

Thank you for participating in this field exploration at Petrified Forest National Park! We hope you learned not only how to conduct a scientific study but that you learned something new about *your* national park.

The mission statement of Petrified Forest National Park:

Petrified Forest National Park preserves, protects, and interprets a globally significant example of a Late Triassic ecosystem and a continuum of human use in a high desert/short grass prairie environment. It preserves wilderness values for recreation, solitude, natural quiet, long distance views, and night skies. It provides outstanding opportunities for scientific research and education.

The mission statement of the National Park Service:

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The park service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

ROCKIN' THROUGH THE AGES: FROM FOSSILS TO PETROGLYPHS SUBSISTENCE LIFESTYLE STUDY

FIELD GUIDE

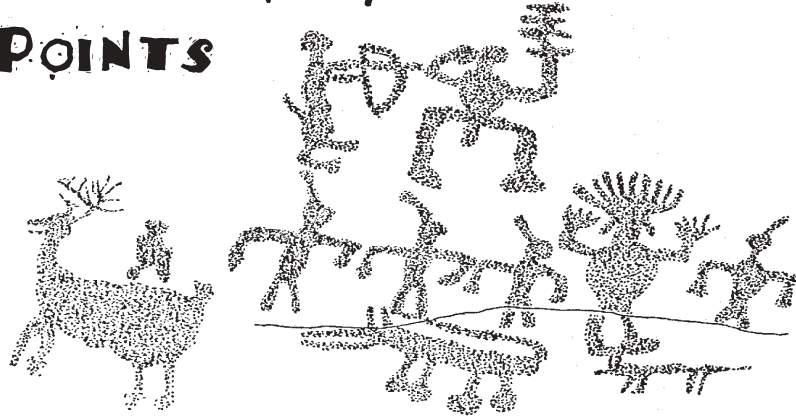
Date _____

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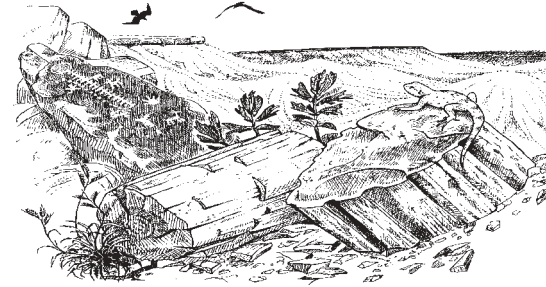
Petrified Forest National Park



RULES, REGULATIONS, AND SAFETY POINTS



- All natural and cultural resources within national parks are protected by federal law. **Collection of park resources is illegal and subject to a \$275.00 minimum fine.** This includes petrified wood, archeological artifacts, rocks, plants, and animals. Even the smallest piece counts!
- Watch your step. The plants in this environment grow by the inch and are destroyed by the foot. Don't let it be your foot!
- Do not climb, sit, or stand on pueblo walls. These walls are hundreds of years old. They are fragile and can fall down easily.
- Do not touch petroglyphs and pictographs. Oils from human skin can damage them.
- Do not draw, scratch, or paint on rock surfaces.
- Do not move artifacts. You can pick something up to look at it closer, but then put it back where you found it.
- Wear your yellow vest so other visitors know you are doing a scientific study.



SUMMARY

The archeology of Petrified Forest National Park tells us how humans lived in this difficult environment. People have been coming here for thousands of years to collect petrified wood for tools, to hunt and gather wild foods and medicines, grow crops, and for ceremonial reasons. Most archeological sites are found on the grasslands and mesas of the lower Puerco River where soils were best for the native plants and wildlife, as well as for growing crops. These resources were important for the survival of the people.

Good farming depends on the soil mixture, pH, moisture, temperature, and the length of the growing season. Soil is made of air, water, dead plant and animal material, and *sediments* (dirt, or tiny broken pieces of rock). The size of the particles in the mix determines how well the soil holds water and how quickly it is washed away. Most plants grow in a narrow pH range, between 6.8 and 9.6. Higher or lower pH levels stop some plants from getting nutrients from the soil. Annual precipitation in this area is less than 4 cm (10 inches) and the growing season is about 180 frost free days. These factors are just enough to grow crops such as corn, beans, and squash - staples of the prehistoric diet.

