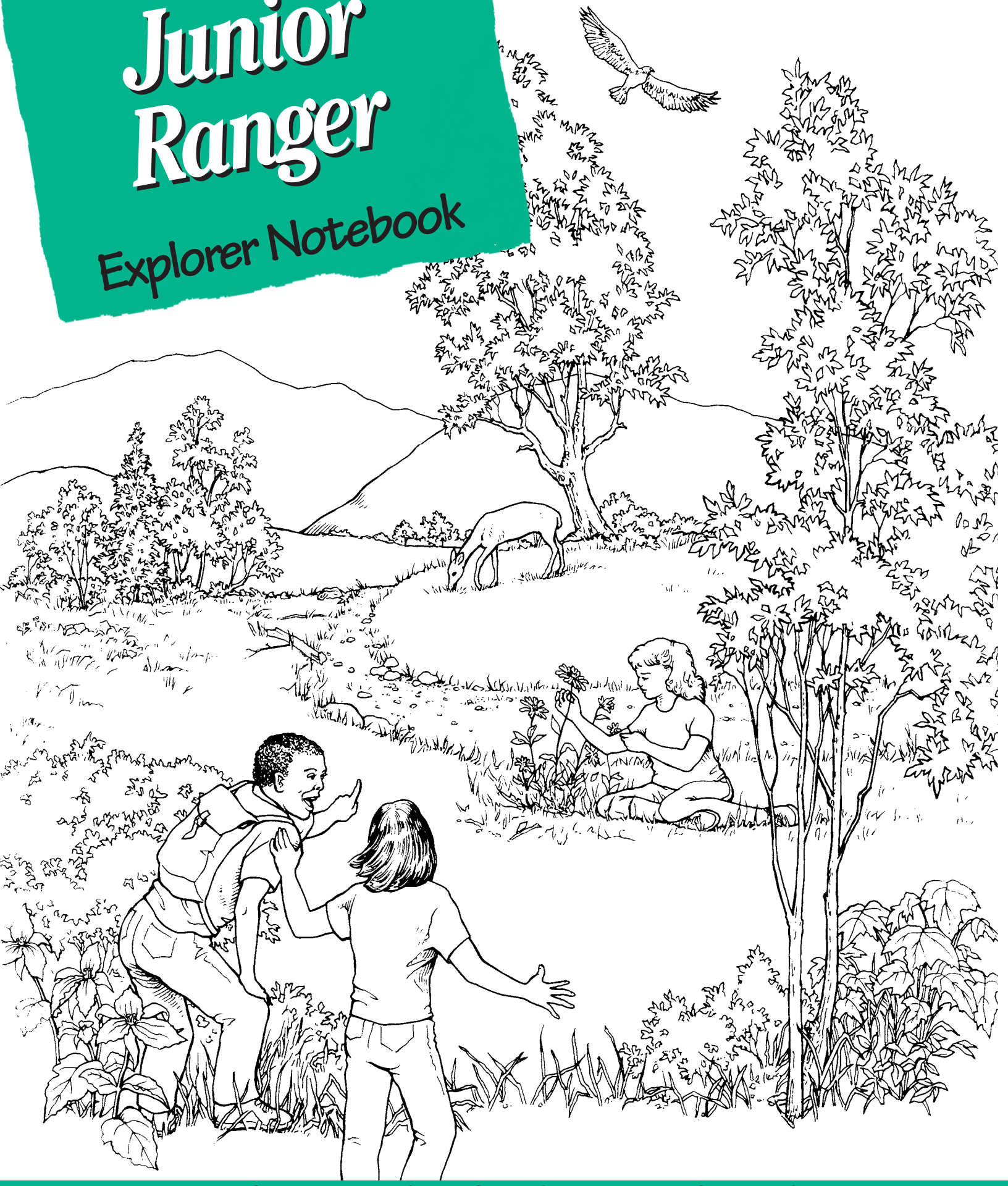
Junior Ranger

Explorer Notebook



Shenandoah National Park

Welcome to Shenandoah National Park!

Shenandoah National Park is an amazing place! In the forest here you can find talking birds, pole-vaulting insects, and rock-eating plants! Do you know that one of the world's fastest animal lives here? Do you know what animal travels all the way from Mexico to visit Shenandoah?

If you would like to learn more about these things and explore Shenandoah National Park, you may be interested in becoming a Junior Ranger. Junior Rangers are special people who help protect national parks by learning about them. It takes hard work to become a Junior Ranger, but it is fun! If you are interested...read on!

How to become a Junior Ranger

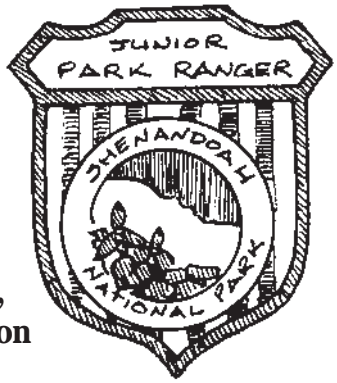
If you are 7 years of age or older, here is what you need to do to become a Junior Ranger.

Stage 1.

Complete 5 of the 15 activities in this book. Show your work to a ranger and receive a "Shenandoah Explorer" sticker.

Stage 2.

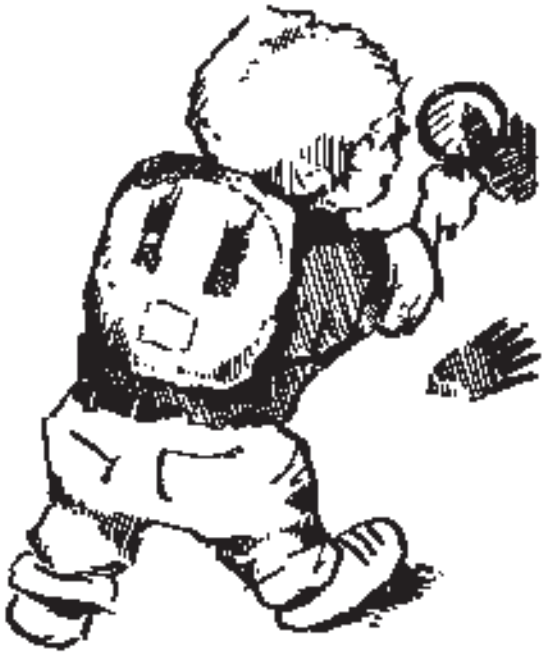
After completing Stage 1, finish 7 more activities in this book for a total of 12 and attend 2 ranger-led programs. Have the ranger sign your book after each program. When you have done all this, show your book to a ranger at Dickey Ridge Visitor enter, Byrd Visitor Center, or Loft Mountain Information Center and have your work checked. You will then be a Junior Ranger and can choose a patch or badge to display as you please!



Congratulations on your decision to become a *Junior Ranger!* To learn about this Park, you will have to explore it closely. This book will help you do that.

Each activity in this book has an *Explorer Notebook* at the bottom of the page. This notebook will direct your exploration and help you discover exciting things about the Park. Good explorers always record what they see by writing or drawing pictures. Use the Explorer Notebook to record what you observe in Shenandoah National Park.

Remember that all things in the Park are protected. While you explore, be careful to leave things as you find them so that others may enjoy what you have seen.



Explorer Notebook

Have fun as you explore! Record the following information before you begin the program.

What is your name?

Where do you live?

How long are you staying in the Park?

So far, what is your favorite thing about Shenandoah National Park?

Where are you?

Welcome to Shenandoah National Park! A good *explorer* always wants to learn more about the places he or she visits. Study the Park map below and answer the questions.

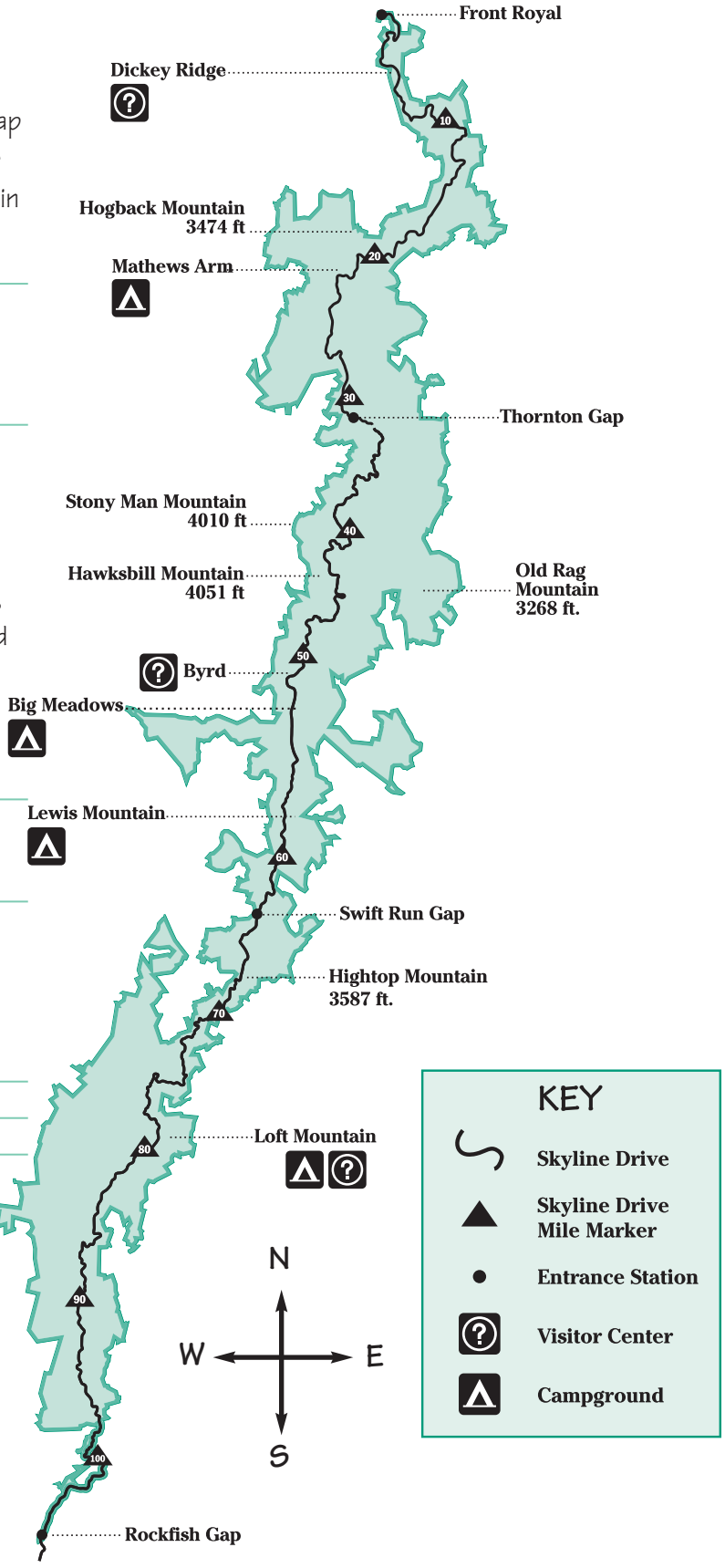
A "key" describes what the symbols on the map mean. Look at the key and find the symbol for "visitor center." How many visitor centers are in Shenandoah National Park?

