found homes out west in the 1850s.

GOAL: To introduce students to pioneer emigrant life in their new western homeland

OBJECTIVES: Students will plan and describe the following pioneer situations.

(1) Selecting and establishing a home site, (2) how they will make a living in their new found home, (3) rules needed for the establishment of a community, and (4) how they will preserve and protect the natural resources

GRADE LEVEL: Fourth, Fifth and Seventh

TIME REQUIRED: 45 to 90 minutes depending on group

LOCATION: Various sites at Lassen Volcanic National Park

MATERIALS: Large writing paper, felt pens, easel to support pad, large heavy paper or cardboard, and dark felt pens or charcoal. Each group will need scratch paper, pencils, and a clipboard.

SUBJECTS: CA History, Social Science, Economics

KEY WORDS:

Natural Resources - often used for the benefit of people. All the naturally growing plants, wild game and other animal life, air, water, land, and minerals.

Community - group of people living and working in close proximity. Jobs and roles are usually interdependent with other community members.

Barter - an exchange of items or labor, instead of using money which was scarce in the early days of the country.

BACKGROUND: Between 1847 and 1849 some 8,000 emigrants were persuaded to follow Lassen's Trail to cross into California. They were discouraged by the wandering, rugged miles and Lassen's tendency to get lost. Rescue parties were their only salvation. Peter Lassen's dubious reputation as a trail blazer spread and the trail was seldom used after that.

Nobles' Trail, established in 1851, was easier and far more direct. The trail passed Cinder Cone, crossed Deer Creek, and then followed Lost Creek to pass by Manzanita Lake. Ruts from wagon wheels can still be seen near Cinder Cone.

Footsore and weary, emigrants on the Nobles' Trail were overwhelmed with the natural beauty surrounding them. The clear streams, lush forests, and plentiful game were all they had "heard tell about" and then some.

INSTRUCTIONAL SEQUENCE: This activity can be done at a number of locations in the park. Suggested locations include the Lily Pond trail, near the Loomis Museum, or the Manzanita Lake Picnic Area. Whatever site is selected, it is important to visit the site before bringing your class to the park. This will provide for better organization and success of the activity.

1. In class introduce the activity and explain to the students that they are part of a pioneer emigrant party who has finally made it to California and is about to establish a new settlement. There are a number of families settling here. Divide the students up into "family groups" of four or five students depending on the size of the class. Explain that they will be working as a family during this activity.

2. Make a list on the blackboard of the following things each group will need to plan in building their new life out west. Discuss the list with the class and have the students copy the list to use on the field trip.

Have them think about these things in class or at home before going on the field trip: (a) location of home site, (b) description of new home--inside and out, (c) what will the house be built of and how will they obtain building materials, (d) how will they get water, fuel for lamps and cooking, and food--grow, barter, buy, (e) how will they dispose of wastes, and (f) how will the livestock be cared for and be used.

3. Collect all the materials needed for the activity.

4. Bring the class to the park. Take some time when you arrive to explore the Loomis Museum if it is open.

5. Gather the class together in preparation for the activity at the site selected.

6. Set up the easel and pad.

7. Tell the students that as newly arrived pioneers, they have chosen to settle in this area. Ask them to brainstorm what factors make it a suitable location. List their ideas on the pad. (Suggestions: (a) near a river, a road, a town with supplies, (b) good soil, fresh water, shade, game, fish, lumber, and (c) deer skin, beaver fur, water for irrigation.)

8. Have the class divide into their family groups for the activity.

9. Explain that the family groups will each go out and find a home site in the area you have selected to use. Establish boundaries and make sure everyone is clear about their location. Make sure each group has a copy of the "planning list" they prepared in class. These are some things they need to think about and discuss as a family group in planning for their new life out west.

10. Remind students that they have a few items in their wagons to use. Ask them to brainstorm what those items might be and list on the pad.

11. Make sure each group has paper, pencils, and a clipboard.
12. Remind students of the park rules. Dismiss the groups and instruct them to meet back with you in fifteen minutes with their ideas.
13. While they are looking for their homesites and discussing their plans for their future, sketch a rough map of the area on the sheet of cardboard. Use dark felt pen or charcoal to look more authentic. Prop up your map on the easel.
14. As each group returns, ask them to draw their "homesite" on the map.
15. Ask groups to give a two to three minute presentation about what they have decided. Does everyone approve of all the homesites, or will there be problems? Ask the "community" to suggest improvements. Revise the map if needed.

NOTE: If you are running short of time, you may wish to finish the rest of the activity back in class.

16. Family groups will need a source of income. Ask students to brainstorm some ways a family can make a living in the new settlement. List on the pad. (Suggestions: provide a service, work in the saw mill at the next town, sell supplies to miners, be a laborer at valley farms, teach children in the settlement, provide medical help, carry mail.)
17. Ask each family group how they have decided to make a living. Call on one group at a time to write their occupation next to their "home" on the map.
18. Discuss the choices and whether or not the community could be self-sufficient.
19. Ask the class to plan how issues affecting the community will be decided? What rules are needed? Who will be in charge of enforcing the rules and deciding on punishment? Make notes on the large pad.
20. Read the following aloud, then discuss: "The cities you left behind were crowded, with few trees and overused streams. You have spent months traveling across parched deserts and rough mountains to reach this new land. You have chosen to settle in this area because of the natural beauty of the forest, the abundance of wildlife, and the clean water. How will you ensure that these resources are preserved and protected for your children and grandchildren?" Make notes on the large pad.
21. Ask each group to meet again. Working together, they will write a description of everything they have planned for their new homes, jobs, the health and welfare of their community, and how they will preserve and protect the natural resources. Allow ten to fifteen minutes; longer if needed.

EXTENSION/ENRICHMENT: History - Research the lives of Peter Lassen and William Nobles. Draw maps of the trails they developed. Compare the pros and cons of each trail. Develop a sense of the times by researching what events were occurring in the rest of the country during the 1850s. Language Arts -Print a newspaper for the new arrivals. Include articles on government, wars, economy, new states and boundaries changes, local announcements, society and fashion news, land and building materials advertisements, and a menu (with prices) from a new cafe. Cooking - Prepare a pot of vegetables and some biscuits in a Dutch Oven over a campfire.

ASSESSMENT: "Family group" and individual work from this activity provides the basis for assessment. The class can participate in self assessment by having each family group present their work to the class. The students will critique each group on the basis of how well they accomplished the objectives and planning list in No. 2 of the Instructional Sequence.

LASSEN VOLCANIC OFFICIAL MAP AND GUIDE

SUMMARY: Students will use a map with descriptive text to learn about Lassen Volcanic National Park. They will plan a visit based on specific details they learn from the map.

GOAL: To provide students with an introduction to Lassen Volcanic National Park.

OBJECTIVES: Students will use the park map to: (1) Develop an itinerary for a visit to the park, (2) List at least five interesting facts about the park, (3) Identify and describe at least three specific features found in Lassen Volcanic National Park.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: Two 45 to 60-minute periods

LOCATION: Classroom

MATERIALS: Copies of the “Lassen Volcanic National Park Official Map and Guide.” Maps can be requested from the park or downloaded from our official website. It is suggested that you have a copy of the map for each group of four or five students. Laminate the maps and reuse them. Paper for individual and/or group drawings and notes is also needed.

SUBJECTS: History, Science, Language Arts, Mathematics

KEY WORDS: Cultural History, Natural History, National Park Service, Landscape

BACKGROUND: The “map and guide” provides a concise introduction to the Park. Use of the guide encourages students to read and study maps and/or pictures, and builds their interest in Lassen Volcanic National Park.

INSTRUCTIONAL SEQUENCE: Form groups of four or five. Using the “map and guide” have the groups read, discuss, and complete the Student Activity Page. After completion of the Activity Page, go over the answers in a group discussion.

EXTENSION/ENRICHMENT: (1) Pretend you are a tour guide trying to convince a group to take a tour of the Park. Write and present a sales pitch to your group or the class. You may want to use a model or picture of the Park when you give your speech. (2) Write a list and/or make a drawing of your ideas to improve the “map and guide” and send them to the Park Superintendent. Note: If your class has several plans or ideas, send them all in one package. (3) Design questions to ask park personnel when you visit or make a checklist of items you would like to draw and/or describe in your journals.

ASSESSMENT: Student work and presentations provide samples for assessment and inclusion in student portfolios. Each group could present completed Student Activity Pages to the class and these pages could be compared to quality criteria agreed upon by the class and teacher before and during the activity. The plan for the visit or suggestions for improving the “map and guide” also make good products for assessment. Engage the class in a discussion before beginning the actual work and define the parameters of a quality project.

Student Activity Page

1. Using the Official Map and Guide answer the following questions.
 - a. What are the names of the three largest lakes in the Park?
 - b. How many mountains in the Park are over 8,000 feet in elevation?
 - c. How many ranger stations are there in the Park?
 - d. What campgrounds are not next to a lake?
 - e. How many lakes does the Pacific Crest Trail go by?
 - f. What is the name of the highest mountain in the Park?
 - g. There are three unpaved roads into the Park. Where do they go to?
2. Being a national park, regulations, safety, and warnings about thermal areas are important. List three important rules you should follow while visiting Lassen Volcanic National Park.
3. Plan a visit to the Park with your group. Write down five places you would like to visit, explain what you plan to do at each one, and what route you will take to get to each one.
4. List the names of four famous people that were part of the history of the Lassen area.
5. Lassen Volcanic National Park has been set aside to preserve a place having natural, cultural, recreational, and historical features that make it worthy of saving for future generations. What are the features that make this Park a special place?
6. List five interesting facts you have learned about the Park and its volcanic history.
7. If you were redesigning the “Lassen Volcanic National Park Official Map and Guide,” how would you make it even better?

Note and Observations

IT'S A GREAT IDEA

SUMMARY: Students will be introduced to the history of the National Park System and develop a management plan for a new national park.

GOAL: To provide students with an introduction about how a national park is established and developed.

OBJECTIVES: Students will (1) describe in writing how the National Park System was established (2) Develop a management plan for a new National Park.

GRADE LEVEL: Sixth through twelfth

TIME REQUIRED: Minimum of three 45 to 60-minute periods

LOCATION: Classroom

MATERIALS: Two-page Historical Brief - one per student. Student Activity Page - one per group. Map of Volcano National Park - one per group.

SUBJECTS: History/Social Science, Language Arts, Visual and Performing Arts

KEY WORDS: Natural and Cultural Resources, Conservation, Preservation, National Park, Development

BACKGROUND: The history of the National Park System is a fascinating study of how our political system works. The creation of national parks in the United States is a true extension of the ideals of democracy at work, the government being the agent for all people to live in a way conducive to promoting life, liberty, and the pursuit of happiness. This is an excellent introduction for students to the implementation of the ideals expressed in the Declaration of Independence and the Constitution.

Before the idea of national parks came to be, wilderness areas were viewed as places to be tamed and used for profit. The first person to propose a national park was artist George Catlin, who is best known for his paintings of American Indians. Other well known people of the 1800s, mostly authors and artists, gave romantic portrayals of America's wilderness that supported establishment of national parks. Included among these people are James Fenimore Cooper, Henry David Thoreau, Thomas Cole, and John Muir.

A two-page Historical Brief based on the book, The National Parks: Shaping the System (Mackintosh, Barry, 1991, Library of Congress), is provided. It has information about the background and philosophy that have led to the development of the National Park Service. The questions that accompany this activity are complex and require that students have time for individual reflection, group discussion, whole class discussion, research, and summation of their

own thoughts after working on answers. This is a purposeful departure from simple content questions and answers toward a thinking, meaning-centered curriculum. The teacher's role is to pose complex questions, to provide time and a variety of grouping strategies for working on answers, to facilitate the search for additional information and resources (using libraries, people, and computer networks as appropriate and available), and to model life-long learning as he/she becomes a partner with students to learn as much as possible about one of our greatest treasures, our National Park System.

INSTRUCTIONAL SEQUENCE: This activity is best done in three 45-minute segments: (1) Reading, discussing, and answering the questions pertaining to the historical brief; (2) student development of a park management plan for Volcano National Park; and (3) management plan presentations by students.

Divide the class into groups of three to four students. Make sure that groups are heterogeneously grouped according to reading ability. If reading is problematic, one student per group could be the reader or the teacher could read the selection to the class. All students should have a copy of the written materials in hand so they can follow along and refer to materials when they are answering questions and doing activities. Begin by reading or having students read the Historical Brief. Discuss the information with the students. Students in small groups should read and discuss the questions. Each student will write his/her own answers. After the students have answered the questions, discuss their answers as a class. Next, each group will read the Student Activity Page. Using this information, each group will work together and write their plan for the new park.

EXTENSION/ENRICHMENT: (1) Research the artists or writers of the 1800s who influenced the way people thought about America's wilderness and parks, thus promoting the establishment of the National Park System. Learn more about this person and be prepared to share it with the class. (2) Many different lands fall under the jurisdiction of the National Park Service including national parks, national historic sites, national recreation areas, and national monuments. Choose one of these types of Park Service units and learn more about it. Be prepared to share what you learn with the class.

ASSESSMENT: Student work and presentations provide samples for assessment. For instance, when students give their presentation of their park management plan, does the plan show evidence of understanding the need to preserve and protect park resources while allowing visitor access? Does the plan reflect the mission and goals of the National Park Service? Written, visual, and oral presentations are all parts of a quality product and should be considered in the assessment process.

Historical Brief

The idea of preserving places in America as national parks was first discussed by artists, writers, and visionary citizens who wanted to see special places saved for all time and for all people to enjoy. John Muir was one of these people. He studied and traveled in wild places all over the United States and wrote about his experiences. His writings about a beautiful valley in California's Sierra Nevada mountains with sheer granite rock faces reaching heights of 4,000 feet, cascading waterfalls, and numerous meadows, flowers, and huge trees, introduced Yosemite to the world. In 1864 Congress designated Yosemite Valley and the nearby Mariposa grove of giant sequoia trees as a state preserve "upon the express conditions that the premises shall be held for public use, resort and recreation, shall be held inalienable for all time."

Between 1869 and 1871 trappers and explorers told amazing stories about an area called Yellowstone. Great geysers shot hot water out of the ground. Mudpots and hot springs gurgled and steamed. Elk, grizzly bears, wolves, and other wildlife were abundant on the rich land bounded by beautiful mountains. Some of the people who visited Yellowstone and saw its geologic wonders suggested that the area be preserved for public use. After much debate, Congress passed the Yellowstone Bill and on March 1, 1872 President Grant signed the bill making Yellowstone the first national park. It was "dedicated and set apart as a public park for the benefit and enjoyment of the people." At that time no money was set aside to take care of it. It was a park without caretakers. In 1886 the United States Cavalry began a 30-year span of army control of Yellowstone in an effort to protect it. As the troops rode into the Park, they passed wagonloads of logs being carted out. They encountered hunters camped by the rivers and saw tourists bringing out mineral specimens they knocked off geyser and hot spring formations. With no one to take care of the Park, it would not survive in its natural state. So, these early years depended on the military to protect our first national park.

National parks are established by acts (laws) of Congress. In the next 40 years, the national park idea sprang to life in America. With the establishment of Yellowstone as a national park, Congress and the American people felt a desire to protect more of America's "special places" as national parks. In 1890 Yosemite and Sequoia became national parks. Throughout the west many other beautiful places were made national parks by Congress. Mount Rainier, Crater Lake, Rocky Mountain, and Glacier National Parks were established. By 1916 the United States government oversaw 14 national parks, 21 national monuments, and two historic reservations. Management of these public areas was difficult because there was no single agency to take care of these national treasures.

It became clear that the national parks needed a single organization to administer and protect them. On August 25, 1916 legislation was signed that created the National Park Service "to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." This new agency obtained its first money from Congress and prepared its first park policies to provide a purpose and methods for managing the national parks in order to meet its dual mission of preserving the parks in their natural state and providing for their enjoyment by the public. These national treasures were now more than just a collection of parks; they were now part of the National Park System managed by the National Park Service

The National Park Service was immediately faced with the challenge of wise park management and stewardship. This meant decisions had to be carefully made about where to build roads, trails, visitor centers, campgrounds, and other visitor service facilities. It was not an easy task to protect the parks and at the same time provide for public use and enjoyment.

Through the 1920s most national parks were in the western states where large areas of public land remained. If the National Park Service was to benefit more people, it would have to expand eastward where most of the population lived. Since most land in the east was privately owned, this provided new challenges. Congress said that parks in the east could be established but the land must be donated. John D. Rockefeller, Jr. was instrumental in providing funds for the purchase of lands in areas which are now the Great Smoky Mountains, Acadia, and Shenandoah National Parks. During the next decade, the National Park Service began to acquire and manage national historic parks in the east including Lincoln Memorial, Thomas Jefferson Memorial, and Gettysburg National Military Park. This expanded the view of parks, allowing cultural and historical places worthy of protection to be added which created a better-rounded National Park System.

The number and types of units in the National Park System has continued to grow, as well as the kinds of units. Currently there are over 390 units in the system. When new units are established, careful planning has to be made to balance development for people and preservation of the natural and cultural resources. Good management requires well thought out decisions.

Questions

1. In the late 1800s, the United States government had a terrible time managing the national parks. Why?
2. What are some of the things that happened that helped protect our parks and create a National Park System?
3. When Congress established the National Park Service in 1916, the purpose was “to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.” What does this mean?
4. Why do you think the National Park System is among America’s proudest and best loved places?

Student Activity Page

The first policies of the National Park System required that the parks be preserved in their natural state or for cultural/historical purposes and that enjoyment of the parks by the public be provided. This vision still guides the work of the National Park Service. Pretend that Volcano National Park has just been established. It is in the mountains (at elevations of 6,000 to 10,000 feet) with many beautiful lakes and streams. It is a land of volcanoes and has areas where hot springs bubble to the surface. It has a pioneer emigrant trail, historic settler buildings, and American Indian village sites. This new national park has no roads or visitor facilities and is within a two- hour drive of a major city. Your group has been given the task of deciding on the development and management of the Park. Your group must decide how to protect park resources (both natural and cultural) and still allow for visitor use. The decisions you make will be the Volcano National Park Management Plan. Include and justify any development that will be built. Explain how these activities will allow for enjoyment of the park's special features while preserving and protecting the Park for future generations. Be prepared to present your plan to the class.