Because the past can never be recreated, archeological resources, including plants and animals, are in need of protection. While studying archeology, you are studying *people* who lived in a different time and place, as well as *culture* (way of life). Why do we study the life of humans who lived in the past? One reason is that understanding how people lived before us gives us perspective, appreciation, and respect for the development and differences of modern cultures. Our knowledge of the past helps us realize how the present came to be and helps to guide our future.

ADDITIONAL FIELD NOTES

Use this space for any additional notes, poems, drawings, thoughts, or feelings you have about today.



FIELD EXPLORATION GOALS

During this field exploration you will:

- learn about the science of archeology, specifically the uses of native animals, plants, and soils by prehistoric people;
- develop scientific research skills;
- develop mapping and measuring skills; and
- learn about the National Park Service and how archeological resources are protected.

MATERIALS NEEDED

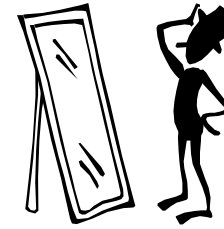
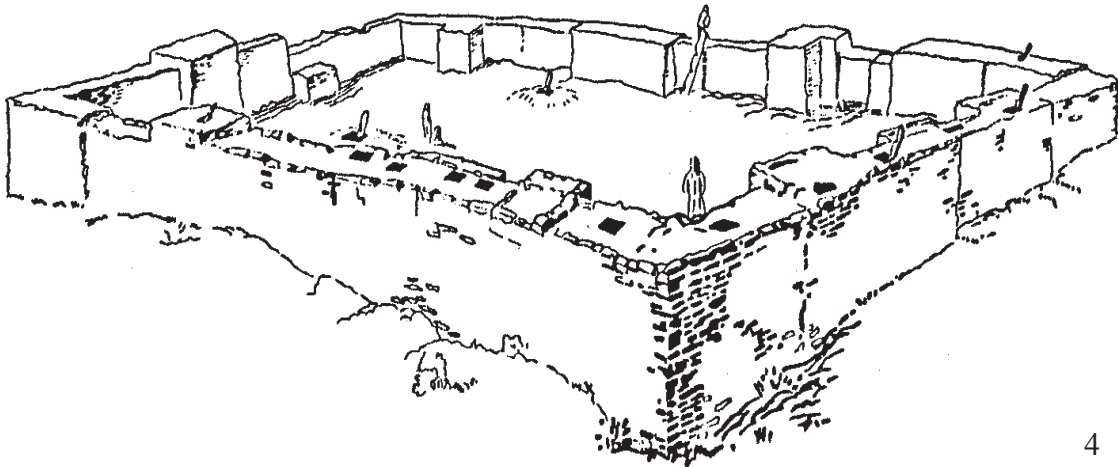
- | | |
|-------------------------|-------------------------|
| • field guide | • soil sieves |
| • pencil | • measuring cup |
| • compass | • trowel |
| • metric measuring tape | • flags |
| • graph paper | • flagging tape |
| • magnifying lens | • identification charts |
| • pH test kits | • scale |
| • clipboard | • yellow vests |



INTRODUCTION

In this field exploration you will conduct a survey of wild plants and animals in the area around Puerco Pueblo and list their possible uses by the native people. You will measure out a small area, map its contents and features, and then remove a soil sample. Using the sample, you will study the soil composition and sediment size to determine the soil type, and then you will test the pH. Finally, you will develop an *hypothesis* (educated guess) on the suitability of the land for hunting, gathering, and farming within a subsistence lifestyle.

A subsistence lifestyle at Puerco Pueblo included hunting, gathering, and farming. Hunting and gathering depended on seasons, where plants grew, and the places where animals lived. Many wild plants good for eating were available from early spring to late fall. Plants were used for more than food. They were also used for medicine, clothing, housing, tools, and in ceremonies. Animals were an important source of protein in the diet of prehistoric people, but also provided bone, hides, and sinew for tools, clothing, housing, ornamentation, and ceremonies.