What is the name of the road that runs through the Park?

The Skyline Drive is 105 miles long! Cement posts on the west side of the road number each mile. Milepost 0 is at Front Royal and Milepost 105 is at Rockfish Gap. On this map, a ▲ marks every 10 miles of Skyline Drive. Find Loft Mountain Campground on the map. What Milepost is closest to this campground?

What is the highest mountain in the Park?

A low point in the mountains is called a "gap." Name 3 gaps that are used as entrances to the Park.



Trail Explorer

To become a good explorer, you must learn to observe the world around you very closely. Hike one of the many trails in Shenandoah National Park and see how many things you can find on the lists below. Remember, never hike alone and leave things as you find them so others may enjoy what you have seen.

Put a ✓ beside the things you observe.

Plants

___ A flower
___ A fern
___ A tree with leaves larger than your hand
___ A tree that has fallen down
___ A plant smaller than your thumb
___ A tree with smooth bark
___ A tree you can't put your arms around
___ A plant with heart-shaped leaves

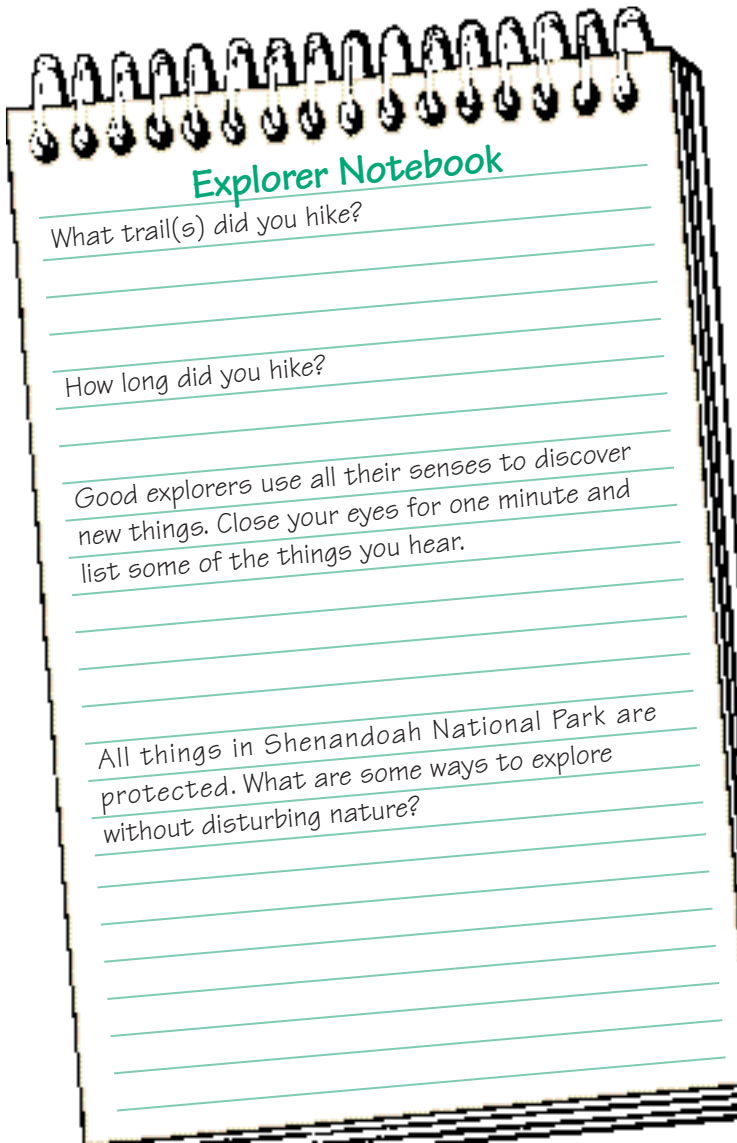
Animals

___ A spider
___ A butterfly
___ A grasshopper
___ A deer
___ A squirrel
___ A groundhog
___ A bird
___ An ant

Other things

___ A nut or acorn
___ A sweet-smelling flower
___ A woodpecker hole
___ Moss on a log or rock
___ A smooth, flat rock
___ An animal track
___ A spider's web
___ Evidence that people lived here:
  ___ apple trees
  ___ a house foundation
  ___ old fences

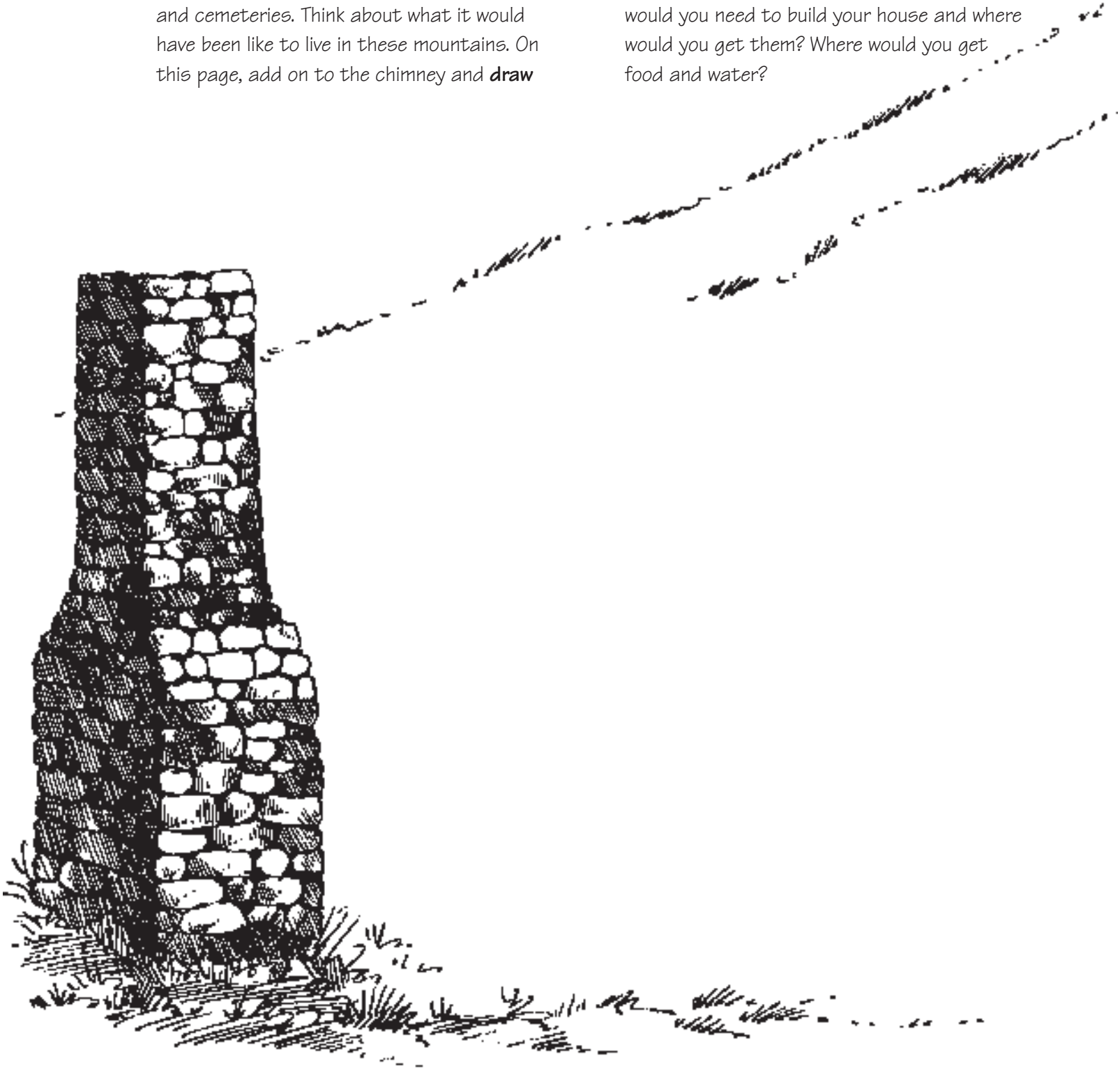
Draw your favorite discovery in the space below.