Using the park map, decide where the road through the Park should go. Once you decide where to put the road, draw it on the map with a pencil. If you are sure of your decision about the road, trace your route with an ink pen.

You need to next decide which of the following development options are necessary and needed in the Park. Some of these may not be needed inside the Park and may be better placed outside of it. Remember to not disturb or place developments too close to natural or cultural sites such as Indian or pioneer sites, lakes, creeks, thermal areas, or volcanoes.

The park development options are numbered. Mark the number of each option your group selects in the place you want it to be on the map. Your choices are your plan for the Park. You may choose some of the development options more than once if your group thinks that they are needed in more than one location. Be ready to explain to the rest of the class why you made the decisions you did.

Park Development Options

1. Hotel
2. Campground
3. Picnic area
4. Gas station
5. Visitor center
6. Ranger station
7. Museum
8. Gift shop
9. Camper store
10. Nature trail
11. Bank
12. Restaurant
13. National park office

Things to consider when developing your park plan:

1. Areas off limits to people
2. Safety of visitors
3. Protection of wildlife habitat
4. Protection of lakes and streams
5. Protection of cultural and historical sites

Notes and Observations

THE AMERICAN WAY

SUMMARY: Students will participate in a “town meeting” where they portray various individuals who were involved in the establishment and early development of Lassen Volcanic National Park.

GOAL: For students to develop an understanding of how the process of public debate and free speech contribute to the establishment of a national park.

OBJECTIVES: Students will be able to (1) name at least two individuals who were instrumental in establishing and developing Lassen Volcanic National Park, (2) describe two reasons why the Park was established, and (3) compare their personal and modern views about land use with historical viewpoints.

GRADE LEVEL: Fifth through twelfth

TIME REQUIRED: One or two 45-minute periods

LOCATION: Classroom

MATERIALS: Character Cards, pencils, paper

SUBJECTS: History, Social Science, Language Art, Drama

KEY WORDS: Establish, Develop, Conservation, Preservation, Debate

BACKGROUND: On May 6, 1907 President Theodore R. Roosevelt established Cinder Cone and Lassen Peak National Monuments. Many people had worked hard for this goal, and yet the work was just beginning. Since then, more land was acquired, Lassen Peak erupted, and our country’s 13th national park, Lassen Volcanic, was established on August 9, 1916. As with the establishment of any national park, people had to be convinced of the area’s value.

In this activity, students will portray historical individuals who had an interest in the Lassen area. Although some of these people lived at different times, they all had an effect on the final decision. A brief character description and other pertinent information is found on each Character Card. If time permits, students could research their characters more thoroughly.

This is not a formal debate, but a “town meeting” where each viewpoint is shared. This activity is great fun if each student tries to impersonate his/her character. Give them a few minutes to think about the voice that they might want to use. You might want to make some props available. Each student’s character should state and explain his/her viewpoint. The committee members will make the final decision. The teacher or one of the students can act as judge.

There seemed to be more people for rather than against the formation of Lassen Volcanic National Park. Small groups of people were against it but they were not well organized or represented.

Interesting, detailed, historical information can be found in: Footprints in Time, A History of Lassen Volcanic National Park by Douglas H. Strong, “History Notes” in the reference section or park’s teacher packet, and Eruptions of Lassen Peak by B. F. Loomis which is both interesting and educational and includes personal accounts of the eruptions as well as the remarkable photographs taken by its author.

INSTRUCTIONAL SEQUENCE:

1. Explain that there will be a meeting to discuss the fate of the land and features surrounding Lassen Peak. Some students will receive Character Cards and portray their character’s viewpoints and concerns. Other students will be on the “National Park Committee” and will listen to all the concerns. They then must decide whether to establish a new park called Lassen Volcanic National Park, keep the two small monuments as they are, or have the area revert back to national forest.
2. Pass out the Character Cards. Have the students read the information and decide how they want to portray their character. Remind students that they are representing their character’s viewpoint, not their own.
3. Have the rest of the class, the “National Park Committee,” set up the “meeting hall.” Chairs for the committee should be in a semicircle on one side of the front of the room. Set a podium in front of the committee. Place enough chairs for the waiting characters facing the front.
4. Call the meeting to order. As each character is introduced, he/she comes to the podium and shares concerns and viewpoints. Characters get about two minutes each and should state their name, time they lived in the area, their connection with the area, what their job is, why they think a park should or should not be established, and/or what alternative they support. Remind the students that they will be trying to convince the committee to vote for the alternative of their characters’ choices.
5. After all the views have been represented, the committee should openly discuss all the alternatives and then vote. The alternatives can include, but are not limited to: full national park designation, keep status the same as separate national monuments, or revert back to national forest.
6. After the committee votes, open the discussion up to the whole class. Would any have voted differently? Why or why not?
7. Have each student pick one of the characters and write a paragraph on how that person might have felt about establishing Lassen Volcanic National Park.

EXTENSION/ENRICHMENT:

1. If Lassen Volcanic National Park had not been established in 1916, do you think we would establish it as a national park today? Brainstorm who the interested parties might be. Hold another meeting. Who would be for establishing a park? Who would be against? Why/why not? Who would be at the meeting? Who would be responsible for the final decision? How would you vote? How would your parents? Why?

2. Pick a current local issue such as making Mt. Shasta a national park. Decide which interests should be represented. Hold a meeting. Debate and decide the issue's fate.
3. Read some of the personal experiences in Eruptions of Lassen Peak by B.F. Loomis.
4. Research the characters more thoroughly.

ASSESSMENT: Have the students name three people important in the establishment and early development of Lassen Volcanic National Park, list two reasons why the Park was established, and determine how they would have voted at the meeting if they were alive when Lassen Volcanic National Park was being established. Explain why.

Character Cards

Photocopy for student use.

1. **Louis A Barrett, supervisor of Lassen National Forest from 1905 to 1910.** During this time, Barrett estimated that he walked about 3,500 miles and rode 10,000 miles in the Lassen area. He put into practice the doctrine of multiple use but later reflected that this had helped destroy much of the area's original beauty. He filed a report to the government recommending several points of interest be given national monument status which would protect them from placer and other mining, mineral claims, logging interests, and ranching. Louis Barrett favored national monument over national park status because the "natural curiosities" were small and scattered and the land in between could be used for other purposes. The U.S. Forest Service would retain control instead of handing it over to the Department of Interior.
2. **The ghost of Ishi, representative of the Yahi and Yana tribes who lived in the foothills west of Lassen Peak.** During the hot summers, the Yahi and Yana Native American tribes lived in temporary camps on the cooler slopes of Lassen. Life was not easy even before the settlers came. Their staple food was acorns, supplemented by wild game, roots, berries, seeds, and leafy plants. Their numbers dropped drastically with the coming of settlers due to malaria and other diseases. Settlers moved onto their land and wanted them off of it. Many Indians were hunted down and killed. Some survivors were moved to reservations only to die. Most, if not all, of the Yahi were exterminated by the late 1860s. By 1911 the sole survivor of the Yahi, Ishi, was starving and came out to the town of Oroville. Ishi had been hunted by settlers and had watched all of his family and friends die. Ishi shared some of his culture with us before dying of tuberculosis in 1916. He would probably be glad that "Waganupa" (Lassen Peak) is preserved and held in some respect.
3. **William H. Nobles, artisan and prospector.** He discovered what was probably the easiest trail into California. Nobles sought fame and fortune with his trail but it was not realized during his lifetime. Most emigrants continued to use the more publicized routes farther south. He hoped the trans-continental railroad would go via his route but instead it went over Donner Pass. Part of his trail is preserved in the present day Lassen Volcanic National Park. William Nobles probably would have been pleased to see a national park made that helped commemorate the trail he found.

4. **Joseph Silas Diller, veteran geologist of the U.S. Geological Survey.** He researched the Lassen area for 40 years between 1883 and 1923. Diller realized that Lassen was actually part of the Cascade Range rather than the Sierra Nevada and valued the beauty of this unique geological area. He was instrumental in mapping this area and added greatly to the geological knowledge of the Lassen region. He visited Lassen after eruptions and hiked up Lassen Peak and peered into the smoking new crater. He also viewed the Devastated Area. Diller's Geologic Atlas was often cited to support the park proposal. Joseph Diller supported Dittmar's proposal to establish a park.

5. **Helen Tanner Brodt, first Caucasian woman known to climb to the top of Lassen Peak.** She ascended the peak on August 28, 1864 with her husband, Aurelius Brodt and Major P.B. Reading. They found a crater near the top "sending up vast clouds of sulfurous steam, and making a deafening roar, similar to an immense steam-engine blowing off steam." The newspaper reported that "they had made the trip to Lassen for the purpose of sketching that beautiful mountain." They also found a beautiful small lake, which Mr. Reading named after Helen. She enjoyed the beauty, solitude, and geological wonders of the area.

6. **Major P.B. Reading, rancher, founding father of Shasta County.** He filed a mining claim on what is now Bumpass Hell in 1854 and did other prospecting in the nearby foothills. Reading surveyed Nobles Pass for a possible railroad route, which ended up going through Donner Pass instead. Not much mining was done within the present day park boundaries except at the Sulphur Works, as no large paying deposits of anything were found. Major Reading became the first settler in Shasta County and was a respected citizen. He made many trips to the Lassen area to hike and enjoy its beauty.

7. **Ponderosa Pine Tree.** This tree lived in Lassen for 300 years and has witnessed the coming of settlers. It would like its youngsters to live to a ripe old age and become snags, homes for woodpeckers and other animals to take refuge in. It witnessed logging outside the park boundaries and the accompanying change of scenery and degradation of the environment. This tree was glad that not much logging was done in Lassen due to its general inaccessibility and poor quality of timber. It witnessed the eruptions and watched close friends being blown down in the Devastated Area. This pine tree would like to keep the forest in Lassen intact for the benefit of all wildlife and especially likes small children to walk underneath and look up with admiration.

8. **Mr. Jessen, stockman.** Most of the land now included in the park boundaries was unsuitable for year-round habitation and would not sustain a family. It was good for summer pasture for a few head of cattle. Only about 15 stockmen with 30 to 200 head apiece summered in the area. Jessen's place was destroyed in 1915 by the eruptions and was part of the Devastated Area. When B.F. Loomis saw the Jessen place after the eruption, he said, "The Jessen place was once a fertile meadow, but now it is a waste of land, with not a vestige of buildings or fences to show where the place used to be." Jessen figures the area is a total loss for grazing because of the volcanic activity, but that the land is valuable in other ways.

9. **Benjamin F. Loomis, lumberman, hotel operator, amateur naturalist, and photographer.** He was a long time area resident best known for his incredible photographs of the 1914 to 1917 eruptions of Lassen Peak. Loomis spent lots of time hiking and photographing the Lassen area and wrote numerous newspaper articles about the eruptions, which brought national attention to Lassen. He wrote Eruptions of Lassen Peak and built a stone museum at Manzanita Lake in memory of his only daughter, Mae, who died of influenza. The museum and 40 acres of land were later donated to the National Park Service and included in the Park. B.F. Loomis strongly supported establishment of the Park.

10. **Arthur L. Conard, progressive businessman.** He was an organizer and president of the Lassen Park Development Association. Conard exerted strong leadership in the establishment of Lassen Volcanic National Park and owned 40 acres near Mineral where he spent relaxing summers. He strongly believed that the area was unique and significant as well as beautiful. After the Park was established on August 9, 1916, Arthur Conard promoted interest in the new park by citing its great recreational potential.

11. **Congressman John E. Raker, Representative of the State of California from Susanville for 15 years.** Raker spent part of his childhood near Lassen and vacationed in Drakesbad. He introduced several bills to establish Lassen as a national park. When Lassen Peak erupted, much positive support was generated; his bill was finally successful and was approved by President Wilson in 1916. Congressman Raker continued to be the Park's main spokesperson in Congress until his death in 1926.

12. **Michael E. Dittmar, journalist who started the Redding Record Searchlight, among other papers.** He was interested in Lassen before the eruptions and saw the eruptions as a good way to get support for the Park. Dittmar lobbied on behalf of Redding and Shasta County for the establishment of a national park. He wrote many good descriptions of the scenic beauty of the area and sent in many photos of the eruptions. Michael Dittmar worked on ways to promote interest in the new national park by giving illustrated lectures and worked on the idea of a loop road connecting points of scenic beauty and scientific significance.
13. **Ima Stockman, imaginary stockman.** He grazed cattle in the park boundaries in 1919. Stockman wanted to abolish the Park because grazing brought more revenue than the tourist trade. He thought more people visited the surrounding national forest than the Park and had strong opinions but was outnumbered by people who supported the Park. Ima Stockman wanted the area to be national forest so grazing could be continued.
14. **Milton Supan, son of Dr. Mathias Supan who claimed the Sulphur Works as a mine.** He realized the development value of his property with the loop highway going through it and constructed a lunchroom and gas station. He wanted to continue developing his property for tourists and financial gain. Milton Supan supported the Park but wanted to continue to own his private property within it.
15. **Lance Graham, park visitor.** Graham was born and raised within sight of Lassen Peak. On June 14, 1914 he and two others climbed the peak to look at the newly formed crater. They were at the rim when the eruption began. They ran down as fast as they could but Graham was hit by a flying rock and left for dead. Luckily the rocks and ashes were cool. If they had been hot, all would have been killed. Lance Graham was found alive, and rescued after the eruption was over. He was filled with awe and respect for Lassen Peak!
16. **Atsugewi Tribal Leader.** The Atsugewi (Aht-zsu-GAY-wee) is an Indian tribe that lives northeast of Lassen Peak along Hat Creek and in Hat Creek Valley. The tribe had traditionally used the northwestern portion of the proposed park during summer months for hunting, fishing, and gathering of various plants. For thousands of years this land had provided the tribe with all it needed to survive. The lakes, streams, meadows, and forests had many good memories and important meaning to the tribe. If making this area a national park would result in the land being protected, preserved, and respected by those who would use it, then the Atsugewis would favor making this beautiful place a national park.

K-7

17. **Canada Goose, a regular summer visitor to Manzanita Lake.** He enjoys the quiet, unpolluted lakes in the area surrounding Lassen Peak. This goose builds nests on the shore of many of the lakes and raises his family there. Making Lassen a national park would mean protection from hunting for all the wildlife living in the Park.

18. **Forrest Cutterburg, imaginary prospective lumberman.** He thinks there might be some valuable timber in the Lassen area. Forrest Cutterburg thinks that only the peak and Cinder Cone should be managed as national monuments and the rest as national forest. This would allow logging in all other areas not made into a national park.

THIS SPECIAL PLACE

SUMMARY: Students will explore a site, feature, or area in the park and make a list of details that make that site special.

GOAL: For students to develop their ability to notice details that make a national park a special place

OBJECTIVES: Students will (1) be able to generate a list of what makes a specific site in the park special and (2) be able to explain two reasons why the things chosen make the park special.

GRADE LEVEL: Fourth through twelfth

TIME REQUIRED: 45 to 60 minutes

LOCATION: Any site or trail in Lassen Volcanic National Park

MATERIALS: Students will need pencil or pen, paper, and something to write on (clipboard).

SUBJECTS: Science, Language Arts, History/Social Science

KEY WORDS: Outdoor Classroom, National Park, Special

BACKGROUND: Throughout the history of the National Park System people have been inspired by special places that they have felt should be protected as national parks. Lassen Park was established because of its unique volcanic features. Years after it was established, people have continued to discover other attributes that make Lassen a special place worthy of national park status. Each person that visits Lassen remembers something special about it. This activity provides students with the opportunity to draw on their own discoveries and experiences and to share why they feel Lassen is a special place. This activity complements any subject matter or curriculum planned for the field trip. It provides focus and opportunities for emphasizing the purpose and meaning of the visit.

INSTRUCTIONAL SEQUENCE: Discuss the activity in class before you visit. Be sure students clearly understand the task, materials needed (questions, pencil, something to write answers on, and a place to keep all these things), and what is expected as far as quality of work.

Be sure groups/individuals can spread out enough so they have space/quiet for completing this task. Decide on space boundaries and time limits and have students write them at the top of their papers before they begin so it will be clear that everyone knows the parameters. Then explain that you want the students to make a list of things at the site that they think are special (plants, animals, mountains, streams, sounds, colors, etc.). They need to also explain why they think each item is special. They need to be specific in their answers. Back in class, have the students share and compare their lists. As a class discuss and make a list of things that make Lassen a special place.

EXTENSION/ENRICHMENT: (1) Formulate questions about the site for further discussion or

research with your class. (2) Have the students write a story using their list from the field trip. (3) Have the students make a list of what is special at school, home, or community. Compare this list to the list they made at Lassen Park. (4) Have the students pretend that the site is going to be their classroom for a full school year. From their list, have them write questions about things they do not completely understand or want to study more. (5) Considering all the subjects studied in school (such as math, PE, science, history, etc.), which ones could Lassen Park provide as a well-rounded outdoor classroom? Using the questions from their lists, ask the students to list the subjects that could be incorporated into each question.

ASSESSMENT: Student notes and lists from this activity provide samples for assessment and inclusion in portfolios. A thorough assessment could be provided by having the students write a story about the site using their notes from their on-site visit; it could be titled "This Special Place" or whatever they choose. Another effective way to incorporate this activity into the assessment process is to have the whole class make a list of what they saw, experienced, and learned. Then each student should use this brainstorm list to make a final entry in his/her journal summarizing the trip. Some of the ideas in the enrichment section above may also prove to be effective assessment tools.

A PLACE FOR ALL SEASONS

SUMMARY: Students will record their observations of seasonal changes in the park and discuss why Lassen Volcanic National Park is important.

GOAL: To develop student awareness and understanding of the importance of a national park as a place for all seasons.