REFLECTIONS

What is the most important thing you learned today?

Why do you think Puerco Pueblo is here?

Why do you think the land around Puerco Pueblo should be protected, too?

What makes it hard for the National Park Service to protect this and other archeological sites?

Soil Observations

Moisture	Texture	Describe the color	Describe the smell
_____ dry	_____ soft	_____	_____
_____ damp	_____ slippery	_____	_____
_____ wet	_____ gritty	_____	_____

Soil Type _____ Amount (grams) _____

GRAVEL

organic material

SAND

SILT

CLAY

What are the total grams of the sample you took?

_____ grams

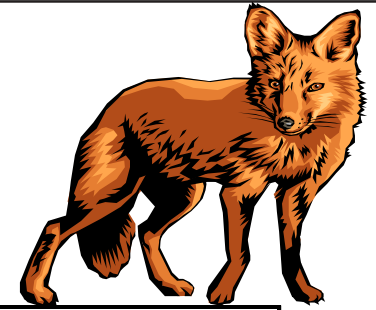
pH _____ pH of soil _____

very acidic	1	
neutral	7	
very alkaline	14	

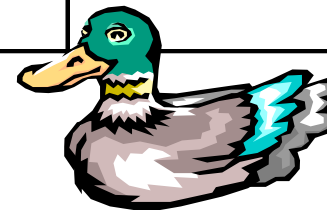
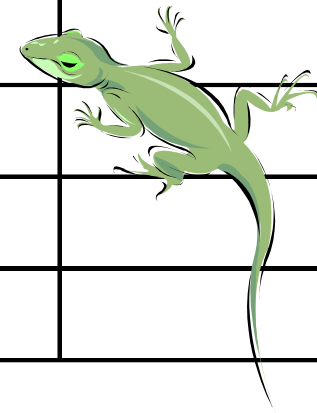
Mark in the empty box the pH measured and where it would fall on the pH scale.

CONCLUSIONS Write down your *hypothesis* (educated guess) about the suitability of the area you studied for hunting, gathering, and farming within a subsistence lifestyle.

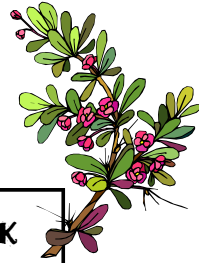
HUNTING CHECKLIST



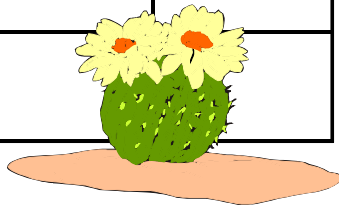
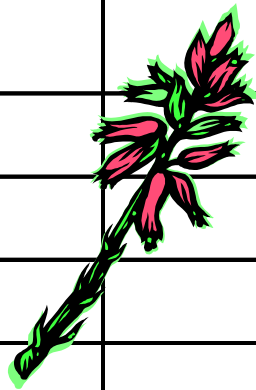
MAMMALS	BIRDS MIGRATORY OR RESIDENTS	REPTILES
Pronghorn	Geese and Ducks	Snakes
Desert Cottontail	Eagles and Hawks	Lizards
Jackrabbits	Quail	
Coyote	Ravens	
Prairie Dog		
Kangaroo Rats		
Porcupines		
Mule Deer		



GATHERING CHECKLIST



GREENS	SEEDS	FRUIT	NUTS	BARK
Rabbitbrush	Indian Millet (Rice Grass)	Yucca	Pinyon Pine	Cliffrose
Snakeweed	Saltbush	Prickly Pear Cactus		Cottonwood
Pigweed	Mormon Tea	Skunk Bush		Rabbitbrush
Saltbush	Lamb's Quarters	Tomatillo		Mormon Tea
Wild Onion	Pigweed	Wild Currant		
Rocky Mountain Bee Plant				
Wild Currant				
Yucca				
Mormon Tea				
Lamb's Quarters				



FIELD REPORT

INTRODUCTION Why did you do this scientific study?

OBSERVATIONS Describe the area around Puerco Pueblo.