Traces of the Past

People lived in the mountains of Virginia long before there was a national park here. They raised families, farmed, hunted, harvested timber, and grazed animals in this area. In the early 1900's, nearly 500 families lived in what is now Shenandoah National Park. The land provided them with almost everything they needed.

While exploring, look for old buildings, fences and cemeteries. Think about what it would have been like to live in these mountains. On this page, add on to the chimney and ***draw*** *the house you would have built. What materials would you need to build your house and where would you get them? Where would you get food and water?*



Many people thought the area would be a good place for a national park. The Commonwealth of Virginia bought land in the mountains to create a park, and the families living here had to leave their homes. This land was donated to the United States government, and Shenandoah National Park was created. President Franklin Roosevelt dedicated this Park to all Americans on July 3, 1936.

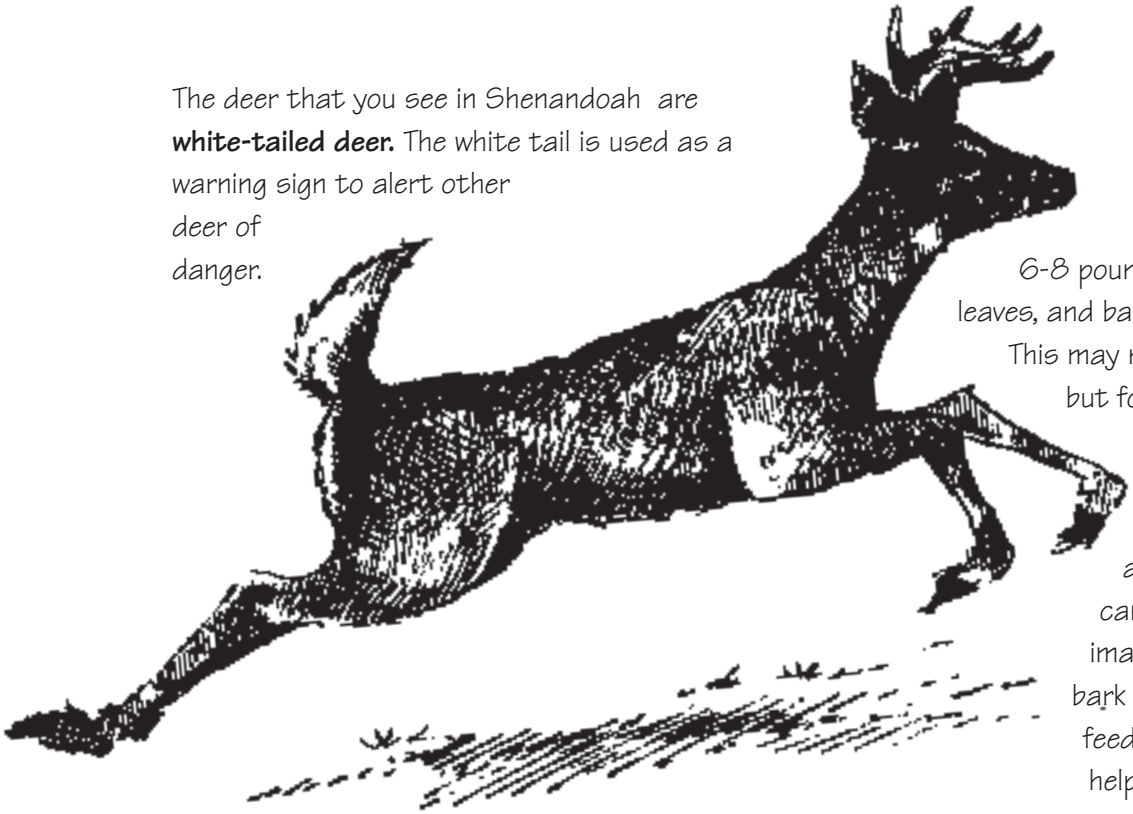
Explorer Notebook

Would you leave your home so that a national park could be created? Why or why not?

Habitat for Deer

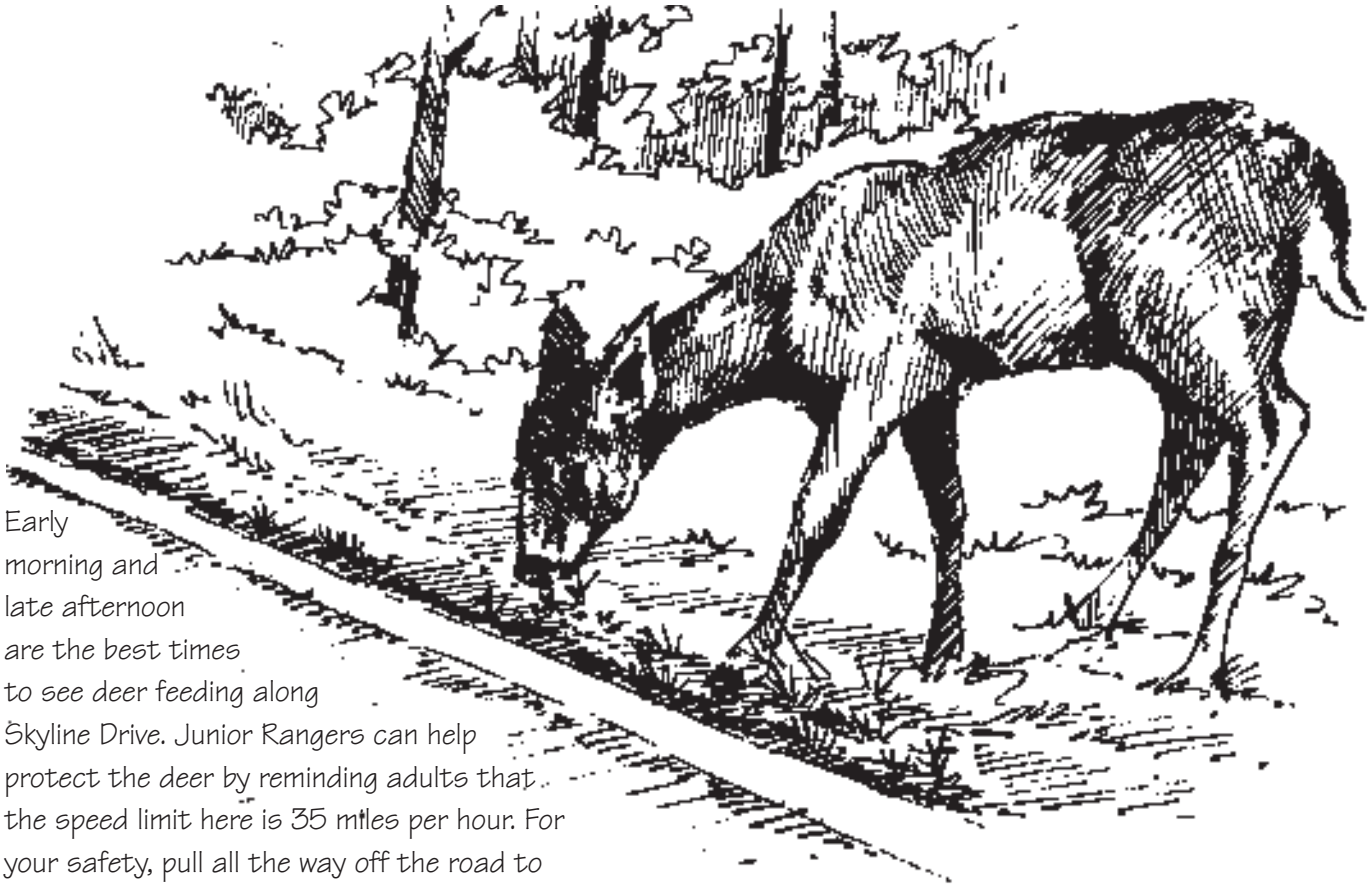
A *habitat* is a place where an animal finds the things it needs to live - food, water, shelter, and space. Many animals such as deer find perfect habitats in Shenandoah National Park. Deer find shelter in the forest, food in the meadows, water in the streams, and plenty of space to roam in the Park. Park Rangers in Shenandoah help protect deer, and as a Junior Ranger, this is also your job.

The deer that you see in Shenandoah are **white-tailed deer.** The white tail is used as a warning sign to alert other deer of danger.



How does a menu of 6-8 pounds of twigs, grasses, leaves, and bark sound for a day? This may not sound tasty to us, but for a deer it's perfect. Many people want to feed deer in the Park, but this is not allowed. Human food can hurt deer. Just imagine if a deer fed you bark and twigs! By not feeding deer, you are helping the rangers protect the Park's wildlife.

Fawns (baby deer) are born in late spring. Their spotted coats make them hard to see. By lying perfectly still, they are protected from predators who have a hard time seeing them. The mothers may leave the fawns for a short time to feed. If you see a fawn alone, do not touch it or move it. If you do, its mother may not be able to find it when she returns.



Early morning and late afternoon are the best times to see deer feeding along Skyline Drive. Junior Rangers can help protect the deer by reminding adults that the speed limit here is 35 miles per hour. For your safety, pull all the way off the road to view animals.

Deer detective

Take 10 minutes to study a deer. Observe animals from a distance so you don't disturb them. Remember, this is the deer's home, and you are a visitor here.

How many deer do you see?

What are they doing?

What are they getting from their habitat now - food, water, shelter, or space?

Write down any other interesting things you observe while watching the deer.