OBJECTIVES: Students will 1. Be able to name at least two reasons why Lassen Volcanic National Park is important in all seasons. 2. Be able to share at least two observations of changes in seasons they have noticed.

GRADE LEVEL: Third through Twelve.

TIME REQUIRED: 45-60 minutes in the park and 45 minutes in the classroom.

LOCATION: Any site or trail in Lassen Volcanic National Park

MATERIALS NEEDED: The student will need a copy of the Student Activity Page, pencil or pen, something hard to write on, and lined paper.

SUBJECTS COVERED: Science, Language Arts

KEY WORDS: National Park, environment, habitat

RELATED CONCEPTS: •Natural environments change with the seasons.

BACKGROUND: Lassen like all National Parks has many important values. It is not just a seasonal recreation area. It has sustainable values year round, for all seasons. Each season has its influence on the park's biological and physical characteristics. All are interrelated and important affecting not only what is in the park, but many things outside the park as well. For example, Lassen is an important watershed. The amount of snow that falls in the park affects many downstream water users. Lassen is a seasonal home for many wildlife species such as deer and song birds. It is where they raise their young. Consequently, Lassen provides critical habitat for maintaining some of Earth's rich biological diversity. Lassen Volcanic National Park is also an outdoor classroom, a historical and cultural site, and one of America's enduring treasures. The park is an important place in all seasons.

INSTRUCTIONAL SEQUENCE: As with all field trips student enthusiasm will be greatly enhanced by prior learning. Provide the students with an introduction to the park. Use park maps, books, and/or video's to share and discuss information about the park. Ask the students why they think national parks such as Lassen are important. Make a class list from their answers.

This activity is divided into two parts. The first part is the field trip portion. The student activity page is used on the field trip. The second part is the classroom post field trip follow up. The questions at the end of the assessment are to be done back in class.

Prior to the actual visit trip to the park explain to the students that during their visit they are going to be scientists studying this particular season. They will be answering questions provided for them on a student activity sheet. Explain to the students that they will be working in pairs or individually (Teachers Choice). At the park they are to walk on a park trail or sit in a designated area to observe and answer the questions on their study sheets. Be sure groups/individuals can spread out so they have space/quiet for completing their task. Decide on space boundaries and time limits so it will be clear that everyone knows the parameters.

ENRICHMENT/EXTENSION ACTIVITIES: (1) Have the students draw a picture based on their park visit. Make sure that they include as many details as they can. (2) Have the students write a seasonal poem that captures the uniqueness of this place during this season.

ASSESSMENT: Have the students answer the Student Questions back in class. Discuss their answers. Have the students develop additional questions about the park based on what they observed and recorded on the field trip. Use all of their student work from this activity for assessment. An additional assessment would be to have students make presentations on their experiences to other classes and/or community groups. For these presentations they may need to make visuals about their experiences in the park.

Classroom Activity

Student Questions

1. Why are the forests in the park important all year?
2. Can the things you observed on the field trip be seen everyday of the year? Why?
3. Why is this season important to the park?
4. What other time of year would you like to visit the park? Why?
5. Lassen Volcanic National Park is an outdoor classroom. From your field observations put a circle around those subjects which you could study here during any season. Science, Art, Math, History, PE, Reading, and/or Writing
6. How might the changes in the seasons at Lassen affect you at home?
7. Explain what makes Lassen Volcanic National Park a special place for all seasons?
8. If people can't visit Lassen Park should it still be preserved? Why?
9. The following words describe different park values. Using your student activity page write one or more of these words next to each of the numbers. Ecology, Geology, History, Art, Fresh Air, People, Watershed, Classroom, Peaceful.

A PLACE FOR ALL SEASONS Student Activity Page

You are a park scientist who is trained to notice details and make accurate observations. On a separate sheet of paper answer the following questions and do the activities described below. You may wish to take notes on your observations to help in answering some of the questions.

1. Name of trail _____
 Date _____
 Time _____
 Season _____

2. Describe what the weather is like today in as much detail as possible.
3. Write down all the different colors you see on your walk. What colors are found only during this season?
4. Are there any insects out? Are they in the water, in the air, or on the ground? If your answer is no, why aren't there any insects out?
5. Do you see any birds or mammals? Keep track of how many different kinds you see of each during your walk. Do you think they stay here all year or live here only during certain seasons?
6. Is there snow on the mountains? Where does the melted snow go?
7. Can you see any changes in the forest that might of happened today? This season? This Year?
8. Find a place to sit down and be quiet for 5 minutes. Record all the sounds that you hear.

9. Describe the most beautiful thing you've seen today.
10. Describe the most amazing or unique thing you've seen today.

NATIONAL PARKS FOR THE 21ST CENTURY

SUMMARY: Students will write and develop solutions to current and projected problems in a national park.

GOAL: For students to develop an understanding of the complexity of managing a national park

OBJECTIVES: Students will (1) develop an understanding of key objectives recommended to guide the management of the National Park System in the 21st century and (2) apply their understanding of these objectives to solve current and projected park management problems.

GRADE LEVEL: Sixth through twelfth

TIME REQUIRED: This activity is divided into four parts. Each part takes 45 to 60 minutes, depending on grade level and length of class discussion. Parts I and II may be taught as separate lessons providing students with a introduction to national park management.

LOCATION: Classroom

MATERIALS: Background Pages and Park Management Team Pages - one per student. Orientation Page - for teacher use. Park Problem Pages - one divisional set per student group. Any resources on national parks in general or specific national park units will enrich this activity.

SUBJECTS: Social Science, Language Arts, Mathematics, Science

KEY WORDS: Legislation, Stewardship, Objectives, Natural and Cultural Resources, Management, Interpretation, Administration, Maintenance, Budget, Artifact

BACKGROUND: Before doing this activity, carefully read over the background pages which are based on the book, National Parks for the 21st Century, The Vail Agenda, Library of Congress Card Number: 92-60471, National Park Service Document Number: D-726, International Standard Book Number: 0-9603410-7-2. Also read the Park Management Team Pages. The full four-part activity correlates well with another activity in the "National Park Idea" curriculum titled "National Park System, The Way It Works."

INSTRUCTIONAL SEQUENCE:

Part I. As a class read and discuss the Background Pages and answer the three questions.

Part II. Read the Park Management Team Pages and as a class discuss how a national park is managed. Ask the students what division of park management they would like to work in and why.

Part III. Divide your students into five groups. Explain that each group will play the role of a working division in the National Park Service. Read the Park Orientation Page to the class. Pass out the Park Problem Pages. There is a Park Problem Page for each group (division) to focus its work. Each group discusses and writes solutions for its division's park problems.

Part IV. These written solutions will guide a class oral presentation that serves as the culmination of this lesson. Each division should be given five to ten minutes to share its problems and solutions. Make sure that groups are heterogeneously grouped according to reading ability. If reading is problematic, one student per group could be the reader or the teacher could read the selection to the class. All students should have a copy of the written materials in hand so they can follow along and refer to materials when they are answering questions and doing activities.

Some of the words in the Background Pages may be new to students. These include: Legislation, Promote, Regulate, Conform, Conserve, Unimpaired, Mission, Objectives, Resource, Stewardship, Adjacent, Access, Diverse, Unique, Attributes, Interpretation, and Complex. If some or all of these words are new to your students, list them on the board and have the students find and mark the words on their papers. Then the whole class or small groups can read them in context to develop definitions. Students may refer to this list as they read and discuss the activity. Each student should write his/her own answers.

EXTENSION/ENRICHMENT: (1) Students could hold a meeting and write their own "Vail Agenda" for the future of the national parks, perhaps giving it the name of their school or town. (2) Students could create a model for any part of the "Vail Agenda." For instance, they could plan (and implement, if possible) an educational program for the national park nearest them in which older students teach younger students about their park. (3) With your class discuss a situation (either a real one or one that could happen) that involves resource stewardship and protection in a national park. Write and/or be prepared to act out the story of the situation.

ASSESSMENT: Student work and presentations provide samples for assessment and inclusion in student portfolios. When each "division" of the national park presents its solutions to the class, the presentation and products to support the presentation can be used for assessment of each group or individual.

BACKGROUND

The original mission of the National Park Service was defined in 1916 by the legislation which created it:

"The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Though this mission remains the same today, more specific guidelines were needed to determine the current condition of the Park Service and to provide a future vision.

In 1991, a gathering of people from both government and private groups met to develop a written plan for the future of the national parks of the United States. In this written plan, the authors said:

"The National Park Service is charged with the management of the nation's most precious natural and cultural resources. These resources are inextricably woven into our national heritage, and they provide citizens the world over with invaluable opportunities for recreation, appreciation of beauty, historical reflection, cultural enrichment, and environmental education. It is the responsibility of those involved in park management and policy formulation to ensure the protection of the resources managed by the National Park Service. Yet, fulfilling this enormous responsibility is neither easy nor free of controversy."

The written plan that resulted from this work is called National Parks for the 21st Century, the Vail Agenda. In this book, the following four objectives help form the vision for the National Park Service:

Objective 1 - Resource Stewardship and Protection. The primary responsibility of the National Park Service must be protection of the park resources. Preserving and protecting the resources of the parks requires many different people working together. This means not only national park employees, but also property owners adjacent to the park, other people near the park, and sometimes with people far away. Additionally, visitor activities that might be appropriate at one site (a lake open to swimming at a national recreation area) may be totally inappropriate at another site (a lake closed to swimming to protect birds nesting at a national park). Rules and regulations for visitors must fit each site. The balance between visitor enjoyment and resource protection is always a delicate balance.

Objective 2 - Access and Enjoyment. Each park unit should be managed to provide the nation's diverse public with access to recreational and educational enjoyment of the lessons contained in that park unit, while maintaining unimpaired those unique attributes that are its contribution to the National Park System. While public access and enjoyment are essential elements of the park system, it should not be the goal of the National Park Service to provide visitors with mere entertainment and recreation. Instead, the public should be provided with enjoyment and understanding of each park in view of its special features. This is entertainment, education, and recreation with meaning.

Objective 3 - Education and Interpretation. It should be the responsibility of the National Park Service to interpret and convey each park unit's and the park system's contributions to the nation's values, character, and experience. Appreciation of a place, a time, or an event is in direct proportion to how much a person knows/learns about that place, time, or event. The challenge of national parks lies in the incredible diversity of people who visit them and in the diversity of the parks themselves. To meet that challenge, there must be a great variety of ways to learn about national parks, including (but not limited to): on-site visitor centers, professional interpreters, interpretation by other people, written and visual materials, educational outreach to schools, and research opportunities for interested professionals and students.

Objective 4 - Science and Research. The National Park Service must engage in a sustained and integrated program of natural, cultural, and social science resource management and research aimed at gathering and using the information needed to manage and protect park resources. Park management decisions must be based on the best information available, and that information must be founded on careful research about the human and natural systems in and around national parks.

The national parks of the United States are one of the greatest resources of all time. To assure that they remain "unimpaired for the enjoyment of future generations," every citizen must develop an understanding of the complex issues facing the National Park System so that the best decisions governing their future will be made on a firm foundation of understanding.

Questions

1. The legislation (law) that created the National Park Service in 1916 stated what the National Park Service would be and do. This legislation is written at the beginning of the background section. What does it mean? What does it say about how people can use national parks?
2. Primary means first or most important. Why are resource stewardship and protection the primary responsibility of the National Park Service?
3. Why is it important for people to be educated about the national parks?

PARK MANAGEMENT TEAM

The National Park Service employees that take care of our parks have many skills and perform a variety of jobs. They work in one of five management groups called divisions. The Superintendent is the park leader. He or she is responsible for making sure that all divisions work well together. The management divisions are described below. Think about which division you might like to work for if you were a National Park Service employee.

The Division of Administration plans the budget and helps with other financial matters within the park such as purchasing and payroll. This division is also in charge of all park property, buys supplies, and pays the bills. It makes recommendations to the Superintendent about how the budget is distributed between the divisions. Administration helps the rest of the park do their jobs. Administration is the park's business office.

The Division of Natural Resources Management is responsible for making sure that all the park resources, including plants, animals, water, air, water, and cultural artifacts, are preserved in as good a condition as possible. Resources Management works closely with all the other divisions to ensure that natural and cultural resources are protected. Its responsibilities include inventorying and monitoring park resources. This division also conducts research to learn more about the park resources. And it works to correct problems that might be harming the park. The people that work in Resources Management are biologists, scientists, geologists, or even archeologists.

Employees in the Division of Maintenance are required to do many different types of work. Maintenance workers are the people who do the carpentry, plumbing, and electrical repair in the park. They also clean and maintain park facilities. Maintenance crews take care of the roads, trails, and signs. They provide clean restrooms, pick up litter, empty trash cans, provide safe drinking water, and repair anything that becomes broken. Maintenance is very important to the overall protection of the park resources.

The Division of Visitor & Resource Protection Park rangers have a full range of duties including: road and trail patrol, fire suppression and control, search and rescue, first aid, wilderness management, fee collection, handling all emergency operations, and law enforcement. Park rangers working in law enforcement protect the resources by making sure that visitors follow the park rules. They inform visitors about the rules, but may give tickets to people who do not follow the rules.

The Division of Interpretation and Cultural Resources is responsible for interpreting (communicating) information about the park's natural and cultural resources. Park interpreters are also responsible for increasing public awareness and understanding of the values of our National Park System. This is accomplished through visitor center exhibits, campfire programs, guided walks and tours, brochures, pamphlets, signs, bulletin boards, and educational programs. The park visitor centers and museums are managed by the division as well as the collection and exhibition of cultural resources. The Division of Interpretation works closely with all divisions.

ORIENTATION PAGE

It is the year 2010 and you work in Wonderland National Park, California, a beautiful park located in the Cascade Mountain Range. It is an easy two-hour drive from large urban areas. The park has many beautiful lakes and streams. It is a land of volcanoes and thermal areas where hot springs bubble to the surface. A single two-lane road runs through the center of the park from north to south. The road is open only in the summer and fall, as winter snows keep it closed the rest of the year. Winter access is limited.

The most popular summer visitor use area in the park is at scenic Summer Lake. The largest park campground is located within one-fourth mile of the lake; it includes a picnic area and a camper store that sells groceries, souvenirs, gifts, and other camping basics. There is a small visitor center/museum, as well as a ranger station and park maintenance facilities. Summer Lake is an outstanding recreation and wildlife habitat area. Because of its scenic beauty and easy accessibility, overuse by people in the Summer Lake area is threatening park resources. Other places within the park are also being affected by visitor overuse.

In the last 25 years, the population in the counties surrounding the park has grown to 1,250,000 people. Visitation in the park has grown to over 1,000,000 per year with visitors coming from all over the world. Management compared to the past has become complex causing conflicts between the need to protect park resources and to allow public access and enjoyment. Managing and running a national park requires careful planning and good decision making.

Your class is the management staff of Wonderland National Park. Using the Park Problem Pages, your task is to develop solutions for current and projected park problems which best protect its resources and allows public use. The solutions you develop will provide the guidelines for running Wonderland. Be sure that each division solves its problems in a way that best protects the park and provides for visitor use. A recommendation for action with justification must be included by each division.

DIVISION OF MAINTENANCE - PARK PROBLEM PAGE

Taking care of a national park used by almost one million people requires a lot of maintenance and upkeep. It takes a professional staff of skilled, trained people to maintain all of the facilities used by the public and by the national park staff. The Maintenance staff takes care of the roads, trails, campgrounds, and picnic areas. Besides these facilities, there are buildings which include historic structures, visitor centers, garages, houses, and office buildings that require maintenance. It is a lot of work to maintain a national park. There are also trash, sewage, and utilities (water and electricity) that have to be taken care of in order to keep the park open and safe for people.

With a limited amount of employees and money to maintain the park this year, the Maintenance staff has to determine which projects have to be done in order to keep the park open and provide the best visitor services. You can only choose five projects that need to be done this summer. The remaining projects will have to be done at a later date. As a group, choose and make a list of the five top projects. Then write down your reasons for choosing each project.

1. Repaint the headquarters office building.
2. Open and maintain water systems in campgrounds.
3. Open all campgrounds that were closed in winter.
4. Resurface park roads.
5. Rewire the electrical system in the Science Center.
6. Put new roofs on the seasonal employee houses.
7. Build recycling bins for the campgrounds.
8. Paint the benches at the Summer Lake amphitheater.
9. Make new trail signs for the backcountry trails.
10. Rebuild and restore four historic buildings.
11. Rebuild trail bridges damaged by winter snow.
12. Repair boat launch at Summer Lake.
13. Clear trails of fallen trees.
14. Install lights in visitor center.
15. Build new picnic area.

DIVISION OF VISITOR & RESOURCE PROTECTION - PARK PROBLEM PAGE

The Summer Lake area is one of the most popular areas in the park. It has a campground, picnic area, access to trails, and great fishing. Because of its popularity, the area is getting overrun by people. More and more people create more problems for the rangers who are trying to protect the park and also provide for visitor safety.

In order to provide the best service to the public, with a limited staff, the Chief Park Ranger and his/her district rangers have to decide on the best way to deal with park problems. With only two park rangers available at any one time in the area of Summer Lake, the Chief Park Ranger and the district rangers have to make sure their staff knows what problems should be taken care of first. Your job is to put the following situations needing immediate ranger assistance (help) in an order of one to ten. Number one would be the highest priority and number ten the lowest. You then need to be able to explain to the class why you chose the order you did.

1. A camper cuts a finger on an axe while cutting firewood.
2. A dog is running loose at the lake and is chasing ducks which is not allowed in a national park.
3. Children and adults are feeding deer in the campground which is not allowed in a national park.
4. A camper reports an "out of control" small fire at the campground.
5. A visitor has locked his keys in his car at the visitor center and needs the rangers to help open his car.
6. A visitor is picking flowers and collecting rocks at the picnic area which is not allowed in a national park.
7. A visitor wants to talk with a ranger about night camping in the park's wilderness area.
8. There is a Black Bear on the park road creating a traffic problem.
9. Some kids are swimming in the "no swimming area" of the lake.
10. A visitor has lost her camera and wants to report it to a ranger.