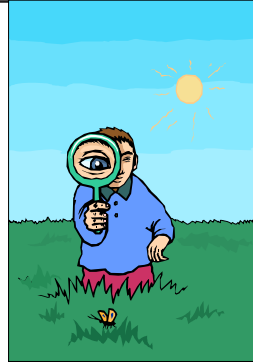
METHODS How did you do this scientific study?

DATA Complete the table below with the animals and plants you found. How do you think people used them? Use page 14 if you need more room to write.

ANIMAL	PLANT	USES BY PEOPLE

OBSERVATIONS

Scientists write field observations before beginning work. This records *variables* (things that can change) that might change the results of a study.



How do you feel today?

Describe the weather today. Is it hot, cold, windy, cloudy, sunny?

Look around you at the environment. What do you see? Rocks, sand, plants, animals or signs of animals like burrows or tracks?

DEFINITIONS

acidic - turns litmus paper red with a pH less than 7, forms salts, and has a sour taste

alkaline - (**basic**) turns litmus paper blue with a pH greater than 7, feels slippery, and has a bitter taste

alluvial - sediments left by moving water, such as in a river, flood plain, or delta

ancestral Puebloan people - a term given to people living in the Four Corners region of the Southwest from about 1,200-600 years ago; formerly called "Anasazi"

clay - fine-grained material, slippery when wet, widely used for bricks, tiles, and pottery; particles are so small they cannot be seen without a powerful microscope

loam - soil type made of sand, clay, silt, and organic matter; contains nutrients, holds moisture, and resists erosion, making it good for growing soil

pH - a measure of acidity or alkalinity; 7 is neutral, acids are less than 7, and bases are greater than 7

sand - loose, granular, gritty particles of worn or disintegrated rock, finer than gravel, commonly composed of silica; particles are large enough to see without a magnifying lens

sediment - material suspended in water or air that eventually settles out, usually in layers

silt - very small mineral particles intermediate in size between sand and clay; particles are usually too small to be seen without a microscope

subsistence - how people survive by growing crops or raising livestock, eating them or selling them only to survive rather than for profit

FIELD EXPLORATION PROCEDURES



1. Meet a park ranger at Puerco Pueblo.
2. Listen to the park ranger's introduction and review of your field guide.
3. Divide into your groups and collect the materials provided.
4. Follow the park ranger down to the study site.
5. **Answer the Observations questions on page 9.**
6. Go to the area assigned by the park ranger for your group.
7. **Look for animals and wild plants (or evidence of them) which may have been used by the people of Puerco Pueblo.** Use pages 5 and 6 and the reference material provided. **Complete the table on page 11.**
8. **Measure out a 2 meter x 2 meter plot.** Use flags to mark the corners. Mark the sides of the square with flagging tape wrapped from flag to flag all the way around.
9. **Write the date and the names of everyone in your group on your graph paper.**
10. Using the compass **find where north is at your plot.** Mark north, south, east, and west on your graph paper.
11. To **draw the plot onto your graph paper, determine the scale first.** Count the squares across the graph paper. How many squares do you need to map the length and width of the plot? Write down the scale you used onto the map, for example 1 square = 20 centimeters.

12. **Map the location of plants, rocks, and anything else within the plot.** Label what you can identify using the flip charts provided. You may want to create a legend for your map.
13. **Label the location on your map where you will take out a soil sample.**
14. **Remove a cup of soil** from within your plot. **Complete the Soil Observations section on page 12.**
15. **Pour the soil sample into the set of sieves.** Make sure the sieves are put together properly - largest screen down to the smallest screen. Gently shake it to separate the sediments by size.
16. **Separate the soil sieve into its parts,** being careful not to spill any of the contents. **Examine each sediment type with a magnifying lens.**
17. **Measure the amount of each type of sediment by weighing each sample on the scale. Complete the Soil Type section on page 12.**
18. **Test the pH of the soil** using the provided pH test kits. **Complete the pH section on page 12.**
19. **Complete the Field Report on pages 11 and 12.** Ask the park ranger if you have any questions.
20. **Present your results** to the rest of the class.
21. **Complete the Reflections questions on page 13.**
22. Use the results from this field study to develop a final project to be presented at school.