Explorer Notebook

What are 2 things you can do to help protect deer in the Park?

What should you do if you see someone feeding a deer?

The loss of habitats hurts many animals. How is Shenandoah National Park important in providing habitats for animals to use in the future?

If you return to this Park in 50 years, do you think you will see deer? Why or why not?

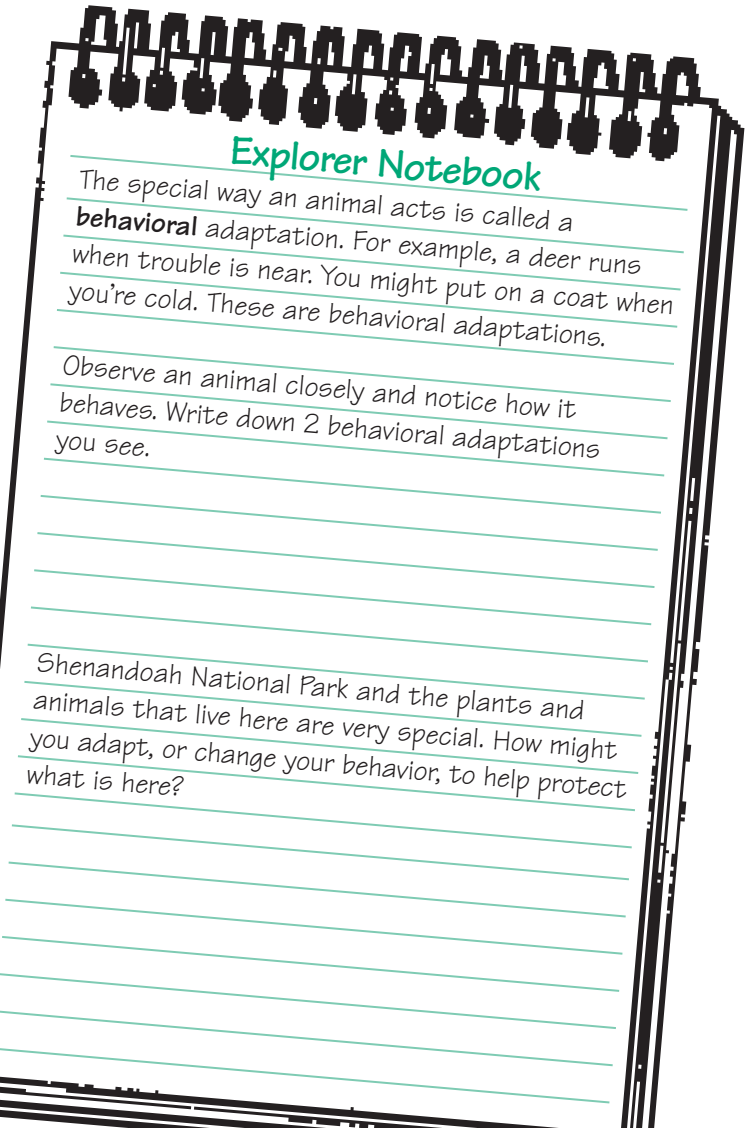
Amazing Adaptations

Every plant and animal has special features to help it survive in its habitat. These features are *adaptations*. For example, when fawns (baby deer) are born, they have no odor so predators can't smell them. Some plants, like black locust and thistles, have sharp spines or thorns which help protect the plant. These are adaptations.

Use your imagination to create your own special plant or animal that lives in Shenandoah National Park and helps clean the environment.

What does it do to help the environment? What special adaptations does it have so it can do this?

Draw your creation on this page.



Explorer Notebook

The special way an animal acts is called a **behavioral** adaptation. For example, a deer runs when trouble is near. You might put on a coat when you're cold. These are behavioral adaptations.

Observe an animal closely and notice how it behaves. Write down 2 behavioral adaptations you see.

Shenandoah National Park and the plants and animals that live here are very special. How might you adapt, or change your behavior, to help protect what is here?

Not an Eagle

What is that large dark bird you have been seeing since you entered the Park? You may think it is an eagle or a hawk, but more than likely it is a vulture. Shenandoah National Park has two vultures - *turkey vultures* and *black vultures.* These birds are easily viewed from the many overlooks on Skyline Drive. Note: Turkey vultures are seen more often than black vultures in this Park.

Turkey vultures soar with wings in a "V" position and rock from side to side. They seldom flap their wings. Turkey vultures are larger than black vultures.

Black vultures soar with wings in a flat position. They flap their wings rapidly and glide in short bursts.

Vultures feed on dead animals, and eating can be messy. To keep clean and healthy, vultures don't have feathers on their head. Instead they have a thick skin that stays cleaner than feathers would after feeding. The adult turkey vulture has a red head and the black vulture has a gray head.

turkey vulture

black vulture

Explorer Notebook

List 3 differences between turkey vultures and black vultures.

Observe a vulture for 10 minutes. What is it doing? Are there other vultures in the area?

When was the last time you ate a decaying carcass for lunch? Vultures do it all the time! Can you think of a reason why this is important?

News of the Weird

Talking birds, flowers that throw their seeds, pole-vaulting insects - a good explorer can find all of these in the forests of Shenandoah National Park. Study the page below and learn about some of the unusual things you may find while exploring the Park.

Springtails

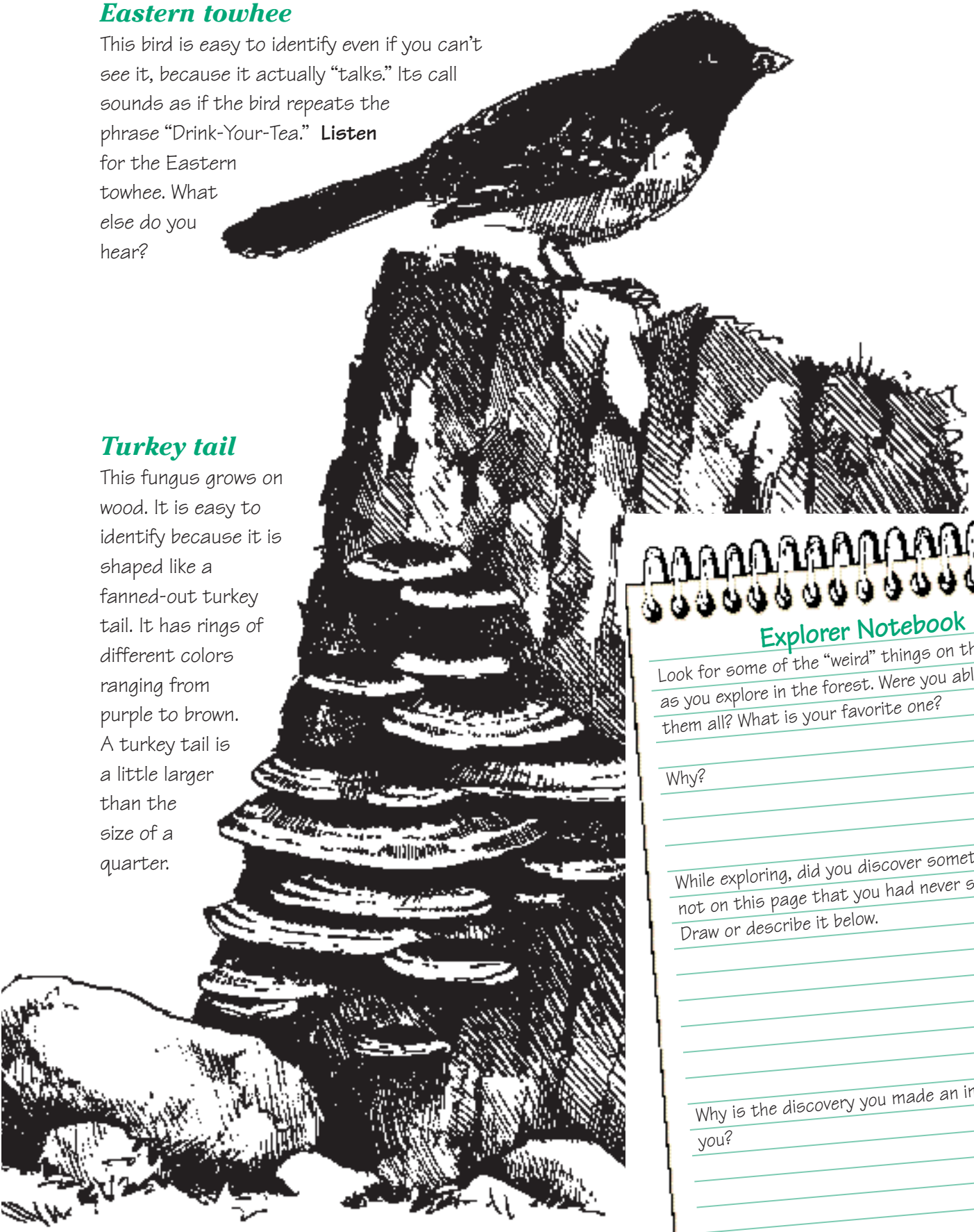
To see a springtail you must get close to the action. These insects are about a millimeter long and can usually be seen crawling on large rocks. The springtail is a fantastic jumper. It can "pole-vault" several inches by folding its tail under itself and pushing off with it. If you were a springtail, you could jump half the length of a football field!

Touch-me-not (Jewelweed)

Touch-me-nots grow in moist areas. Their yellow/orange flowers bloom in the summer. The plant gets its name from the unique way it spreads its seeds. When the seed pod is ripe, the slightest touch causes the plant to throw its seeds... sometimes several feet.