DIVISION OF INTERPRETATION & CULTURAL RESOURCES
PARK PROBLEM PAGE

With more and more people visiting the park each year, especially the Summer Lake area, the Division of Interpretation, with its limited staff, is faced with the challenge of how to best educate and inform the visitors about the park and its resources.

Expecting a busy summer, the Interpretive staff is looking at other methods in addition to traditional ranger-led walks, talks, and campfire programs to teach visitors about the park. The staff has come up with a list of eight methods for informing visitors. It is a real challenge because park visitors are children and adults from not only the United States, but from all over the world. The methods must be carefully looked at by the staff. As part of the Interpretive staff, your job is to choose three methods that you feel will be used most often by three groups: (a) families, (b) adults, and (c) children. Make a list of your choices for each of the three groups. The same method can be used by more than one group. The interpretive methods for sharing information about the park are listed below.

1. Self-guided trail brochure - interpretive brochures used with numbered posts along nature trails that inform visitors about special features.
2. Cassette and/or CD interpretive guides - audio guides used to explain park features along its roads, in historic buildings, or about exhibits, and an orientation guide to the park.
3. Roadside exhibits - displays and signs along roads at turnouts, scenic overlooks, historical buildings, and at special places that provide information about the park's natural and cultural history.
4. Books and pamphlets - written information sold in visitor centers, park stores, and ranger stations that provide specific or general information about the park. Some book titles: Trees of Wonderland National Park, Flowers of Wonderland, Wonderland's Volcanoes.
5. Videos - tapes providing a general park overview or specific information about a major subject of interest in the park. Videos are 15 to 60 minutes long and are purchased by visitors. Videos are also shown in the visitor centers to provide new visitors with park orientation or information.
6. Park newspaper - a small paper (eight pages or less) published by the park which is given to visitors as they enter the park. It contains a wide variety of park information.
7. Self-guided junior ranger programs - programs that provide children with activities to learn and discover the park's natural and cultural history.

8. Self-guided family discovery programs - programs that provide families with a variety of activities to learn and discover the park's natural and cultural history.

DIVISION OF NATURAL RESOURCES MANAGEMENT - PARK PROBLEM PAGE

Summer Lake has been a popular lake to fish for trout for over 100 years. A fish stocking program (placing fish raised in hatcheries in park lakes) has been in existence for over 60 years to provide more fishing opportunities for visitors. In keeping with the goals of the National Park Service of protecting the park's lake ecosystems, the fish stocking program is going to be stopped at Summer Lake and all other lakes beginning next summer. The Resources staff is concerned that Summer Lake will be fished out in the next few years if it is no longer stocked and individuals are still allowed to catch five fish a day. The staff needs to come up with a plan to maintain a healthy trout population; it may mean people can no longer fish the lake.

There are many other things to consider in making a decision about fishing at Summer Lake. The lake is a community made up of many interrelated lifeforms. Mammals, insects, amphibians, and many different plants call Summer Lake their home. It is a nesting area for a diverse bird population including Canada Geese, mallards, warblers, and a variety of songbirds. It is also an important resting site for birds on long migratory flights. The decisions made on managing the lake affect more than just people and fish.

The division has come up with the following list of management options. Your job as resource managers is to come up with what you feel is the best option for providing public enjoyment of Summer Lake and protecting the lake and its fish population. Be prepared to explain which option you choose and why to the class.

1. Allow no fishing in the lake at all. Possible impacts: (a) people would have to go to other places to fish, (b) no fishing by the public could result in more wildlife using the lake, (c) trout populations could increase on their own, and (d) people would be upset at losing their right to fish and complain.
2. Allow visitors to catch a limit of two fish. Possible impacts: (a) people could still enjoy fishing at Summer Lake, (b) the lake could be fished out, resulting in a lake with no fish, and (c) decline in wildlife due to the increase in people and the lack of fish as a possible food source.
3. Allow for "catch and release" fishing at the lake (catching fish with barbless hooks and returning them to the lake). Possible impacts: (a) visitors could enjoy fishing without depleting the lake of fish, (b) wildlife dependent on fish such as Bald Eagles could use the lake, maintaining a well balanced lake ecosystem, and (c) the Resources staff would be keeping within the guidelines for protecting and preserving the park.
4. If you do not like any of the options above, come up with your own.

DIVISION OF ADMINISTRATION - PARK PROBLEM PAGE

The park budget needs to be reduced by 10 percent over the course of the next five years. The Superintendent and his/her Administrative staff must make \$100,000 worth of cuts in order to balance the budget. As part of the Division of Administration you need to carefully examine all of the items on the Budget Page and their impacts. As a group you then need to choose the items you wish to cut that total \$75,000.

The Superintendent has told you that you can not cut high priority items such as health/safety, visitor protection, and law enforcement. Remember, you also want to protect the park resources while providing for public use. These are tough decisions that have to be made. Be prepared to share the list of items you are cutting in the budget with the rest of the class. Remember, the items have to add up to \$75,000.

| PROPOSED CUTS | IMPACTS | SAVINGS |
|---|--|----------|
| Eliminate Backcountry Ranger | 8,000 visitors not served, limited monitoring of park resources | \$ 8,000 |
| Shorten Operating Season at Prime Visitor Contact Areas (June 20-September 4) | 10,000 visitors not served, visitor center and campgrounds would close early (visitor impact) | \$17,000 |
| Cut Water/Sewer Operations Parkwide | Will result in an increased number of visitor complaints due to lack of water and closed restrooms, would affect 450,000 visitors annually | \$35,700 |
| Close Winter Use Area | 20,000 visitors not served, school programs would be eliminated, increased problems with the winter visitor center because of inattention to its maintenance | \$35,000 |
| Eliminate One Employee from Division of Interpretation | 5,000 visitors not served, 120 interpretive programs eliminated | \$ 6,000 |
| Shorten Season for Three Maintenance Employees (Road Crew) | Deterioration of roads and buildings and increased long term costs from not performing maintenance | \$11,000 |
| Eliminate Trail Maintenance | Deterioration of 150 miles of trails, portion of Pacific Crest Trail would be affected, 8,000 visitors impacted | \$19,000 |
| Reduce Number of Portable Toilets at Visitor Center | Would affect 450,000 annual visitors, cause lines at available toilets, impact maintenance of remaining facilities | \$ 7,000 |
| Reduce Maintenance of Park Facilities | Visitors impacted by reduced maintenance of headquarters area grounds, buildings, restrooms, and trash removal | \$ 5,000 |
| Delay Road Opening Three Weeks | 62,000 visitors not served, impact on concession operations, economic hardship for counties surrounding the park | \$25,000 |
| Delay Summer Lake Campground Opening Three Weeks | 5,000 visitors not served | \$15,000 |
| Close Two Campgrounds | 8,000 visitors not served | \$25,000 |



United States Department of the Interior

NATIONAL PARK SERVICE
Lassen Volcanic National Park
Post Office Box 100
Mineral, California 96063-0100

IN REPLY REFER TO:

Dear School Group Leader:

Lassen Park is a very special place. It is one of 375 units comprising the National Park System. Administered by the National Park Service, the National Park System contains the finest examples of America's natural and cultural heritage. The National Park Service has been entrusted to protect, preserve, interpret and administer these areas for the benefit of present and future generations.

In order to carry out the mandates of the National Park Service as directed by Congress, we ask for your cooperation as a park visitor to help protect and preserve all natural features and objects during your visit. With the increasing number of school groups using Lassen (we serve 23 counties and hundreds of schools), it is important that all groups abide by park rules and regulations. To reduce the impact on the resources and to provide for a safe, enjoyable experience for all visitors, we ask that you share with all of your group's participants the following regulations.

1. **No collecting or removal of any objects from the park such as rocks, wildflowers, pine cones or cultural artifacts is allowed.**
2. **Please stay on designated trails and boardwalks. This is especially important in our hydrothermal areas such as Bumpass Hell and Sulphur Works and the Lassen Peak and Cinder Cone trails.**
3. **No short-cutting of trails is allowed.**
4. **No feeding of wildlife is permitted.**

Trail Use

1. **Groups are limited to 35 people hiking together on the same trail.** Groups larger than 35 will have to break into smaller groups, disperse to other trails or stagger their use on the same trail so no more than 35 people are hiking together at one time.
2. The only exceptions to this trail group size limit is on the Sulphur Works boardwalk and the Devastated Area walkway. There are no group size limitations on these two areas.

To ensure student safety and the protection of the resources for future generations, we ask for your full cooperation in abiding by the park rules and regulations. **The message to share with all participants in your group regarding national parks can be simplified into three words "preserve and protect."**

Thanks!



The Lassen Park Staff
(9/97)

LASSEN VOLCANIC NATIONAL PARK
Guidelines for a Safe Visit

1. Remain with your group.
2. Avoid horseplay. Throwing rocks, running, etc. can mean injury for people or the very items we come to enjoy.
3. Walk slowly, look carefully. Respect and protect all living things and cultural objects.
4. Return all living organisms to their habitat after brief observation. Do not disturb cultural artifacts.
5. It is against the law to remove any objects from the park. This includes rocks, flowers, pine cones, and cultural artifacts.
6. Stay on designated trails or boardwalks. When you take shortcuts on a trail, rains and wind begin to erode the disturbed area, washing dirt and debris into streams and tearing down hillsides. If you see places where careless people have taken shortcuts, be sure that you stay on the established trail.
7. Do not feed any wildlife. They could carry diseases and they could bite you. Wildlife and their habitat are in balance. When we disturb the balance, we aren't leaving the park in its natural form for future generations.
8. Respect the quiet of the environment. You will see and hear much more if you listen more and talk less.
9. Do not litter. If you see trash, pack it out.

The park belongs to all of us. We are all responsible for its care and protection, to leave it for people of all time.

CUT ALONG DOTTED LINE AND GIVE TO RANGER UPON ARRIVAL AT PARK

I have read the Guidelines for a Safe Visit. I understand their importance to a safe and enjoyable visit to Lassen Volcanic National Park. I realize that I may be asked to leave if I fail to observe these rules.

Student's Signature

Parent's Signature

**LASSEN VOLCANIC NATIONAL PARK
EDUCATION PROGRAM RESERVATION SCHEDULE**

Lassen Volcanic National Park serves public and private schools from thirty-six California counties, grades kindergarten through college. All our ranger-led education programs are designed to meet the individual needs of classes and CA State curriculum standards. Programs are very popular and dates fill quickly, so make reservations early. The number of programs we can offer depends on park staffing and funding.

Please call Nancy Bailey or Steve Zachary at (530) 595-4444 extension 5133 or 5132 to schedule programs as early as possible.

Call on or after November 1 for January to April snowshoe programs

Call on or after February 1 for May to July programs

Call on or after June 1 for August and September programs

PROGRAMS OFFERED

| Title | Location | Months | Length | Group Size |
|---|--|----------------------|-------------------|-------------------|
| Winter Ecology Snowshoe Program | Southwest Entrance | January-April | 1.5-2 hours | 35 |
| Winter Survival/Snow Shelter Program | Southwest Entrance | January-April | 2 hours | 35 |
| Volcanoes of Lassen Demonstration | Various Sites | May-September | 30-60 minutes | No limit |
| Introduction to Lassen Volcanic N.P. | Various Sites | May-September | 30 minutes | No limit |
| Hydrothermal Features | Bumpass Hell Parking Lot | July -September | 30-45 minutes | No limit |
| | Sulphur Works | May-September | 30-45 minutes | |
| Lassen Habitats: Intro to plant and animal communities | Various sites, including Manzanita Lake, Lily Pond | May-September | Varies with class | No limit |
| Lassen Peak: Intro to its history and eruption sequence | Devastated Area and Lassen Peak Parking Area | August and September | 20-30 minutes | No limit |



United States Department of the Interior

NATIONAL PARK SERVICE
Lassen Volcanic National Park
Post Office Box 100
Mineral, California 96063-0100

IN REPLY REFER TO:

Rev. 3/03

ENTRANCE FEE WAIVER APPLICATION

Please complete this form and return with appropriate documentation AT LEAST TWO WEEKS PRIOR to your desired dates to: Lassen Volcanic National Park, Fee Office, P.O. Box 100, Mineral, CA 96063-0100 or FAX attn: Fees 530-595-3262

Name of School: _____

Address: _____

County _____ School District _____ Telephone _____ FAX # _____

Person in charge of group: _____

Number in Group: _____ Number of cars or buses: _____

Date (s) Desired: _____ through _____

Purpose of visit: _____

List trails you will be on: _____

JUSTIFICATION:

_____ Bona fide educational institution conducting trip for purpose of studying resources related to the park. Must provide documentation of official recognition as an educational institution (see next page) and a copy of your learning objectives. If you have scheduled a ranger-led program, please supply Ranger's name: _____

_____ Bona fide research group studying resources related to the park. Must provide documentation of official sponsoring study institutions.

**** YOU MUST HAVE A COPY OF THIS WAIVER IN EVERY VEHICLE OR YOU MAY BE CHARGED THE ENTRANCE FEE.** It must be shown at the park entrance station upon arrival. (This form must be signed by NPS to be valid).

FEE WAIVER APPROVED _____ NOT APPROVED _____

Signature _____ Date _____

Fee Office: 530-595-4444 Ext. 5140

GROUPS ARE LIMITED TO 20 PEOPLE EACH SPACED AT LEAST 1/2 MILE APART AT ALL TIMES ON ALL PARK TRAILS. GROUPS MAY NOT CONGREGATE ON ANY TRAILS.

Documentation of official recognition as an educational institution must be on file in the Fee Office or accompany this fee waiver application or we cannot process your request. Schools are encouraged to send their documentation of official recognition prior to application in order to expedite the fee waiver request process.

School groups or outings conducted for educational purposes by schools or other bona fide educational institutions qualify for a waiver of recreation fees if the following **TWO** criteria are met.

1. Documentation Required:

A waiver applicant is required to provide documentation of their official recognition as an educational institution by a Federal, State or local government entity.

It is insufficient for applicants to state that they have this recognition or imply it in their letter or literature.

Examples of acceptable documentation include, but are not limited to:

- a. Public Schools: Letter from the school's County Office of Education attesting to the school's education status and legitimacy including school name, address, phone number and CDS Code (California schools). One-time letter will be filed in a permanent file.
- b. Accredited Schools (including Home Schools): Certificate of Accreditation from an official accrediting body or County Office of Education. Valid through the expiration date of the certificate.
- c. Private Schools or Scientific Institutions: Letter from the Internal Revenue Service or similar State tax authority, granting an educational tax exemption (i.e. IRS Determination Letter). Valid through the expiration date of the letter.
- d. Non-school groups/organizations who are officially recognized by a school or scientific institution for the purpose of providing educational credit hours based on a specific course of instruction: Official letter from the school or scientific institution attesting to the official recognition or affiliation. Letter must be renewed annually.

2. Statement of Visit Purpose:

The applicant is required to provide a statement as to the purpose of the proposed visit.

A general statement to the effect that the visit is for "educational purposes" is insufficient by itself. An explanation of WHAT the educational purpose entails and HOW it relates to park resources is required.

If you have any questions regarding the documentation requirements, please contact Revenue and Fee Business Coordinator, at 530-595-4444 ext. 5140

STRATEGIES FOR SUPPORT OF FIELD EDUCATION

The support of administrators, parents, and school boards is critical to field experiences as culmination/extension events for classroom studies. The following suggestions can help assure that all partners in education understand the value of these activities that form foundations for lifelong learning.

If parents go on field trips, pre-trip information for parents should be distributed. This might include guidelines for safety/appropriate behavior, consequences of inappropriate behavior, resource materials/equipment, extra pencils, and a pencil sharpener. For extended trips, meetings with parent leaders will help develop consistency in expectations about the behavior and academic goals of the trip. Parents may also be introduced to the major academic concepts to assure that they are involved not only as chaperons but as lifelong learners.

Student pre-trip activities should include home discussions about what they are learning and where they are going. One way is to have students ask if anyone in the family knows about or has visited the site of the field trip and share findings the next day. This may open up opportunities for extended learning. When teachers take advantage of these opportunities, inviting parents or others into the classroom, learning becomes connected to the rest of the world.

After the trip, in addition to journal entries and other activities which capture the learning and memories for students, thank you letters to parents and others will assure that students recognize and express appreciation for the role those people play in providing the experience. A brainstorming session covering aspects of the trip will give students specific places and experiences to mention in their letters as being particularly meaningful to them.

Articles in class, school, or local newspapers can be submitted by students. A team of students can be responsible for this aspect of recording the trip and finding out about publications so they submit appropriate articles, drawings, or photographs.

Student school board presentations about the field trip will keep the board informed about the importance of the trip to the overall educational program.



Resources contains information available to teachers such as videotapes and books and handouts on volcanology, geology, history, plants and animals, Indian uses of plants, etc.



United States Department of the Interior

NATIONAL PARK SERVICE
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IN REPLY REFER TO:

(9/97)

RESOURCES AVAILABLE TO TEACHERS LASSEN VOLCANIC NATIONAL PARK

1. Instructional Materials

Interpretive Leaflets for Self-Guiding Trails

Boiling Springs Lake
Bumpass Hell
Cinder Cone
Indian Ways
Lassen Peak
Lily Pond

Educational Curriculum

Biological Diversity - Grades 4-6 (10 units each dealing with a specific concept relating to biological diversity)
Volcanoes/Earth Science - Grades 2-4, 5-9

Videotape and Filmstrips

List and description of available audiovisual materials is included in education packet.

Publications and Educational Materials

A list of publications about the human and natural history of Lassen Park is included in the education packet. For further information, write to the Lassen Loomis Museum Association, P.O. Box 100, Mineral, CA 96063-0100 or telephone (530) 595-3399.

2. Summer and Winter Interpretive Programs

See schedule of activities in the summer or winter issue of the Lassen Park Guide, the park's newspaper.