Eastern towhee

This bird is easy to identify even if you can't see it, because it actually "talks." Its call sounds as if the bird repeats the phrase "Drink-Your-Tea." **Listen** for the Eastern towhee. What else do you hear?



Turkey tail

This fungus grows on wood. It is easy to identify because it is shaped like a fanned-out turkey tail. It has rings of different colors ranging from purple to brown. A turkey tail is a little larger than the size of a quarter.

Explorer Notebook

Look for some of the "weird" things on this page as you explore in the forest. Were you able to find them all? What is your favorite one?

Why?

While exploring, did you discover something that was not on this page that you had never seen before? Draw or describe it below.

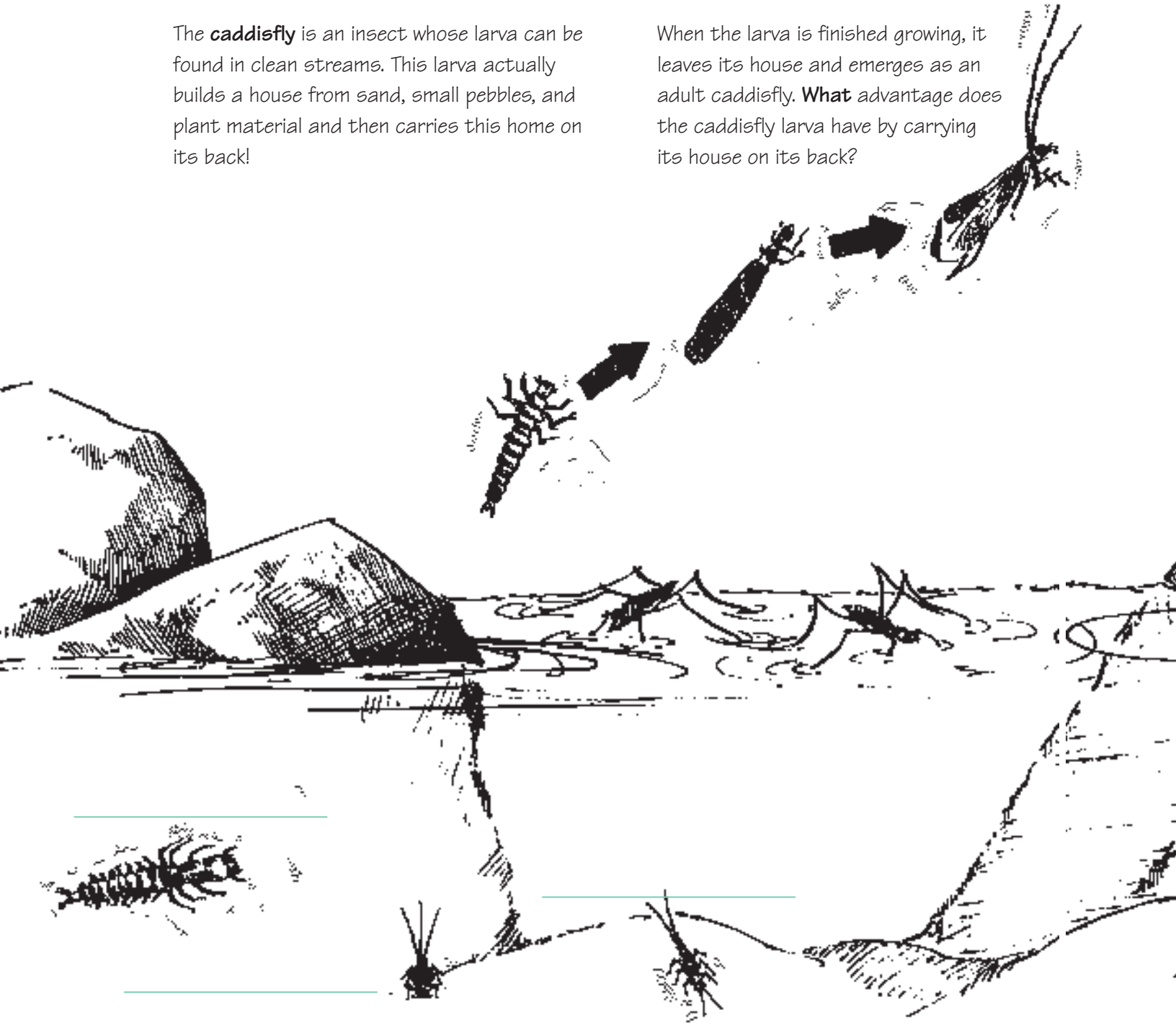
Why is the discovery you made an important one to you?

What's in the Water?

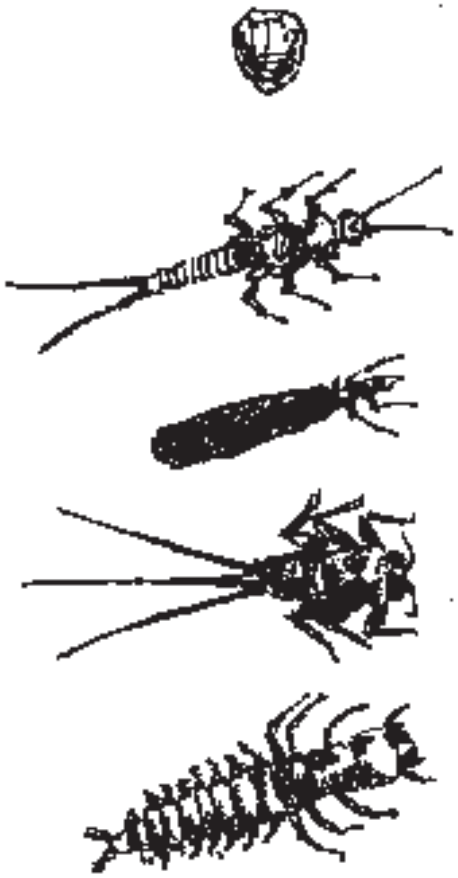
The streams in Shenandoah National Park are home to many animals. Because of their small size and coloration, many stream animals go unnoticed. Some insects actually spend the early part of their life (known as the *larva* stage) in the stream. Clean water is very important to the larva and many larvas cannot live if the stream is polluted. Use this page to help you study a stream in Shenandoah. Remember, never hike alone and always have an adult with you. Wet rocks near streams can be *very* slippery!

The **caddisfly** is an insect whose larva can be found in clean streams. This larva actually builds a house from sand, small pebbles, and plant material and then carries this home on its back!

When the larva is finished growing, it leaves its house and emerges as an adult caddisfly. **What** advantage does the caddisfly larva have by carrying its house on its back?



Label these insect larvas in the stream below.



Water penny

Lives on underside of rocks. Adult is called riffle beetle.

Stonefly

Found crawling on the underside of rocks in fast-moving water.

Caddisfly

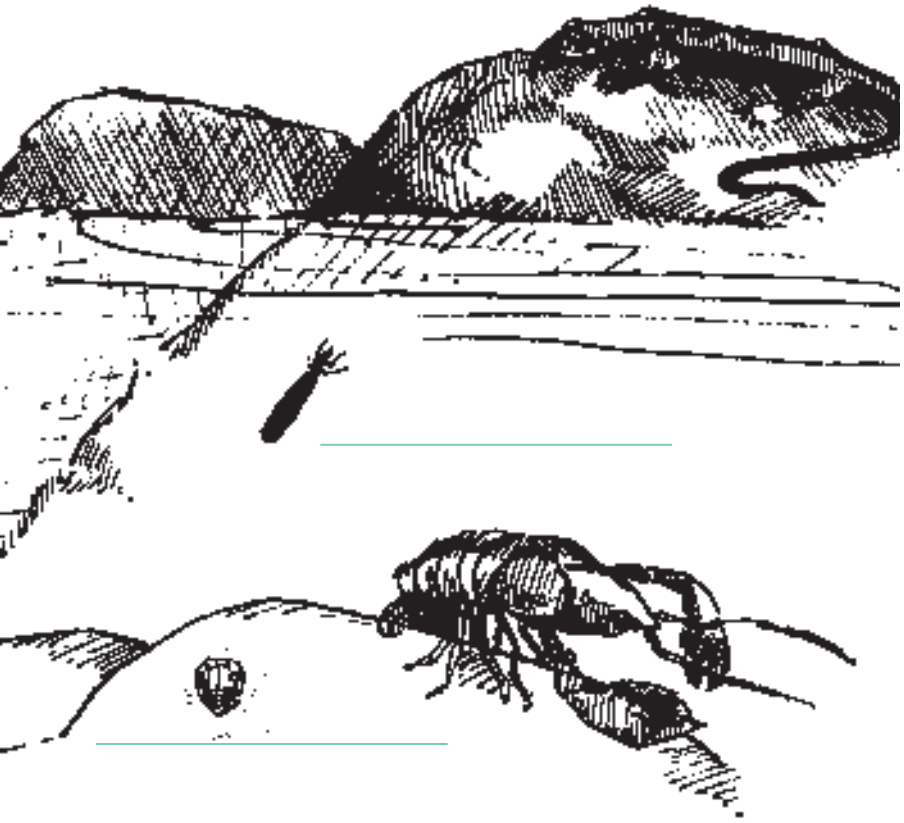
Makes its home from sand, small pebbles, and plant material.

Mayfly

Found in same place as stonefly.

Hellgrammite

Found under rocks or in mud in moving water. Adult is called dobsonfly.



Explorer Notebook

Explore a stream in Shenandoah and answer the questions below.

Draw or describe an animal you found that was not on the list above.

What might make a stream in Shenandoah National Park polluted?

How can you help keep our streams clean?

Trees are Everywhere

Can you imagine Shenandoah National Park without any trees? It's hard to do because trees are everywhere in this Park! They provide homes and food for animals such as squirrels, bears, and birds. Use the descriptions below to identify the 7 trees on this page and write the name beside each leaf.

The **sassafras** has leaves with 3 different shapes.

The **red oak** produces acorns which provide food for many animals. The large leaves have 4-6 "fingers" which end in points.

The **striped maple** has leaves with 3 points. The bark on this tree is green with white stripes.

The **hemlock** has leaves that look like small, flat needles about 1/2 inch long.

The **black locust** has thorns on its branches. The long leaves have 12-15 leaflets (small leaves). Each leaflet is about the size of a quarter.

The **American chestnut** has long, oval leaves with many sharp points around the edge like the blade of a saw. Leaves like this are called toothed leaves.

The **tuliptree** has leaves with 6 points. In the spring, the tuliptree has yellow and orange flowers that look like tulips.

In the space below, **draw** any new leaves you find. If you can't identify them, ask a ranger to help you. Protect trees by not picking their leaves.

Explorer Notebook

Hike in the forest. Find and study one tree from this page.

Which tree did you study? What does the bark feel like?

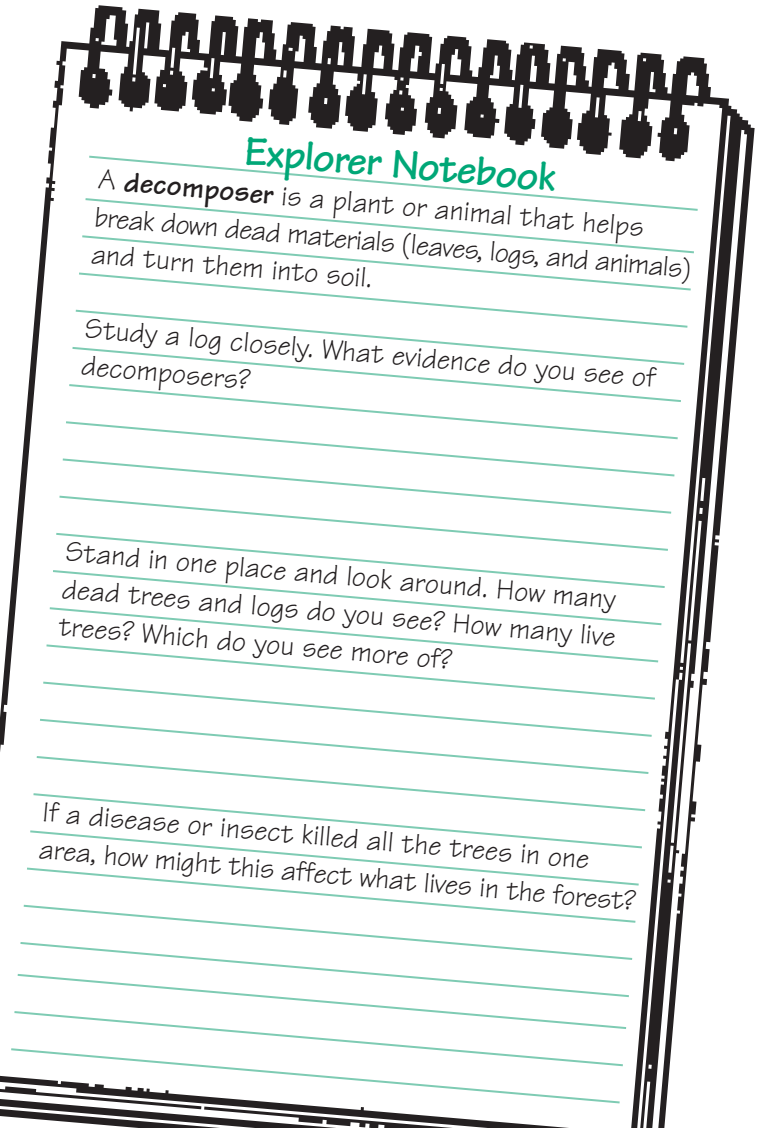
Look closely. What animals make their home in this tree? What insects?

If you come back to this Park in 20 years, could you find this tree again? How might it change in that time?

Logs of Life

Even in Shenandoah National Park trees die. Insects, such as gypsy moths, are changing the forest. Gypsy moth caterpillars weaken trees by eating the leaves. Weak trees die because they don't have the energy to survive drought and disease as other trees do. But even dead trees are important in the forest. Small animals and insects find food and shelter in dead trees and logs. Logs in the forest are full of life!

Explore a log in Shenandoah for animals and insects. **Draw** 3 living things you find and describe how each one needs the log to survive. Remember that logs are home to many small creatures. Protect their homes by being careful as you explore.



Explorer Notebook

A **decomposer** is a plant or animal that helps break down dead materials (leaves, logs, and animals) and turn them into soil.

Study a log closely. What evidence do you see of decomposers?

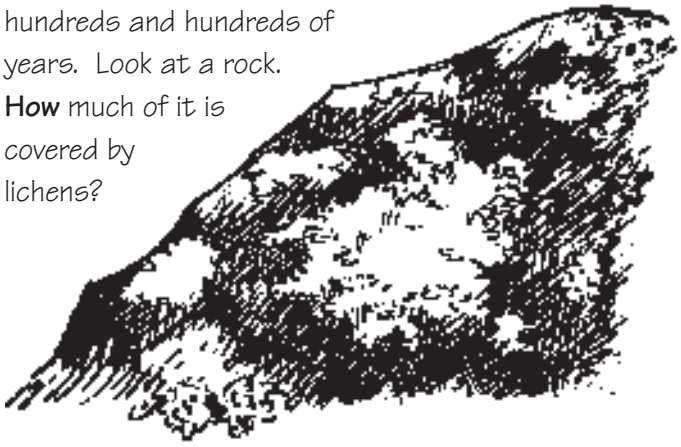
Stand in one place and look around. How many dead trees and logs do you see? How many live trees? Which do you see more of?

If a disease or insect killed all the trees in one area, how might this affect what lives in the forest?

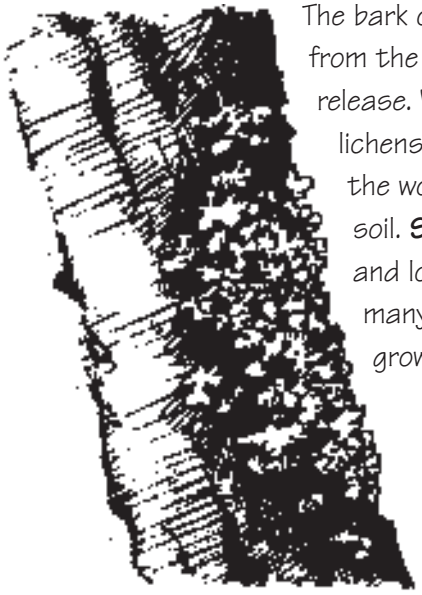
What's on the Rocks & Trees?

Look closely in the forests of Shenandoah National Park and you will see a plant that eats rocks! This plant is *lichen* (pronounced like-un). A lichen is actually made up of 2 different plants - fungi and algae. These plants help each other by living together. The fungi provide a moist place for the algae, and the algae make food from sunlight. Lichens grow on rocks and trees and other places where plants usually don't grow. Once you notice lichens, you will see them everywhere!

Can you believe that lichens eat rocks? Slowly but surely, they release chemicals that break down rocks. This takes a long time - hundreds and hundreds of years. Look at a rock. **How** much of it is covered by lichens?

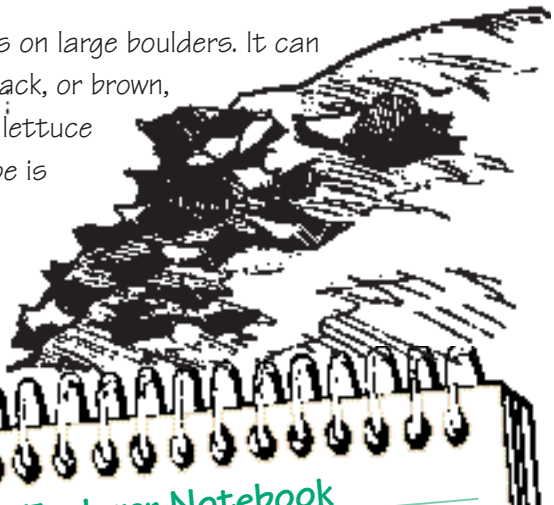


Many lichens grow on trees. Even though lichens can break down rocks, they do not hurt **live** trees. The bark on trees protects it from the chemicals lichens release. When trees die, lichens help break down the wood and turn it into soil. **Stand** in one place and look around. How many trees have lichens growing on them?



Rock tripe

This lichen grows on large boulders. It can be pale green, black, or brown, and it looks like lettuce leaves. Rock tripe is very brittle - be careful not to destroy it while exploring.



Explorer Notebook

Explore a trail and look for lichens. Where do you see the most lichens?

Look at one rock or tree. List the different colors of lichen you see.

Draw and describe a lichen you see. How large is it? What does it feel like?

How do lichens help other forest plants by breaking down rocks and dead trees?

The Air Up There

Shenandoah National Park is well known for its beautiful views. While you visit, look out across the mountains. Does the air look clean? Can you see a long way? Sometimes the air in Shenandoah becomes dirty. Wind may bring pollution to our Park from places hundreds of miles away! When this happens, it is difficult to see the beauty of the mountains.