3. Group Educational Programs in Lassen Park (Walks, Talks and Demonstrations)

Programs for schools and organized groups year-round on a variety of natural and cultural history topics. Advance reservations are required.

4. Winter Snowshoe Program (for Educational Groups)

Educational snowshoe walks emphasizing winter ecology and Lassen's geologic history. Also special programs on snow shelters and winter survival. Snowshoes provided by the park. Programs available December through March. Advance reservations required. Participants must be at least 8 years old. Group size limited.

5. Outreach

On a limited basis we provide onsite school presentations on physical and biological science topics. Advance reservations required.

6. Environmental Education Sites Used by Teachers in Lassen Park

Due to the closing of the road through the park in late fall and heavy snows in winter, many of the sites listed are only available between mid May and mid October. Check with the park for actual opening and closing dates of roads and sites within the park. Groups are limited in size on many park trails.

Bumpass Hell
Cinder Cone (Butte Lake)
Devastated Area
Devils Kitchen/Boiling Springs Lake (Warner Valley)
Hat Lake
Hot Rock
Juniper Lake
Lassen Peak
Lily Pond
Manzanita Lake
Nobles Emigrant Trail
Reflection Lake
Sulphur Works

Group Campsites Available in Lassen Park

Juniper Lake
Lost Creek

7. Educational Wayside Exhibits (Locations)

Devastated Area
Devils Kitchen
Hot Rock
Lassen Peak
Sulphur Works

8. Library

Lassen Park has a 400+ volume library containing books and technical papers on the human and natural history subjects of Lassen Park and the surrounding region, interpretation, environmental education, resource management, National Park Service history and other national parks. Use of the library is available by appointment only.

9. Professional Resource Managers

We have a full-time staff of professional resource managers that would be happy to answer questions or assist teachers with information regarding Lassen Park resource management issues.

10. Educational Expertise

The educational branch of Lassen Volcanic National Park is part of the Division of Interpretation and Resources Management. The staff is made up of trained professional park ranger/naturalists competent to teach and share information about Lassen Park and its related natural and human history. Our naturalists pride themselves in their ability to work with people of all ages in a variety of indoor and outdoor settings. Lassen Park naturalists are dedicated to providing high quality educational services to you, the park visitor, through a variety of creative, interpretive methods and techniques. Feel free to contact Education Coordinator Steve Zachary by writing to Lassen Volcanic National Park, P.O. Box 100, Mineral, California 96063-0100 or by telephoning (530) 595-4444 extension 5132 or 5133.

11. National Education and Information Networking

The Division of Interpretation at Lassen Park has access to a wealth of people and resources pertaining to the human and natural history of America through communication and cooperation with the 369 units of the National Park System. This includes national parks, national monuments, national historic sites, national recreation areas and other units under the management of the National Park Service, Department of the Interior.

12. General Park Information

May be requested by writing to Lassen Volcanic National Park, P.O. Box 100, Mineral, California 96063-0100 or by calling (530) 595-4444 extension 5134 or 5133.



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Lassen Volcanic National Park
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(530) 595-4444 ext. 5133

VIDEOTAPES AND FILMSTRIPS

Several interpretive programs are available for free loan to schools from Lassen Park. There are two videotapes which are 12 to 14 minutes long. There are also seven filmstrips which include a script to be read by the teacher; a total of ten scripts have been prepared for various age groups, and though the title and filmstrip will be the same, the narration varies according to the grades indicated.

Programs should be requested two to three weeks in advance to allow ample time for handling and mailing, and they should be returned promptly in order to have them available for others.

VIDEOTAPES, GRADES 5 THROUGH ADULT

Lassen Volcanic National Park: Land of Renewal features information about the human and physical geography of the Lassen Park area.

Lassen Volcanic National Park: Volcanoes, Glaciers, and Fumaroles highlights the fascinating geological story of Lassen Park.

FILMSTRIPS, GRADES 1-4

1. **Life of a Tree** explains the life of a tree from seed through death and beyond. It describes various parts of a tree and the functions they perform; how a tree grows; how seeds are formed; and enemies and friends of trees.
2. **The Story of Lassen Volcanic National Park** begins with a simple explanation of how the mountains were formed. It then follows the seasons showing some highlights of the park. Pictures of trees, flowers, birds, mammals, and insects are included along with scenes in winter and park snow removal operations in spring.
3. **Through the Seasons** depicts seasonal plant and animal changes in Lassen Park. Starting with spring, examples include butterfly-egg-caterpillar-chrysalis, flower to fruit, bud to falling leaves of trees, nest building-egg laying-raising young, and the migratory flight of birds.

FILMSTRIPS, GRADES 5-8

4. **Through the Seasons** features the same pictures as No. 3 in Grades 1-4, but has a more technical script.
5. **Life of a Tree** features the same pictures as No. 1 in Grades 1-4, but has a more technical script.
6. **The Forest** explains the formation of a forest, step by step, from volcanic rock to mature trees, and beyond. Ecological interrelationships between plants and animals that precede and exist in a mature forest are emphasized.
7. **Story of Lassen Volcanic National Park** features the same pictures as No. 2 in Grades 1-4, but has a more technical script.

FILMSTRIPS, HIGH SCHOOL AND SOME GRADES 7-8

8. **For All People, For All Time** tells the story of the national parks from their original conception in 1870 around a campfire in Yellowstone and its establishment as the world's first national park. It includes information on the creation of additional early parks and monuments, the establishment of the National Park Service to administer these parks, and other changes up to the present time. The purposes and objectives of the Service and various types of units in the National Park System are explained.
9. **Mountains in Bloom** is a philosophical treatment of a man's role in nature, using the flowering plant life, both herbaceous and woody, of Lassen Park as a setting. Ecological aspects are emphasized rather than straight identification, and this overall approach is designed more for thought-provoking discussion than for information alone, though many plants are identified.
10. **Lassen's Landscape** explains the geological story of Lassen Park, concentrating on the last 35 million years when the Columbia Plateau was formed. The formation and destruction of old Mt. Tehama, the development of Lassen Peak, the volcanic activity of 1914-21, the Chaos Crags and Cinder Cone activity, and the sculpturing and erosive action of natural forces are described. A speculative account of Lassen's probable future landscape is proposed.

A list of publications about the human and natural history of Lassen Park can be obtained by writing to the Lassen Loomis Museum Association, Post Office Box 100, Mineral, California 96063-0100.

BOOKS AVAILABLE FROM LASSEN LOOMIS MUSEUM ASSOCIATION

Books can be purchased at Park Headquarters and at the Loomis Museum (during summer) or by mail by writing to the Lassen Loomis Museum Association, Post Office Box 100, Mineral, California 96063-0100 or by calling (530) 595-3399.

Road Guide to Lassen Volcanic National Park, Decker

Illustrated guide to the park's major natural features as seen from the park road

Trail Leaflets: Lassen Peak, Bumpass Hell, Cinder Cone, Boiling Springs Lake, Lily Pond

Leaflets to accompany the numbered markers on these popular self-guiding trails

Eruptions of Lassen Peak, Loomis

Eye-witness account of the 1914-15 eruptions with original Loomis photo

These Happy Grounds, Strong (being revised under new title)

Administrative history of Lassen Park

Lassen - His Life and Legacy, Swartzlow

Story of Peter Lassen, early California pioneer, and the Lassen Trail

Lassen's Place Names, Schulz

The origins and meanings of the place names in Lassen Park

Nobles' Emigrant Trail, Amesbury

Story of the trail discovered by William H. Nobles which played a major role in the development of Northern California

Lassen Volcanic Nature Guide, Eifert

A visual key to over 100 common animals, birds and plants of Lassen Park

A Field Guide to the Flowers of Lassen Volcanic National Park, Showers

An illustrated guide to the park's more common plants

Trees and Shrubs of Lassen Volcanic National Park, Nelson

Field guide with identification key and illustrations

Through Vulcan's Eye, Kane

An in-depth analysis of Lassen's geology

Indians of Lassen Volcanic National Park and Vicinity, Schulz

Life and customs of the Hat Creek Indians with drawings

Lassen Trails, Matteson

A brief guide to park trails with maps

Hiking Trails of Lassen, Perkins

A detailed description of the trails in Lassen

Wild Wonders of Lassen Park, Brown

A learning and activity book devoted to Lassen Park

Lassen Volcanic: Land of Renewal

An 11-minute introduction to Lassen Park and its features

Volcanoes, Glaciers and Fumaroles

A 14-minute description of the park's formation and volcanic and geothermal features

Lassen Volcanic National Park Natural History Poster, Eifert

A key and colorful poster showing park flora and fauna

Postcards

Nine different black and white views of eruption scenes with descriptions

Volcano: A volcano is a vent in the earth's crust from which molten (or partially liquid) rock or steam issues. The term volcano is also popularly applied to the volcanic structure (hill or mountain) which is usually built from the material ejected from such a vent. While in the earth's crust, molten rock is known as magma. Once it issues from the vent, both the liquid material and the solid rock it forms are known as lava.

Magma is found in pockets within the earth's crust. These are known as magma chambers. The formation of these magma chambers is probably the result of several factors. Temperatures increase with depth so that 40 miles below the earth's surface temperatures may reach 2200°F. One might expect these rocks to be liquid, but because of the great pressure which exists at this depth, they are solid or semi-solid. When a reduction in pressure such as is associated with a buckling of the earth's crust occurs, then these rocks can liquefy. Liquefaction may also be brought about by increased heat, possibly due to friction along faults or by pockets of radioactivity in the crust. The depths of magma chambers vary from a few to twenty or more miles. Once they form, magma tends to rise or be forced to the surface through cracks or fissures. The magma chamber then becomes known as a feeding chamber.

Materials ejected from a volcano vary because as magma cools its components separate. The first materials to crystallize are relatively poor in silica oxides and rich in iron, calcium and magnesium. These sink to the bottom of the chamber, leaving lighter materials which are relatively richer in silica oxides on top.

A major effect of crystallization within the chamber is a concentration of gas within the remaining liquid. Ultimately, the gas pressure becomes too great for the reservoir roof to withstand and eruptions begin. Initial eruptions reduce the pressure, allowing more gas to separate from the liquid. Thus the eruptions become self-sustaining and gas is their driving force.

The principal gas is steam (H_2O) which can comprise as much as 95 percent of the discharge. Second is carbon dioxide (CO_2), and third is sulfuric acid (H_2SO_4) -- the gas that gives volcanoes their characteristic odor. Gases released in minor amounts include hydrogen, ammonium chloride, carbon monoxide, nitrogen, chlorine, and fluorine.

Eruptions may occur at any stage in the cooling and separating process and fissures may tap any level of the feeding chamber, resulting in a variety of lavas and volcanic products and formations. Lavas are primarily classified according to their silicon dioxide content, although the presence of other chemicals, texture, percentage and size of gas cavities, amount of crystallization, and size of crystals are also important.

Because silicon dioxide acts as an acid, lavas with silicon dioxide content exceeding 66 percent by weight are known as silicic lavas. Two of these are found in Lassen Volcanic National Park. Rhyolite has a silicon dioxide content of about 75%, while that of dacite is about 70 percent. These white to grayish or pinkish lavas are stiff and viscous even at high temperatures and thus permit gas to escape with difficulty often resulting in explosive types of eruptions.

A lava flow which appears rough and blocky is called Aa (ah-ah), while a smooth, ropey or cordlike looking flow is known as pahoehoe (pa-hoy-hoy). Whenever lava flows into water and cools rapidly, it forms balls or spheres up to several feet in diameter and is known as pillow lava. Sometimes fluid lavas form lava tubes as they cool. These interesting caves are formed when the outer surface of a flow cools and hardens while the interior is still fluid. The interior lavas then continue to drain out the end of the flow, leaving a hollow tube behind.

Sometimes a lava flow is so viscous (characteristic of acid lavas) that it cools before it has had a chance to crystallize. Then volcanic glass or obsidian is formed.

A bowl-shaped depression or crater is usually associated with the vent of a volcano as a result of the force of explosions. These rarely exceed three-quarters to one mile in diameter. Sometimes as a result of the draining of magma chambers, support is removed from the roof of a volcano and it may collapse on itself. Or perhaps a particularly violent eruption may blow the top away. In either instance, a caldera or depression much larger than the crater is formed. Calderas usually have steep sides and may have diameters of five to ten miles.

Some of the types of eruptions associated with volcanic activity are:

Icelandic: Lavas escape from fissures, rather than from central vents. More copious flows produce no volcanoes, but rather large, level plateaus such as the Columbian Plateau.

Hawaiian: Typified by fluid basaltic lavas in which gases are liberated quietly. Thus little or no fragmental material is produced, although fountains of lava may be projected by jets of escaping gas to heights of 1,000 feet or more. Abundant outpourings produce flat lava domes forming some of the largest mountains on earth, such as Mauna Loa.

Strombolian: Named after a volcano off the coast of Sicily, these eruptions tend to be of moderate intensity and occur at more or less regular intervals. Eruptions are accompanied by white vapor clouds and throw out glowing clots of magma (scoria) which cool to form bombs and lapilli. These eruptions occur with more viscous basalt and mafic andesite lavas.

Vulcanian: Although named after Vulcano, Italy, Vesuvius provides better examples of this type of eruption. Here, the crater crusts over solidly between infrequent eruptions. Then strong eruptions, sometimes sufficient to disrupt the cone, occur blowing out the obstruction. Pinos or huge cauliflower-like clouds of steam charged with fine particles are often formed. Lava may issue from the crater or fissures on the sides of the cone.

Pelean: The extreme in explosiveness, it is named after Mt. Pelee on the Island of Martinique, West Indies, where such an eruption in 1902 destroyed the city of St. Pierre and took 30,000 lives. Its distinguishing feature is the pyroclastic flow or glowing avalanche which contains superheated gas that is so full of glowing ash and other particles it obeys the force of gravity, rushing down the slopes of mountains with hurricane force. Several have occurred in the Lassen region.

Basalts have a silicon dioxide content of less than 52 percent and are termed mafic. They are dark colored and flow readily, allowing gas to escape with ease. Andesites are intermediate in characteristics between the acid and basic lavas. These lava types react with other factors to build volcanic formations including:

Basalt Plateaus: Magma under low pressure may erupt from groups of fissures, to spread as floods of basaltic lava. The Northwest's Columbian Plateau is North America's finest example.

Shield Cones: Copious swellings of more viscous basaltic lava construct volcanoes which in profile resemble low domes or inverted saucers. Examples within the park are Prospect Peak, Mount Harkness, and Red Mountain.

Composite Cones: These are formed of alternate layers of andesitic lava flows from effusive eruptions, and fragmental material from explosive eruptions. When exposed, a banding effect is evident. Examples include the high peaks of the Cascade Range: Mount Rainier, Mount Hood, Mount Shasta, and Lassen's ancient Mount Tehama.

Plug Domes: Extremely viscous masses of silicic lava emerge rapidly en masse from a vent to form a steep-sided, bulbous mound. These may vary from tens to thousands of feet in height. Lassen Peak is considered the world's largest plug dome volcano. Others in the park are Chaos Crags, Vulcan's Castle, and Eagle and Reading Peaks.

Cinder Cones: Magma under high pressure will erupt explosively to form steep-sided volcanoes. Usually they are symmetrical in shape, and are formed rapidly. Mexico's Paricutin, for example, grew 1,000 feet by the end of the second month. Generally, cinder cones are less than 1,000 feet high. Park examples include Red Cinder Cone, Hat Mountain, and Cinder Cone.

The fragmented materials that fall from the eruptive clouds of volcanoes are known as pyroclastic products or tephra and are named according to their size, texture, and composition. Material between pea and walnut size is called lapilli. Sand-sized material is called cinders. Smaller yet are ash and dust, although frequently no distinction is made between these two. Cinders, ash, and dust may become compacted and recemented to form volcanic tuff. Material larger than lapilli which was not molten when ejected is known as block. When it is recemented with other angular rocks, it forms a rock known as breccia.

If the material was still molten when ejected so that it formed a rounded or spindle-shaped object while solidifying in the air, it is known as a bomb. If its surface is cracked so that it reminds one of the crust of a loaf of French bread, it is known as a breadcrust bomb. Bombs compacted into rock with other large round ejecta form agglomerates.

Highly vesicular, frothy, light-colored ejecta, with density often low enough to float on water, is termed pumice. Pumice is generally siliceous and acidic in composition. Highly vesicular, frothy, dark-colored ejecta, which is less siliceous, more mafic, and more dense than pumice is termed scoria.

GENERAL VOLCANOLOGY

Technically, a volcano is a vent or chimney connected to a reservoir of molten material, a magma chamber, within the earth's crust. Ejected material usually accumulates around the opening, the vent, to build a cone, or "volcanic edifice." As popularly used, the term volcano includes both the vent and accumulated materials.

Origin of Volcanoes - Basic Considerations

Temperature of the earth's crust increases with depth. Rate of increase varies with locality and depth, varying from 86° to 122°F per mile. At great depths, the rate of increase diminishes. Forty miles below the surface, the temperature probably approaches 2200°F, the point where most materials liquefy. Earthquakes, however, demonstrate the solidity of such material, which remains solid or semi-solid due to tremendous pressure of overlying rock.

Magma usually collects at various levels within the crust to displace and/or incorporate surrounding rock and form a reservoir, the feeding chamber. These pockets of molten material near the surface may be formed by:

- (1) Reduction of pressure, typically occurring in volcanic mountain belts.
- (2) Increase of temperature, usually caused by reduction of pressure, radioactive breakdown of elements such as uranium, thorium, and/or earth movements along faults in the crust.
- (3) Combination of these.

Once magma forms near the surface crust, it tends to rise, or to be forced to the surface by self-contained gases. A variety of formations may develop:

Basalt plateaus. Magma, under low pressure, may erupt forming swarms of fissures, to spread as floods of basaltic lava. The Northwest's Columbian Basalt Plateau is North America's finest example.

Shield Cones. Copious swellings of more viscous lava construct volcanoes which in profile resemble low domes or inverted saucers. Examples are Prospect Peak, Mount Harkness and Red Mountain.