Visit an overlook

The overlooks at Milepost 21, Mile 38.6 and Mile 67.8 on Skyline Drive have signs on visibility. In the space above, **draw** the view from one of these overlooks.
Does the air look clean or dirty?

Write down one thing you learned by reading the sign.

**If you can't visit an overlook, draw a picture from your favorite viewpoint.

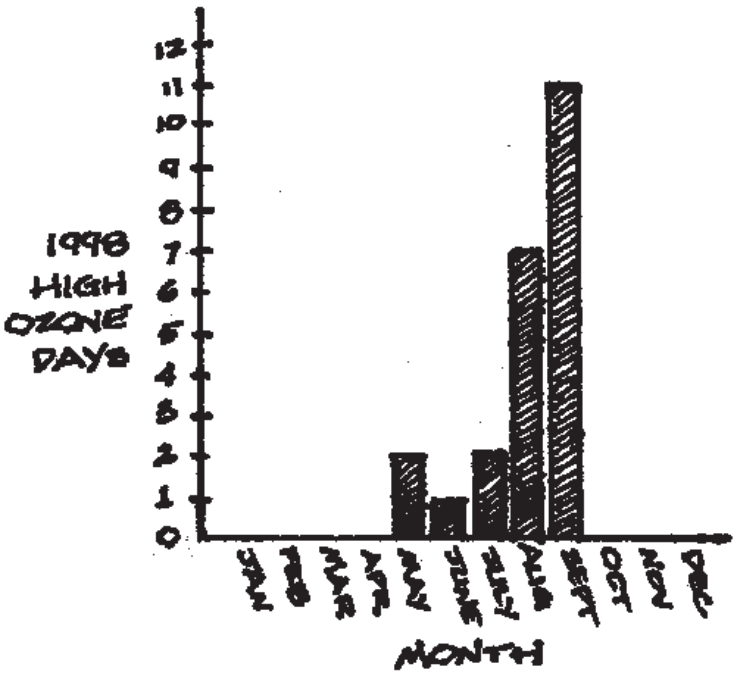
Pollution comes to Shenandoah National Park from places far away.

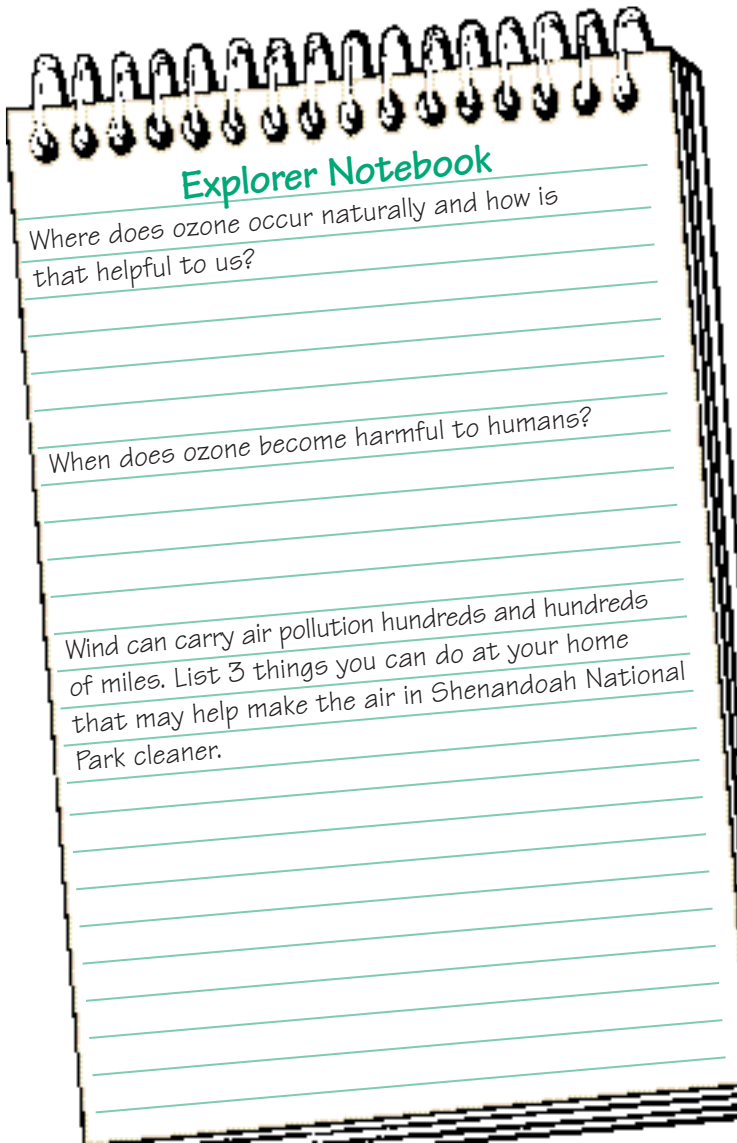
Ozone - What is it?

Ozone is an invisible gas that occurs naturally high in the sky. This ozone protects us from the harmful rays of the sun. Ozone can also be found close to the ground, but this ozone is **not** natural. Sometimes pollution from factories and cars can turn into ozone on hot, sunny days. When pollution turns into ozone, it stays close to the ground. Ozone close to the ground may harm plants and animals. If the ozone level near the ground becomes high, it can damage the lungs of humans!

Scientists at Shenandoah National Park monitor air quality. Below is a graph from data collected in 1998. It shows the number of days in the Park when ground level ozone exceeded government safety standards.

1. Which two months had the most days of high ozone?
2. Why do you think ozone levels were high during these months?

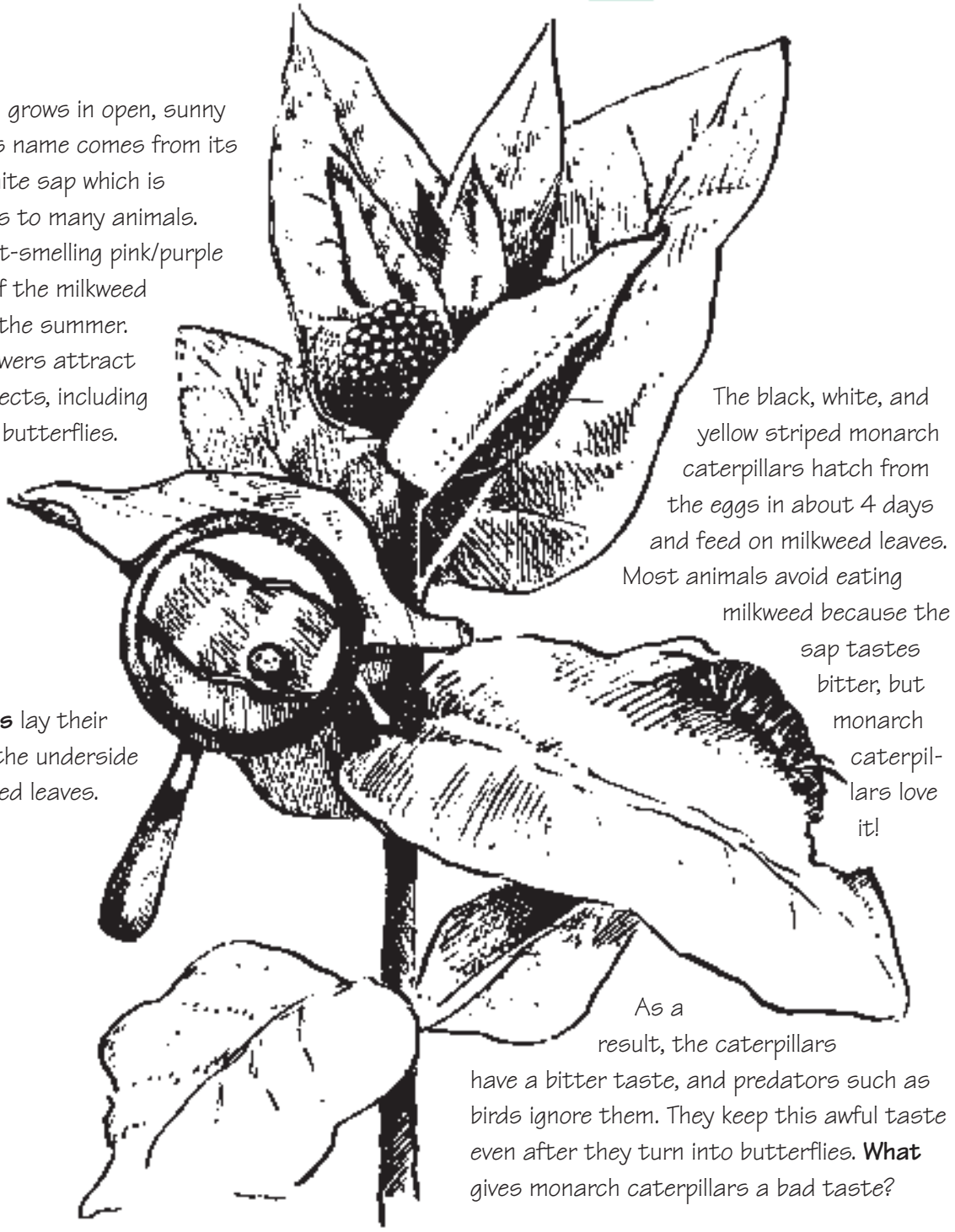




Monarchs & Milkweeds

Each year, Shenandoah National Park receives thousands of visitors from the country of Mexico. These visitors travel thousands of miles to see a plant that we sometimes take for granted - the *milkweed.* But these visitors are not people; they are butterflies known as *monarchs.* This black and orange butterfly depends on the milkweed for survival.