Cinder Cones. Magma, under high pressure, will erupt explosively to form steep-sided volcanoes. Usually they are symmetrical in shape and are formed rapidly. Mexico's Paricutin, for example, grew 1,000 feet by the end of the second month. Generally, cinder cones are less than 1,000 feet high. Examples include Red Cinder Cone, Hat Mountain, and Cinder Cone.

Composite Cones. These are formed of alternate layers of lava flows from effusive eruptions and fragmental material from explosive eruptions. When exposed, a banding effect is evident. Examples include the high peaks of the Cascade Range: Mount Rainier, Mount Hood, Mount Shasta and ancient Mount Tehama.

Plug Domes. Extremely viscous masses of lava emerge rapidly and "en masse" from a vent to form a steep-sided, bulbous mound. These may vary from tens to thousands of feet in height. Lassen Peak is considered the world's largest plug dome volcano. Others are Chaos Crags, Mount Diller, and Reading Peak.

Materials ejected from a volcano vary in chemistry as components separate in the magma chamber. As magma cools, the first minerals to crystallize are poor in silica, but rich in iron, calcium and magnesium. As cooling progresses, minerals richer in silica and potassium develop. Heavier crystals, rich in iron, calcium and magnesium sink toward the chamber floor and leave the lighter, silica-rich residual liquid on top. Evidence suggests that eruptions may occur at any stage in the cooling and separation process, and fissures may tap any level of the feeding chamber.

A major effect of crystallization within the magma chamber is a concentration of gas within the remaining liquid. Ultimately, the gas pressure becomes too great for the reservoir roof to withstand and eruptions begin. Gas then becomes the driving force within a volcano.

Initial eruptions or explosions, whether gas, magma or a combination of the two, reduce the pressure and allow more gas to separate from liquid. In this manner, eruptions become self-sustaining.

The Product of Volcanoes

The principal gas, steam, is generally more than 95 percent of the total discharge, seldom less than 82 percent. Carbon dioxide is the second most common gas. Sulfurous gases such as sulfuric acid, H_2SO_4 , create the characteristic odor of volcanoes. However, less is released than of water and carbon dioxide. Gases released in minor amounts include hydrogen, ammonium chloride, carbon monoxide, nitrogen, chlorine, and fluorine.

Naming of Volcanic Products

Fragmented or pyroclastic products are named according to size, texture, and composition of materials. Fine-sized materials, smaller than peas, include dust and ash which, when compacted to rock, form volcanic tuff. Fragmental material between pea and walnut size is termed lapilli. Material larger than walnut size is termed block, which when compacted to rock, forms volcanic breccia.

Volcanic Bombs are almond shaped, with twisted "ropes" of lava and cooling cracks. These form as large blobs of molten or semi-solid lava which solidify while falling through the air. Bombs compacted into rock with other large, round ejecta form agglomerates.

Highly vesicular, frothy, light-colored ejecta, with density often low enough to float on water, is termed pumice. Pumice is generally siliceous and acidic in composition. Highly vesicular, frothy, dark-colored ejecta, less siliceous, basic and more dense than pumice is termed scoria.

Types of Eruptions

Hawaiian: Exemplified by basaltic shield volcanoes such as Kilauea. Extremely hot, fluid lavas pour from summit vents and also from fissures on the mountain flanks. Fragmental material is minimal, as gases are liberated quietly.

Strombolian: Named after a volcano off the coast of Sicily. Rhythmic discharges occur at intervals of seconds or minutes, ejecting pasty, glowing clots of magma (scoria) which cool to form bombs and lapilli. Eruptions are accompanied by white vapor clouds. A few solid fragments are expelled. Lava swellings are on a very small scale, usually more viscous than the Hawaiian types. A cinder cone is the characteristic form.

Vulcanian: Named for Vulcano, Italy. Explosive discharges of viscous magma are spaced by intervals of quiescence. Solid, angular fragments are ejected, together with pasty lumps of magma-bombs and frothy pumice. The final phases are characterized by gas eruptions, which may continue hundreds of years after the last magma eruption. Huge cauliflower-like clouds of steam charged with fine ash are often formed. Flows are rare, and characteristic of siliceous magmas; those that do form cool to thick, stumpy tongues of obsidian.

Ultra-vulcanian: Only rock fragments are discharged, no lava. Normally these low temperature steam blasts occur as the first outbreak of a new volcano, or as initial explosions of older volcanoes after periods of dormancy.

Pelean: Named for Mt. Pelee on the island of Martinique, West Indies. Following production of highly viscous magmas, intense explosions of superheated steam blast great amounts of glowing ash and large fragment as glowing avalanches, or nuee ardente, over wide regions. Similar eruptions occurred at Lassen Peak in 1915.

Fissure: Lavas escape from fissures, rather than from central vents. More copious flows produce no volcanoes, but rather large, level plateaus such as the Columbia River Basalts.

The nature of volcanic eruptions is determined primarily by gas pressure and viscosity of the magma, both of which are controlled by magma composition and stage of cooling. Lava viscosity varies inversely with temperature and gas content.

The lower the viscosity, the greater the tendency to swell quietly and form low-lying structures. These lavas are of basic (basaltic) composition, relatively low in silicon dioxide, about 50 percent, but relatively high in iron and calcium oxide, about 20 percent.

High gas pressure is correlated with high viscosity, which increase the tendency toward explosive activity and formation of conical structures. Generally, these lavas are more acidic (rhyolitic dacitic) in composition, relatively rich in silicon dioxide, about 70 percent, but poor in iron and calcium dioxide, about 3 percent.

The layman's term, cinders, is used to include all fragmental material between ash and block in size.

Lava is the general term for all volcanic material extruded above ground, whether liquid or solid.

Lava character is determined by chemical composition, gas content, magma temperature and environment where extruded. Surface flows of lava are usually termed pahoehoe if appearing ropey or as cordlike corrugations, and Aa if appearing rough or blocky.

Lavas are classified according to composition and textural character, such as percentage and size of gas cavities, amount of crystallization, and selective size of crystals. Composition, the primary criterion for classification, determines most characteristics of flows. Lavas relatively poor in silica and rich in calcium, iron, and magnesium, the basalts, are more fluid than lavas with the reversed composition, the rhyolites and dacites. Occasionally these move greater distance and at greater speeds, to form thin layers, than the rhyolitic or dacitic lavas, which are pasty and sluggish. Basaltic lavas are generally 1800° to 2220°F. Siliceous lavas are generally 1100° to 1550°. Andesitic lavas are intermediate in chemistry between basalt and dacite.

Pillow lavas form whenever lava flows into water and cools rapidly.

Caldera versus Crater (Hans Rick's Classification)

All calderas are related to volcanic topography. Many craters are not related to volcanic topography.

Volcanic craters are inseparably related to conduits. Calderas are not related to the roof of the reservoir.

Volcanic craters are the eruption vents. Calderas are never entirely eruption vents.

Volcanic craters are the vents through which ejecta passes. They are positive, active volcanic forms.

Calderas are the result of change in state or volume within the underlying reservoirs. They are negative, passive forms.

Volcanic craters occur during the active, growing periods of volcanoes.

Calderas are marks of decadence and age, although caldera formation may be followed by renewal of activity.

**INDIAN USES OF PLANTS FOUND IN
LASSEN VOLCANIC NATIONAL PARK**

American Dogwood / *Cornus sericea*

Tribes: Northeastern California

- | | |
|--------------|----------------------------------|
| (1) Food | Berries |
| (2) Medicine | Root and bark for cold and fever |

Angelica / *Angelica breweri*

Tribe: Maidu

- | | |
|-----------------------------|--|
| (1) Food | Greens |
| (2) Medicine | Rubbed on legs to prevent rattlesnake bite |
| (3) Music, Art and Religion | Dance ceremony |

Balsam Root / *Balsamorhiza sagittata*

Tribes: Northeastern California

- | | |
|--------------|--|
| (1) Food | Roots, young leaves and stems, seeds raw or roasted |
| (2) Medicine | Roots as tea for rheumatism and headaches, root poultice on insect bites |

Bedstraw / *Galium* spp.

Tribes: Northeastern California (1 and 2), Maidu (3)

- | | |
|-----------------------------|--------------------------|
| (1) Food | Seeds |
| (2) Medicine | Fevers and inflammations |
| (3) Music, Art and Religion | Smoked in ceremonies |

Black cottonwood / *Populus balsamifera*

Tribes: Northeastern California

- | | |
|--------------------------------|--------------------------------|
| (1) Food | Inner bark, catkins |
| (2) Medicine | Sap used on cuts |
| (3) Tools, Implements, Weapons | Gum used to waterproof baskets |

Blue Camas / *Camassia quamash*

Tribes: Atsugewi, Maidu

- | | |
|----------|---------------------------|
| (1) Food | Bulbs roasted, root eaten |
|----------|---------------------------|

**Bracken Fern / *Pteridium aquilinum*
var: *pubescens***

Tribes: Northeastern California

- | | |
|--------------------------------|--|
| (1) Food | Young shoots, rhizomes |
| (2) Medicine | Rhizome to expel worms and heal wounds and burns |
| (3) Tools, Implements, Weapons | Roots for twine, rope, and baskets |

Brodiaea / *Brodiaea* spp.

Tribes: Northeastern California

- | | |
|----------|----------------------|
| (1) Food | Bulbs raw or roasted |
|----------|----------------------|

Buckwheat / *Eriogonum* spp.

Tribes: Northeastern California

(1) Food

Seeds raw or as flour, young stems raw or cooked

(2) Medicine

Leaves for headache or stomachache

Bush Chinquapin / *Castanopsis sempervirens*

Tribes: Northeastern California

(1) Food

Nuts, raw or roasted

California Red Fir / *Abies magnifica*

Tribes: Northeastern California

(1) Food

Inner bark; needles for tea (high in Vitamin C)

Cattail / *Typha latifolia*

Tribes: Northeastern California

(1) Food

Roots, stalks, young shoots, flower spikes, pollen

(2) Shelter & Furnishings

Pollen for pillows. Leaves for mats, roofing thatch, caulking canoes and houses

(3) Medicine

Root for poultice on burns and wounds

Clovers / *Trifolium* spp.

Tribes: Northeastern California

(1) Food

Leaves, seeds

Coyote Mint / *Monardella odoratissima pallida*

Tribes: Northeastern California

(1) Food

Leaves eaten raw or as tea

(2) Medicine

Tea for colds, indigestion, and fever

Elderberry / *Sambucus* spp.

Tribes: Northeastern California

(1) Food

Berries

(2) Tools, Implements, Weapons

Smoking pipes

(3) Music, Art and Religion

Flutes made from branches

Horsetail / *Equisetum* spp.

Tribes: Northeastern California

(1) Food

Inner pulp of stalks

(2) Medicine

Stalks for kidney and bladder trouble

(3) Tools, Implements, Weapons

Stalks used to polish arrows and other woodwork

Incense Cedar / *Libocedrus colcedrus*

Tribes: Northeastern California

(1) Food

Bark

(2) Shelter & Furnishings

Bark and slabs for building material

(3) Tools, Implements, Weapons

Fire making drills

(4) Medicine

Leaves for stomach trouble

Indian Paint Brush / *Castilleja* spp.

Tribes: Northeastern California

(1) Food

Flowers, seeds

Jeffrey Pine / *Pinus jeffreyi*

Tribes: Northeastern California

(1) Shelter & Furnishings

Roots for baskets

Knotweed / *Polygonom bistortoides*

Tribes: Northeastern California

(1) Food

Roots, young leaves

(2) Medicine

Roots very strong astringent, to stop bleeding, and diarrhea

Lady Fern / *Athyrium filix-femina*

Tribes: Northeastern California

(1) Food

Rhizome, shoots roasted or baked

(2) Medicine

Root boiled to expel tapeworm

Lovage or Wild Parsley / *Ligusticum grayi*

Tribe: Atsugewi

(1) Food

Leaves

(2) Medicine

Root for colds, coughs, stomachache

(3) Tools, Implements, Weapons

Poisoning fish

Manzanita / *Arctostaphylos* spp.

Tribes: Northeastern California

(1) Food

Berries eaten raw or used in flour and cider

(2) Medicine

Leaves for cuts, burns, and poison oak rash

Milkweed / *Asclepias cordifolia*

Tribes: Northeastern California

(1) Food

Stems and leaves, flower buds, seeds and seed pods; sap for chewing

(2) Medicine

Latex from stems for cuts, sores, and ringworm. Seeds boiled for snake bite poisoning; root for toothache

(3) Tools, Implements, Weapons

Stems for rope, nets, cloth, bowstring

Monkey Flower / *Mimulus* spp.

Tribes: Northeastern California

(1) Food

Leaves and stems, source of salt

(2) Medicine

Poultice for burns and wounds

Mountain Alder / *Alnus incana*

Tribes: Northeastern California

- | | |
|--------------|--|
| (1) Food | Inner bark |
| (2) Clothing | Bark used as a dye |
| (3) Medicine | Bark used for diarrhea, stomachache, and hemorrhages |

Mountain Hemp / *Apocynum androsaemifolium*

Tribes: Northeastern California

- | | |
|--------------------------------|---------------------|
| (1) Food | Seeds |
| (2) Tools, Implements, Weapons | Cordage and netting |

Mountain Mahogany / *Cercocarpus ledifolius*

Tribes: Maidu, Atsugewi

- | | |
|--------------------------------|--|
| (1) Tools, Implements, Weapons | Sticks, splitting wedges, torches, digging sticks, fuel for sweats (low smoke) |
|--------------------------------|--|

Mountain Maple / *Acer glabrum*

Tribes: Northeastern California

- | | |
|----------|--------------------|
| (1) Food | Inner bark, shoots |
|----------|--------------------|

Mountain Strawberry / *Fragaria virginiana*

Tribes: Northeastern California

- | | |
|--------------|----------------------|
| (1) Food | Berries, young stems |
| (2) Medicine | Leaves for tea |

Mule Ears / *Wyethia mollis*

Tribes: Northeastern California

- | | |
|--------------------------------|--|
| (1) Food | Seeds, young shoots; leaves poisonous |
| (2) Medicine | Young shoots for nursing mothers |
| (3) Tools, Implements, Weapons | Fermented root used to poison arrow tips |

Ocean Spray / *Holodiscus microphyllus*

Tribes: Northeastern California

- | | |
|----------|-------|
| (1) Food | Fruit |
|----------|-------|

Ponderosa Pine / *Pinus ponderosa*

Tribes: Northeastern California

- | | |
|--------------------------------|--|
| (1) Food | Nuts and inner bark, sap chewed, needles used in tea |
| (2) Medicine | Needles chewed for heartburn |
| (3) Tools, Implements, Weapons | Roots in basket making |

Pondweed / *Potamogeton* spp.

Tribes: Northeastern California

- | | |
|----------|------------|
| (1) Food | Rootstocks |
|----------|------------|

Popcorn Flowers / Plagiobothrys spp.

Tribes: Northeastern California

(1) Food

Leaves, shoots and seeds

Quaking Aspen / Populus tremuloides

Tribes: Northeastern California

(1) Food

(2) Medicine

Inner bark and sap

Bark for diarrhea, fever. Winter buds used in tea for coughs, sore throat. Tea used as wash for cuts and burns.

Sagebrush / Artemisia spp.

Tribes: Atsugewi/Maidu

(1) Medicine

Bark mixed with deer manure for toothache.

Leaves and stems to prevent blood poisoning.

Tea from leaves for diarrhea and colds. Hair wash.

Sedge / Carex spp.

Tribes: Northeastern California

(1) Food

(2) Tools, Implements, Weapons

Roots, stalks

Roots used in basketry and ropes

Service Berry / Amelanchier utahensis

Tribes: Northeastern California

(1) Food

(2) Shelter & Furnishings

(3) Medicine

(4) Tools, Implements, Weapons

Berries

Ladders from branches

Inner bark - snow blindness

Arrow tips, rod body armor, baskets, fish harpoons

Shooting Star / Dodecathoen spp.

Tribes: Northeastern California

(1) Food

(2) Medicine

Leaves and roots

Whole plant cooked and used as poultice for swelling

Sierra Currant / Ribes nevadense

Tribes: Northeastern California

(1) Food

Berries raw, cooked or dried

Sierra Gooseberry / Ribes roezlii

Tribes: Northeastern California

(1) Food

Berries raw or cooked

Snow Bush / *Ceanothus cordulatas*

Tribes: Northeastern California

(1) Food

Berries and seeds; leaves for tea

Squaw Currant / *Ribes cereum*

Tribes: Northeastern California

(1) Food

Berries eaten raw or cooked. Dried leaves raw or steamed; flowers

(2) Medicine

Berries to relieve stomachache

(3) Tools, Implements, Weapons

Wood used for arrow shafts

Staghorn Lichen / *Letharia vulpina*

Tribes: Northeastern California

(1) Food

Whole plant edible

(2) Music, Art and Religion

Yellow dye

St. John's-Wort / *Hypericum formosum*

Tribes: Northeastern California

(1) Food

Bulb raw or ground into flour

Sugar Pine / *Pinus lambertiana*

Tribes: Northeastern California

(1) Food

Gum for chewing, nuts, inner bark

(2) Medicine

Gum for healing burns, mild laxative, ulcers, and sores

(3) Tools, Implements, Weapons

Pitch used as glue for canoes and arrows

Sword Fern / *Polystichum imbricans*

Tribes: Northeastern California

(1) Food

Rhizomes baked or roasted

(2) Tools, Implements, Weapons

Fronde used to line earth ovens

Thistle / *Cirsium* spp.

Tribe: Atsugewi

(1) Food

Young stalks eaten raw or cooked

(2) Tools, Implements, Weapons

Stalks made into cord

Tobacco / *Nicotiana* spp.

Tribes: Northeastern California

(1) Medicine

Ceremonies to heal

(2) Music, Art and Religion

Religious ceremonies

Tobacco Brush / *Ceanothus velutinus*

Tribes: Northeastern California

(1) Food

Berries

(2) Medicine

Leaves smoked as tonic

Tule / Scirpus acutus

Tribes: Maidu (1, 2, 3, 4), Atsugewi (2, 3)

- | | |
|--------------------------------|---|
| (1) Food | Roots, leaves |
| (2) Clothing | Leggings, blankets, skirts, headdresses |
| (3) Shelter & Furnishings | Mattresses, wall coverings, mats |
| (4) Tools, Implements, Weapons | Rafts, basket making |

Tule Grass / Juncus spp.

Tribes: Maidu, Atsugewi

- | | |
|--------------------------------|---|
| (1) Food | Leaves, shoots and roots |
| (2) Clothing | Woven into breech cloths, skirts, dance headdresses, shirts |
| (3) Shelter & Furnishings | Mats for doors, beds, summer shelters |
| (4) Tools, Implements, Weapons | Basket making |

Western Buttercup / Ranunculus occidentalis

Tribes: Northeastern California

- | | |
|----------|---|
| (1) Food | Raw plant poisonous; seeds and roots cooked |
|----------|---|

Western Juniper / Juniperus occidentalis

Tribes: Northeastern California

- | | |
|--------------------------------|---|
| (1) Food | Berries eaten raw or made into flour |
| (2) Clothing | Green boughs burned to smoke hides to soften; snowshoe frames |
| (3) Medicine | Berries for colds; leaves and bark for tea |
| (4) Tools, Implements, Weapons | Basket making, fire making drills |

White Fir / Abies conolor

Tribes: Northeastern California

- | | |
|---------------------------|---|
| (1) Food | Inner bark and gum |
| (2) Shelter & Furnishings | Boughs and bark used in building shelters |
| (3) Medicine | Sap used on cuts and wounds |

Wild Barley / Hordeum brachyantherum

Tribes: Northeastern California

- | | |
|----------|-------|
| (1) Food | Seeds |
|----------|-------|

Wild Caraway / Perideridia bolanderi

Tribes: Northeastern California (1, 3), Atsugewi (2)

- | | |
|--------------------------------|--------------------|
| (1) Food | Roots, seeds |
| (2) Tools, Implements, Weapons | Fish poisoning |
| (3) Music, Art and Religion | Used in ceremonies |

Wild Mint / Mentha arvensis

Tribes: Northeastern California

(1) Food

Leaves eaten raw or in soups, stews and tea

(2) Medicine

Upset stomach, sore throat, headache and diarrhea

Wild Onion / Allium spp.

Tribes: Northeastern California

(1) Food

Bulbs raw or cooked, some species leaves and stems

(2) Medicine

Bulbs for stomach gas, poultice on tumors, ulcers, and earaches. Juice for sore throats, coughs, and insect bites

Willow / Salix spp.

Tribes: Northeastern California (1, 3, 4), Maidu (1, 2, 3, 4)

(1) Food

Inner bark

(2) Clothing

Shredded inner bark for diapers, inner bark for skirts

(3) Shelter & Furnishings

Branches for sweat lodges and shelters

(4) Tools, Implements, Weapons

Baskets, tanning hides, tying, traps, and nets

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Compiled by Marilyn Cannon, Educational Consultant, February 1995

PLANTS AND ANIMALS OF LASSEN VOLCANIC NATIONAL PARK

Although Lassen is primarily known for its volcanic geology, the park boasts a rich diversity in plant and animal life. Over 700 flowering plant species grace the park, providing shelter and food for 250 vertebrates (animals with backbones) as well as a host of invertebrates including insects.

This great diversity of life forms is due to two factors--the geographic location of the park and the abundance of habitats that occur there.

Situated at the southern end of the Cascade Range geologic province, Lassen Park lies at the crossroads of three great biological provinces--the Cascades to the north, the Sierra Nevada mountains to the south and the Great Basin desert to the east.

The myriad of habitats in Lassen Park are allowed by variations in such environmental conditions as elevation (5,000 to 10,457 feet), moisture (precipitation is greater on the western than the eastern side of the park), substrate (rock type and soil depth), temperature, insolation (amount of sun) and prior disturbance (both natural and man-caused).

Habitats and their resident plants and animals can be arranged into communities named after their predominant plant species or by some other descriptive term such as climate or general vegetation type. The following survey is a brief introduction to the major communities of Lassen Park. It is important to remember that animals are mobile and thus may occur in more than one community, and also that some species are ubiquitous--that is they occur over a wide range and refuse to be categorized at all.

MIXED CONIFER FOREST (YELLOW PINE FOREST). At the lower elevations in the western part of the park (below about 6,500 feet) is a rich forest community characterized by a mix of conifers. The most common trees in this forest are Jeffrey pine, ponderosa pine, incense cedar, sugar pine, and white fir.

Common wildflowers and food plants for wildlife include gooseberries, currants, squawcarpet ceanothus, snowberry, stickseeds, Indian warrior, miner's lettuce, campion, spotted coralroot, pinedrops, pipsissiwa, snow plant, and pyrola. This rich forest is home to a host of animals including the common flicker, olive-sided flycatcher, western wood pewee, white and red-breasted nuthatch, brown creeper, Townsend's solitaire, great horned and pygmy owl, yellow-bellied sapsucker, pileated woodpecker, skunk, and a variety of rodents.

UPPER MONTANE FOREST (RED FIR FOREST). Just above the mixed conifer forest lies a forest zone containing less diversity than that found at lower elevations. Here, at elevations in the park between 6,500 and 8,000 feet, occur dense red fir forests with little understory and fewer animals.

In the more open areas western white pine is common and on thin soils occur lodgepole pine. At this elevation, winter snows lie deep and summer temperatures are cool in the dense shade of the red fir.

The upper montane forest does have its characteristic animals, although most are rather shy and secretive. Living in this forest are the Williamson sapsucker, hermit thrush, black-backed woodpecker, snowshoe hare, red fox, and pine marten.

Many animals make no distinction between the mixed conifer forest and upper montane forest, and so live happily in both. This is especially true for a number of forest dwelling birds, such as the Steller's Jay, western tanager, golden-crowned kinglet, owls (spotted, flammulated, saw-whet, and great grey), woodpeckers (hairy, downy, and white headed), solitary and warbling vireos, evening grosbeak, and dark-eyed junco. Forest mammals include the porcupine, chickaree (or Douglas' tree squirrel), northern flying squirrel, and chipmunks.

SUBALPINE. As one rises above the forest zone in Lassen Park the trees begin to take on a more gnarled character and bare patches of ground intersperse between the wooded areas. The subalpine community is a land of extremes, with shaded hollows collecting very deep drifts of snow (up to 40 feet!) while adjacent areas may remain snow free due to the fierce winter winds. The subalpine areas do contain, however, a distinctive assemblage of plants and animals that can tolerate, and often thrive, in the harsh conditions.

The subalpine community in Lassen Park (between 8,000 and 10,000 foot elevations) is the home of two distinctive and beautiful conifers, the whitebark pine and the mountain hemlock. The pine prefers the drier sites while the hemlock does well in moist shaded areas. Both trees are subject to the harsh winter weather and are often forced into a prostrate position known as krummholtz ("crooked wood").

Because of the abundance of sun and variation in moisture at this high elevation, the subalpine is host to a large number of shrubs and beautiful wildflowers, including red heather (or Brewer's mountain heath), white heather (or Merten's cassiope), rock spirea, sandwort, Sierra pincushion, spreading and prickly phlox, silky raillardella, rock cress, wallflower, Lobb's nama, coyote mint, Lyall's lupine, rock fringe, ballhead ipomopsis, eriogonums, Davis' knotweed, Indian paintbrush, and penstemons.

Because of the rich and varied flora in the subalpine community, there is also a host of birds and other animals common to the area. Most notable are Clark's nutcracker, mountain chickadee, mountain bluebird, Cassin's finch, yellow bellied marmot, and pika (or cony).

ALPINE. The alpine community is the region above the treeline that experiences intense sunlight, desiccation winds and very cold temperatures. The wind keeps many areas snow-free all year--adding to the moisture stress--while other areas may have snow patches lasting into late August or throughout the year. The alpine is often considered a desert because during most of the year water is tied up in the frozen solid state--and hence unavailable for plant life.

And yet, the alpine community manages a yearly blossoming of life during the brief summer. Many plants are adapted to the harsh conditions (mostly by forming small mats or cushions that conserve heat and moisture), and each year a small number of animals hurry to gather food for the long winter that is just around the corner.

Common plants in the alpine include pussy toes, pussy paws, golden draba, timberline phacelia, skunk-leafed polemonium, eriogonums, alpine sorrel, alpine (or Tolmei's) saxifrage, dwarf hulsea, and Davidson's penstemon.

Animals in the alpine include the gray-crowned rosy finch, Clark's nutcracker, pika, and some small rodents.

MEADOWS. The meadows, grasslands and herbaceous areas of Lassen Park can be divided into two major types: the dry meadows and the wet meadows. Wet meadows have an abundance of soil moisture throughout the growing season and are characterized by sedges and rushes. Dry meadows tend to dry up before the summer is over and are characterized by grasses and herbs.

Meadows of both types occur in a wide range of elevations and localities in Lassen Park. As such, meadow plants and animals seen in one part of the park may not necessarily occur in another.

Meadows support a rich diversity in plant life and provide food for a large number of animals. They are, in fact, the best place to watch wildlife.

Common wildflowers of Lassen's meadows include lilies, meadow rue, spirea, bog kalmia, Bigelow's sneezeweed, buttercups, senecio, gentians, blue-eyed grass, clovers, corn lily, spring beauty, alpine shooting star, marsh marigold, sticky cinquefoil, checker (or sidalcea), giant red paintbrush, monkey flowers, elephant heads, meadow penstemon, cow parsnip, angelica, and violets. Animals of Lassen's meadows include killdeer, sparrows, shrews, mole, voles, pocket gopher, badger, western toad, Belding ground squirrel, and meadow mice.

MOUNTAIN CHAPARRAL. In certain areas of Lassen Park thick brush fields of mountain chaparral cover the landscape. Chaparral can occur anywhere there are steep rocky slopes or where disturbance such as fire has upset the natural balance of the more typical forest.

Mountain chaparral is characterized by the presence of such shrubs as greenleaf manzanita, huckleberry oak, chinquapin, and two species of ceanothus (tobacco brush and snow brush). Wildflowers include Washington lily and dogbane. A large number of birds and animals live in the chaparral due to abundant food and good cover from predators. Most notable are mountain quail, fox sparrow, cottontail, deer mouse, and dusky-footed wood rat.

JEFFREY PINE/JUNIPER WOODLAND. In the eastern part of Lassen Park are large areas covered with drier, open forests characterized by the sweet smelling Jeffrey pine. This community is a transition between the mountain environment and the Great Basin desert to the east. The most notable plant species include Jeffrey pine, western juniper, rabbitbrush, sagebrush, mule ears, mountain mahogany and sulfur flower. Animals of the Jeffrey pine/juniper woodland are a mixture of many from the mixed conifer forest plus additions from the Great Basin desert such as flycatchers, black-tailed jackrabbit, and chipmunk.

RIPARIAN AREAS. Areas along stream banks have many of the same plants and animals as meadows but have larger deciduous shrubs and animals that require running water. Included in this community are Lassen Park's only native fish, rainbow trout, as well as a host of aquatic insects.

Common plants are willows, mountain alder, black cottonwood, quaking aspen, creek dogwood, columbine, fireweed, brooklime, monkshood, larkspur, and leopard lily.

Animals along the stream side include dipper (or water ouzel), hummingbirds, belted kingfisher, warblers, aplodontia (or mountain beaver), mink, salamanders, and newts. A special habitat for birds is that of lake shores where the pied-billed grebe, Canada goose, mallard, American coot, and spotted sandpiper are found.

UBIQUITOUS SPECIES. As mentioned earlier, some animals range over a number of plant communities. Mammals on the move include mule deer, black bear, coyote, red fox, golden-mantled ground squirrel, long-tailed weasel, mountain lion, bobcat, and bats.

Dwain L. Goforth, 3/84

HISTORY NOTES

LASSEN VOLCANIC NATIONAL PARK AND SURROUNDING AREA

1821: Don Louis Arguello led an exploring expedition into Northern California and passed near the Lassen region. His padres named the mountain San Jose (later renamed Lassen Peak).

1827: Mt. Shasta named Sastise after a tribe of Indians by Peter S. Ogden who may have been the first white man to pass through the Lassen region.

Jedediah Smith named Lassen "Mt. Joseph." Actually, he applied the name to the whole range of mountains from 39 to 41 degrees latitude.

1841: Wilkes map added Saint to the name and restricted it to the peak proper.

John Bidwell, Peter Lassen, Burnheim, and Indian guide discovered and named Mill Creek.

1843: October 11 - Peter Lassen filed for a land grant from the Mexican government.

1844: July 25 - Peter Lassen became a Mexican citizen.

December 26 - Lassen's land grant, Rancho Bosquejo, approved, aided by John Sutter and John Bidwell. It lay south of what is now Vina and included the mouth of Deer Creek and totaled 22,000 acres, or 5 leagues. Lassen attempted to establish Benton City on his rancho; the city was named after Senator Thomas Hart Benton, Fremont's father-in-law. He also applied the name Sister Buttes to Lassen Peak and Brokeoff Mountain.

1845: Lassen invited William B. Ide to come to his ranch and build a sawmill. Shortly later, after a misunderstanding, Ide moved north to the present site of Tehama.

1846: Captain John Charles Fremont and some of his men visited Lassen's ranch in the spring of the year.

Applegate brothers established the southern Oregon Trail.

1847: (Summer) Lassen, along with Commodore Robert F. Stockton, backtracked the newly established Oregon Trail from Goose Lake to Missouri in hopes of encouraging emigrants to settle at Benton City.

Major Pierson B. Reading was a signer of the Treaty of Cahuenga. He also served as paymaster for Fremont's battalion and was involved in the Bear Flag Revolt. In 1848, he discovered gold on Clear Creek.

June 30 - Lassen granted the land he owned north of Deer Creek to Daniel Sill who was his ranch manager.

1848: (May) The Masons of the State of Missouri issued a charter for Western Star Lodge #98 at Benton City, California (currently located at Shasta). Peter Lassen was Junior Warden.

(Fall) Lassen returned to California leading a wagon train along a route using much of the old Applegate Trail. He deeded a large share of his land to General John Wilson and Joel Palmer. Lassen had now deeded away two-thirds of his land.

January 24 - John Marshall discovered gold at Sutter's Sawmill at Coloma.

July 4 - John Bidwell discovered gold in Feather River, later brought the Arroyo Chico Rancho.

1849: Black Rock mines discovered.

J. Goldsborough Bruff arrived in California by way of the Lassen Trail. While still in the mountains, he became sick and remained there while the others in his party continued to the Sacramento Valley. They never returned for him and he nearly starved during the hard winter.

Battle Creek named after a bloody battle between Indians and trappers.

October 30 - The Masonic Lodge finally established at Benton City; the delay was probably due to the gold rush.

1850: Bruff used the name Snow Butte for Lassen Peak, a name which had been used throughout the 1840's.

(July) Peter Lassen led a party in a search for Gold Lake. By mid-August, miners reportedly took out \$100 to \$1,500 a day at Myers diggings.

January 4 - Legislature passed a bill creating Reading County.

February 18 - The above bill amended and the name changed to Shasta County. At this time, Shasta County was bounded on the north by Oregon, on the east by Nevada, on the southeast by Butte County, and on the west by Trinity County.

1851: (Spring) William Nobles, seeking gold, was with a party of men who came to Honey Lake. The party disbanded but Nobles continued eastward looking for the rumored Gold Lake; then he intersected the Oregon Trail at Black Rock Point, Nevada. Realizing that this newer, easier route to California could mean wealth to him, he returned via what is now known as the Emigrant Trail to Anderson and from there went north to Shasta.

Masonic Lodge moved to Shasta. This probably indicates that Benton City was declining by this time and that due to gold prospecting in the Trinity mountains, Shasta was on the increase.

R-32

Grover K. Godfrey made the first recorded ascent of Lassen Peak. Capt. J.W. Maxwell also reported to have climbed the peak.

Two prospectors arrived at Georgetown, El Dorado County, and reported passing an active volcano which apparently was Cinder Cone.

Peter Lassen and Burton built the first log cabin at Indian Valley, 4.5 miles east of present Greenville. Here they raised vegetables which they sold to gold miners. The site of the cabin is now marked by California Historical marker #184.

1852: A license was granted to D.D. Harrill and Co. to operate a ferry across the Sacramento River at the mouth of Cow Creek. It is now known as Emigrant Ferry (there is a memorial on the highway 2 miles north of Anderson). Harrill was also one of the men from Shasta who went with Nobles to verify his route.

May 3 - William Nobles obtained a \$2,000 subscription from the citizens of Shasta in return for his promise to reveal his new route. He then returned to Humboldt River (Nevada) to divert emigrants to Shasta.

1853: Nobles moved to Minnesota to continue a campaign to interest people in his route.

Maj. Reading led a party that surveyed the Nobles Pass as a possible railroad route.

John H. Drebelbis traveled Nobles route and wrote about it for Hutchings California magazine, June 1857.

1854: Plumas County created by legislators.

(June or July) Isaac Roop opened a trading post at Roopstown, later called Susanville.

The Minnesota legislature sent Nobles to Congress to make a speech about his route. Congress passed a bill for \$300,000 to improve the route.

1855: Lassen moved to Honey Lake where he and Isaac Roop worked together to promote that community (now Susanville).

1856: Tehama County formed from the southern portion of Colusa County.

April 26 - A gathering of approximately 20 settlers met and drew up a paper setting up laws and regulations for a new territory to be called Nataqua. Isaac Roop and Peter Lassen were chosen recorder and surveyor respectively.

August 19 - The Wood and Long train arrived at Honey Lake under the leadership of General Allen Wood.

1857: April 28 - Legislature passed an act to provide for a wagon road from Oroville to Honey Lake. The assumption was that when a transcontinental railroad was built, it would go to Fort Reading and they hoped to turn it in their direction. The measure was defeated in

Black Butte and Plumas Counties. Perhaps the Central Pacific would have used Nobles Trail eastward if the act had passed.