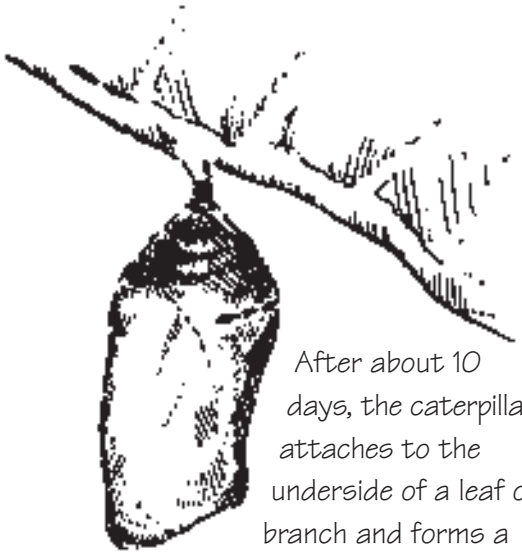
Milkweed grows in open, sunny areas. Its name comes from its sticky white sap which is poisonous to many animals. The sweet-smelling pink/purple flowers of the milkweed bloom in the summer. These flowers attract many insects, including monarch butterflies.



The black, white, and yellow striped monarch caterpillars hatch from the eggs in about 4 days and feed on milkweed leaves. Most animals avoid eating milkweed because the sap tastes bitter, but monarch caterpillars love it!

Monarchs lay their eggs on the underside of milkweed leaves.

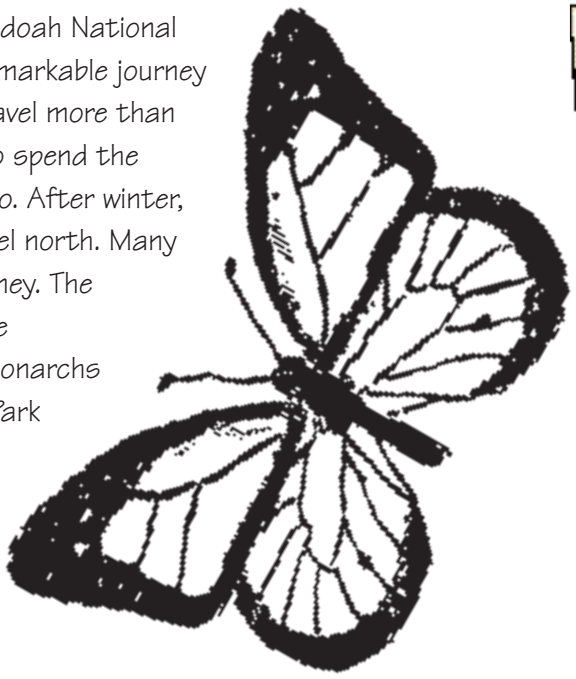
As a result, the caterpillars have a bitter taste, and predators such as birds ignore them. They keep this awful taste even after they turn into butterflies. **What** gives monarch caterpillars a bad taste?



After about 10 days, the caterpillar attaches to the underside of a leaf or branch and forms a **chrysalis.** Inside the chrysalis, the caterpillar changes into a butterfly. After about 12 days, the chrysalis breaks open, and an adult monarch butterfly comes out. **Where** would you look for a monarch chrysalis?

Flowers turn into milkweed seed pods which open in the fall. Each seed has a silky "parachute." The wind blows the seeds to other places and new milkweeds will grow in the spring.

In the fall, monarch butterflies born in Shenandoah National Park begin a remarkable journey south. They travel more than 2,000 miles to spend the winter in Mexico. After winter, monarchs travel north. Many die on the journey. The offspring of the Shenandoah monarchs return to the Park and lay their eggs.



Explorer Notebook

How many different insects can you find on a milkweed? Draw an insect you found.

What would happen to the monarch butterfly if milkweed plants disappeared?

Monarchs spend the winter in Mexico. What might happen to the monarchs if the land they need in Mexico is not protected as Shenandoah National Park is?

They're Back!

They're fast...they're rare...they're birds...and they're back! During your visit to the Park, you might catch a glimpse of one of the world's fastest animals – the *peregrine falcon.* Years ago, falcons used to nest here, but only recently have they returned. For years, biologists worked to reintroduce peregrines to the Park ecosystem by raising and releasing them in the mountains. In 1994, two falcons returned and raised young in the Park. Their offspring were the first peregrines hatched naturally in the mountains of Virginia in over 40 years!

Many years ago a chemical called DDT was sprayed on crops to kill insects. DDT is harmful to peregrines. It keeps their egg shells from getting hard. Many falcon eggs broke before young could hatch and fewer peregrines were born. Today, DDT is not used in the United States, and peregrines are making a gradual comeback!

What's for dinner? Peregrines have an unusual diet. They eat other birds! They have keen eyesight and soar high in the sky looking for food. When they spot another bird, they dive after it and snatch it out of the air. When diving for food, peregrines can reach speeds of over 100 miles per hour!

The strong, sharp claws on pergrines are **talons**. Talons help peregrines capture and kill prey.

Are you a falcon expert?

How fast can a peregrine falcon dive?

Adaptations are features that help animals survive. Name 2 adaptations that peregrines have.

Would you look for a peregrine in a forest or at an overlook? Why?

The black head and "sideburns" are a way to identify the peregrine falcon.

Peregrines prefer to live on steep, rocky slopes. They do not make nests like other birds - instead they lay their eggs directly on rock ledges.

Explorer Notebook

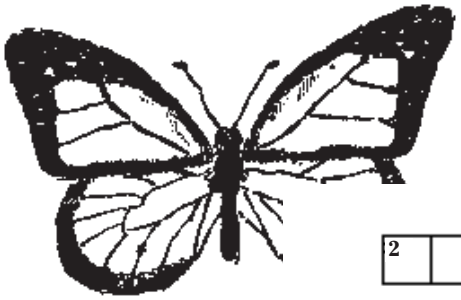
Why do you think it is important that peregrine falcons have returned to this Park?

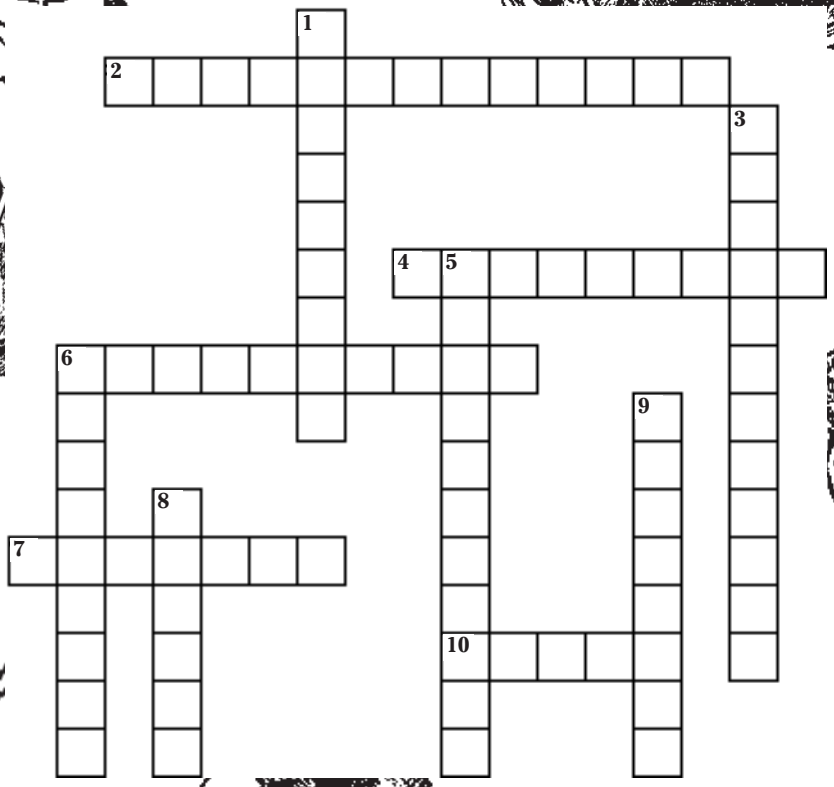
What could you do to make people more aware of rare species such as the peregrine falcon?

Park Rangers are very interested to know where people see peregrines in the Park. If you see a peregrine, make notes describing where you saw it and what it was doing. Let a ranger know what you saw.

Shenandoah Words

Complete this crossword puzzle using the "Shenandoah words" you have learned while becoming a Junior Ranger. Look back through this book if you need help. Good luck!





Across

2. A large bird often seen soaring with its wings in a "V" position.
4. This insect larva makes its home from sand, small pebbles, and plant material. It is found in clean water.
6. The name of the national park where you got this Junior Ranger book.
7. Food, water, shelter, and space make up a _____.
10. An invisible gas that protects us from the harmful rays of the sun.

Down

1. This falcon can dive at speeds of over 100 miles per hour when hunting for food.
3. This famous road runs through Shenandoah National Park.
5. These special features help plants and animals survive.
6. This tree has leaves with 3 different shapes.
8. A "rock eating" plant made up of fungi and algae.
9. Monarch butterflies lay their eggs on this plant found in Shenandoah National Park.

Ranger Program #1

Title of program: _____

Write down one thing you learned from this program: _____

_____

_____

Park Ranger signature: _____ Date: _____

Ranger Program #2

Title of program: _____

Write down one thing you learned from this program: _____

_____

_____

Park Ranger signature: _____ Date: _____

Junior Ranger Certificate

_____

(your name)

has completed all of the requirements for becoming a Shenandoah National Park Junior Ranger and pledges to protect all national parks for future generations.

_____

Park Ranger signature

_____

Date

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