August 4 - Honey Lake's independence challenged by action of Plumas County Board of Supervisors.

August 8 - A large convention held by settlers west of the Sierras. They desired that a new territory be created between California and Utah. Isaac Roop was elected one of the convention's four vice presidents; later elected territorial governor.

1858: January 5 - J. Williams, Peter Lassen and Isaac Roop acted as sub-agents of the superintendent of Indian Affairs for California. J.T. Henly signed a treaty with Winnemucca, Chief of the Paiutes.

1859: Local Indians rounded up by militia and taken to Round Valley Indian Reservation (By 1963 most of them had left the reservation because of poor conditions. In 1868 many of them were rounded up and returned to the reservation once again.)

April 26 - Peter Lassen was killed by an unknown party near what is now Clapper Creek. He was with two other men at the time, Clapper and Wyatt. Clapper was also killed.

1860: Charles F. Hoffman served as Topographer for the Whitney Survey until 1874.

Edward R. Drake settled in Warner Valley.

Peter C. Crumbaugh came to Red Bluff and grazed sheep in the vicinity of Crumbaugh Lake.

During the 1860s, James M. King lived in Kings Creek Meadows area running horses and mules. He also operated a race track in Sacramento Valley at Pine Grove.

1861: February 11 - F.W. Lander, appointed superintendent of an expedition to map Fort Kerney south pass and Honey Lake Wagon Road as a possible national military route, submitted his report.

1862: Idaho mining excitement broke out, leading to the legislative act of April 14, 1863 granting a franchise to John Bidwell et. al who established the Chico and Humboldt Wagon Road Company from Chico to Susanville.

1863: The C. Brewster-Clarence King party climbed Lassen Peak. In their writing they referred to statements having been made that steam was observed coming from the Chaos Crags between 1854 to 1857.

1864: Lassen County was created.

Major Reading and K.V. Bumpass filed a claim at "Bumpass Hell." Reading also led the third

recorded party to ascend Lassen Peak. This party included Helen Tanner Brodt, the first woman to climb Lassen Peak, and her husband Aurelius.

1865: The first reference to the geology of the Lassen region is contained in Whitney's Survey Memoir. The party included W.H. Brewster, C.F. Hoffman, and Clarence King. This party first recognized what is now known as Mt. Tehama's crater.

K.V. Bumpass burned at Bumpass Hell.

T.M. Boardman made arrangements for developing the sulphur and clay potential of the "Sulphur Works" area under the supervision of Dr. Supan, a well known chemist. They bought the area from Simmons in 1866.

April 3 - Pierce and Francis, backed by General Bidwell, started a weekly saddle train from Chico to Idaho at a cost of \$66 per trip. There were 40 passengers in the first train.

July 11 - First stage from Chico to Ruby City passed through Susanville. Black Rock Mines rediscovered about this time.

1866: July 1 (midnight) The first stage of the California and Idaho stage and Fast Freight Company left Chico, arriving in Ruby City 5 days and 3 hours later, a distance of 423 miles. The capital stock of this company was \$200,000; John Millen was the company's president.

August 22 - Yana Indians raided the Dersch place on Bear Creek and killed Mrs. Anna Maria Dersch, wife of George who had settled the place in 1861.

1867: John T. Edwards registered at Shingletown. In 1871 he moved to Santa Barbara. In 1885 he returned to Manton where he operated teams for the Klotz mill and pulled teeth for early settlers.

1871: What was believed to be the last Yahi Indians were killed at Kingley Cave.

1874: H.W. Harkness, a president of the California Academy of Sciences, described a visit to Cinder Cone in which he verified the activity reported in the winter of 1850-51.

Benjamin F. Loomis came to Viola at the age of 18. He became a hotelman, lumberman, amateur naturalist and photographer. He and his wife Estella played an important role in the establishment of Lassen Volcanic National Park.

The Tom Malgin family bought a 400 acre sheep ranch in the Drakesbad area. By 1881, they had developed open log conduits and a log bath house which became well known throughout the state.

1875: Jim Payne settled on Antelope Creek.

1878: Lt. S.E. Tillman climbed Lassen Peak; he surveyed a large area including Oroville, Quincy, and the Lassen region for the Corps of Engineers.

1883: Professor J.S. Diller first visited the Lassen region and started a series of studies of the area that extended for 40 years.

(April) William H. Coffey homesteaded 40 acres which he sold to Francis Harris on August 2, 1902. (The Herbert Kraft Company Bank in Red Bluff sold this property to W.B. Armstrong on April 5, 1904, and he in turn sold to B.F. Loomis on January 6, 1926 for \$1,000. Loomis later donated the land to the U.S. Government.) Coffey and John E. Stockton had formed a partnership in the early 1880s and posted a claim to water rights from Little Manzanita (Reflection) Lake in 1883.

1884: Fred Dersch established a sheep ranch on Hat Creek near Raker Peak and built a cabin and corral in Dersch Meadows. He was killed by Indians at his ranch on Bear Creek which lay outside what is now the park boundary.

1887: (October and December) William Bartels filed claims to water rights from Manzanita Lake.

1890: Brokeoff Meadows patented by Jeff and John Ogburn. It was known for many years as Hollensworth Flat.

1893: It is guessed that Mrs. Selena LaMarr, Indian of the Atsugewi tribe, was born in this year.

Jessen Meadows was sold by Wilson to Andres Jessen and Nelson Stewart who used it for a summer cow camp. It later became a part of the Devastated Area.

1897: Clark and Hillebrand published 48 analyses of volcanic rocks from the Lassen area.

Anklin Meadows, which was homesteaded by Richard Anklin, was sold to W.W. Elmore. It was destroyed by the Great Mudflow of May 19, 1915.

1900: Chief Shavehead, the last chief of the Hat Creek Indians, died.

Drakesbad was named by Alex Sifford when he bought the property from Edward R. Drake.

1902: (April and June) Joseph A. Rossi filed claims to water rights from Lost Creek.

1904:(June) Albert W. Smith homesteaded 160 acres near Manzanita Lake. On November 15, 1906 he sold this and adjacent 120 acres to H.H. Noble, who in turn sold these properties to the Northern California Power Company. PG&E, who took over the power company, sold this land to the Federal Government on February 26, 1931 for \$15,000, half of its assessed valuation.

1905: June 2 - Lassen National Forest established.

1907: May 6 - President T.R. Roosevelt signed proclamation establishing Cinder Cone and

Lassen Peak National Monuments.

October 30 - Badger Flat, also previously known as Pine Meadows and Booker Flat (after John R. Booker of Redding), was patented by Horace Herbert. It was sold to Hugh Addington in 1946 and purchased by the Federal Government in 1948.

1911: August 29 - Ishi, the last of the Yahi Indians, captured at slaughterhouse near Oroville.

September 4 - Ishi was taken by Professor Waterman to the University of California where he lived for 5 years.

1912: The Northern California Power Company built a small earth dam which raised the water level of Manzanita Lake a few feet.

1913: (Spring) A Forest Service lookout was built on top of Lassen Peak.

1914: May 30 - First eruption from Lassen Peak, witnessed by Bert McKenzie of Chester.

May 31 - Forest Ranger Harvey Abbey became the first person to climb the peak after the eruption.

June 9 - G.R. Milford took the first published pictures of the eruption.

June 14 - Lance Graham struck by a rock from the volcano and left for dead on the mountain. He was later rescued.

June 23 - Professor J.S. Diller returned to Lassen Peak to study new eruptions and climb to the top of the peak. He returned on July 15.

October 12 - The fire lookout completely demolished by eruption.

1915: May 19 - True lava issued from Lassen Peak, resulting in a mudflow.

May 22 - The Great Hot Blast and a second mudflow occurred. Professor R.S. Holway, U.C. Berkeley, was the first man to reach the crater after the eruption of May 19 and 22.

June 2 - The name Lassen Peak officially adopted.

1916: August 9 - The John Raker bill establishing Lassen Volcanic as the 13th national park was signed by President Wilson.

1925: A.L. Day and E.T. Allen published The Volcanic Activity and Hot Springs of Lassen Peak, summarizing most of the numerous geological studies done in the park from 1915 to 1925.

A road was built from Manzanita Lake up Manzanita Creek to Crescent Cliffs.

1926: (February) L. Walker Collins became first park superintendent and served until July 20, 1935. Prior to this date Lassen Volcanic National Park was administered by Yosemite National Park.

The Warner Valley Ranger Station was the first building constructed by the Park Service. Snow damaged it during the following winter and it was rebuilt in 1927.

A volcano observatory was established by the USGS at Mineral on the SW slope of Lassen Peak under the direction of R.H. Finch.

1927: Dr. Howel Williams started his geological research in the park.

April 30 - Exclusive jurisdiction of the park ceded by California legislature to the Federal Government. Summit Lake Ranger Station built in this year.

July 4 - B.F. Loomis dedicated the Mae Loomis Memorial Museum which he built in memory of his daughter who died January 13, 1920 from influenza.

1928: R.H. Finch and C.A. Anderson restudied the Cinder Cone and vicinity.

March 27 - Congressional act provided for the naming of a peak for John E. Raker.

April 26 - The land near Mineral on which the headquarters area is located was added to the park.

May 21 - A Congressional act allowed the Federal Government to exchange lands with the state.

1929: January 19 - A Congressional act provided for enlarging the boundaries of the park. The southern link of the Park Road to the base of Lassen Peak completed.

B.F. Loomis donated Loomis Museum and 40 acres of land to the Federal Government.

(September) Old trail from Sulphur Works to base of Lassen Peak via Lake Helen completed.

1930: April 19 - A Congressional act adjusted the boundary of the park in Section 30 T30N R5E.

August 11 - Work started on Lassen Peak trail.

August 13 - PG&E granted the Federal Government a 100 foot wide right of way in Section 18 T31N R4E.

1931: Lassen Park Road completed; Raker Memorial built.

January 26 - A Congressional act prohibited any new acquisition of property or rights of way, etc., in the park.

July 1 - Entrance fees were collected for the first time.

July 18 - Sierra Club register installed on Lassen Peak.

1932: Lake Helen snow cabin completed.

1933: Bronze plaque commemorating Helen Tanner Brodt placed at Lake Helen Picnic Area.

1935: Mt. Tehama named by Dr. J. Volney Lewis. It was previously called Brokeoff Cone and Brokeoff Volcano by Dr. Howel Williams, U.C., 1932.

115,000 silver salmon planted in Juniper Lake.

Bumpass Hell Trail completed.

(July) Ten cabins were built by the Lassen Park Company.

(August) The lecture platform at the Manzanita Lake campfire circle was completed and the lodge dining room opened to the public.

1938: (November) Seismograph station at Mineral completed.

1948: August 24 - Mt. Conard named in honor of Arthur L. Conard, organizer and president of Lassen Park Development Association, who worked hard for the establishment of the park. (The mountain was previously known as Black Butte.)

1951: Mrs. Selena LaMarr started participating in the Indian Lore Program presented during the summer months in the park.

1952: (November) Sulphur Works area added to the park.

1961: August 10 - Section 19 T31N R4E and other parcels of land in Sections 4 and 11 added to the park.

1962: October 11 - A strong storm caused a large number of the park's large trees to be blown down.

1966: The Lassen Chalet, Sulphur Works Campground, and the Southwest Entrance Station completed.

1972: April 11 - PL 92-272 transferred 482 acres to Lassen National Forest in T31N R5E W 1/2 Section 1 and NW 1/4 Section 12.

October 19 - PL 92-510 established 78,982 acres of the park as wilderness.

December 12 - Red Mountain T30N R5E, Section 34 renamed Sifford Mountain for Alex Sifford.

1973: (Summer) Lake Helen Snow Survey cabin torn down.

1974: April 26 - Manzanita Lake area declared a hazard zone and all facilities (concessioner, campground and employee housing) closed. Temporary employee and visitor use facilities relocated in Section 13.

1975: April 11 - Loomis Museum entered in the National Register of Historic Places.

November 10 - A 24 mile portion of the Nobles' Emigrant Trail within the park has been placed on the National Register of Historic Places.

1976: (May) Loops C, D, E, and F of the Manzanita Lake Campground were reopened for visitor use.

December 16 - National Park Service in cooperation with USGS increased the monitoring capabilities of the volcanic features. Installation of five seismometers, two tiltmeters and two inclinometers.

1977: (August) Public meetings on final draft of the General Management Plan were held first week in August. These meetings were held to provide for wide citizen participation through which the National Park Service would receive ideas and suggestions from the public to use in formation of the park's General Management Plan.

1978: Entered on National Register of Historic Places: March 30 - Prospect Peak Fire Lookout, May 5 - Horseshoe Lake Ranger Station, and October 3 - Administration Building at Park Headquarters

1981: (January) The General Management Plan was approved.

1982: (Summer) The chairlift was installed at the Lassen Park Ski Area.

1989: Amendment to the General Management Plan designating certain areas of Manzanita Lake to be reopened for day use.

1993: Last year Lassen Park Ski Area operated. Ski lifts removed in August.

September 17 - Loomis Museum opened to the public as the primary contact facility.

PIONEER TOYS

Make a willow whistle

Pioneer children liked to play with toys as much as today's children, but their toys had to be made by hand. One of the toys they enjoyed was the willow whistle.

Directions for making a willow whistle follow. The help of a parent or older brother or sister who can safely use a penknife may be needed. It can be tricky, so don't give up if it doesn't work the first time.

Materials:

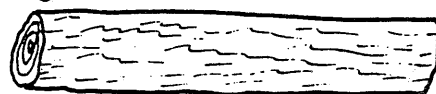
Willow branch, one-half inch in diameter

Penknife

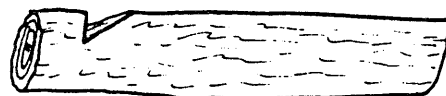
Directions:

1. Cut a three inch length of willow, cutting between buds or leaves.
2. Loosen the bark from the twig by rolling it on a hard surface, or by bending it in different directions. Be careful not to split the bark.
3. Cut a notch in the twig, about one inch from the end. The notch depth should be one-third the thickness of the twig.
4. Slide the bark "tube" off the twig, without tearing the bark.
5. Take the "barkless" part and hold it with the notch facing upwards. At the notched end, trim a small flat sliver off the top. (The flat surface should be no deeper than half the depth of the notch.)
6. Replace the bark tube, line up the notches, and try your whistle! Blow into the notch end of the whistle. If it doesn't work, try making the notch deeper, or trim a bit more from the flat surface.

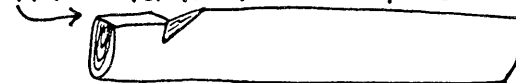
willow twig



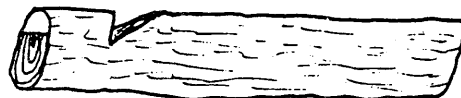
cut away notch



slide off bark "tube"
trim flat sliver from barkless piece



replace bark tube
line up notches



hollow bark tube



try your whistle!

Note: Look for willows near lakes and streams. They have long, narrow leaves that turn yellow in September.

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Make a corn husk doll

Corn husk dolls were a favorite toy of pioneer children. Try making one of these old-fashioned toys, using the instructions below. If you can't get fresh corn husks, dried husks can be purchased at a grocery store. Read through all the directions before getting started.

Materials:

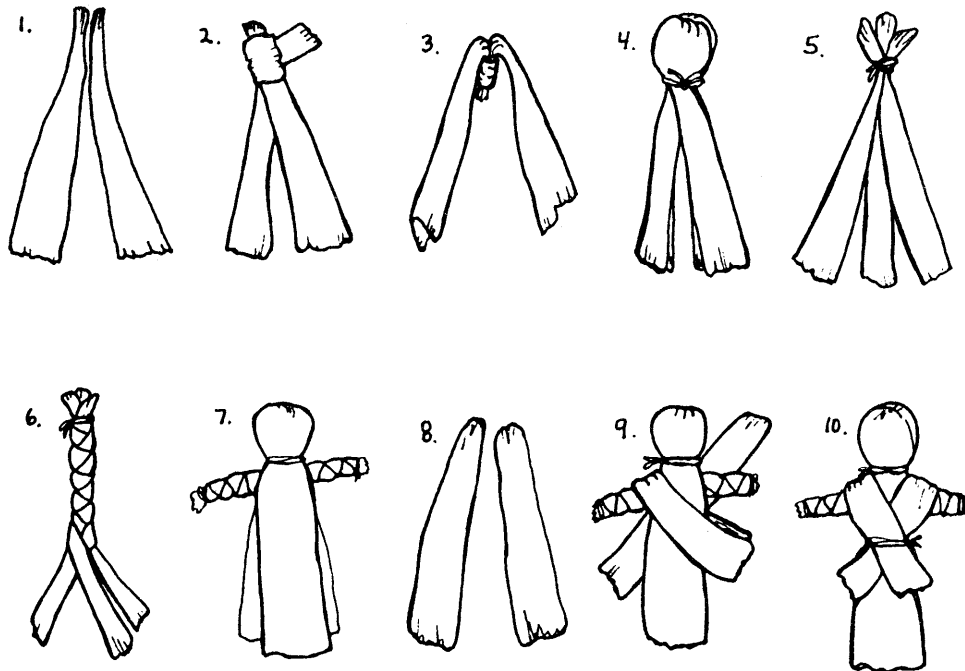
Five corn husks, soaked in warm water for a few minutes

Scissors

Colored yarn

Directions:

1. Pinch together the ends of two husks.
2. Wrap another husk around the ends, making a big lump.
3. Fold the first two husks down over the lumpy one.
4. Tie yarn around the lump and outer husks to shape the head.
5. Split another husk into three strips, then tie together at one end with yarn.
6. Braid together, then tie off another end.
7. Slide the braid between the first husks, to make the arms.
8. Split the last husk into two strips.
9. Fold one strip over each shoulder for the shirt.
10. Tie a yarn belt around the doll's waist. With paint or markers, add a nose, eyes, and mouth if you wish.



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