Program Name: Plant and Animal Detectives

Suggested Grade Level: 1st

Maximum Group Size per Day: 120 students (plus chaperones)

The **Plant and Animal Detectives** program is led by teachers and chaperones with the assistance of an education ranger at the Park. Backpacks with activity instructions and materials for up to 120 students are provided for the in-park activities. Each backpack contains materials for up to 12 students that include:

- instructions for the in-park activities
- hand lenses
- pencils
- laminated pictures of animals
- four strips of flagging tape
- first-aid kit

The Raptor Rap, a 30-minute ranger-led presentation with a live bird of prey, is available upon request, depending on raptor availability. If a raptor is not available, teachers may request the Mystery Box to be used on-site.

This lesson plan includes pre-visit, on-site, and post-visit activities that can be shared with all teachers and chaperones to familiarize themselves with the activities prior to the field trip.

Overview

Plants and animals live all around us and each one has the same life needs. Students will explore Shenandoah National Park to discover the different plants and animals that live in the Park. Students will investigate how, where, and why plants and animals meet their life needs in their respective environments and how Shenandoah National Park provides protection for plants and animals. Students will evaluate human and environmental impacts to consider and practice stewardship behaviors that support a healthy environment.

Learning Objectives

Following the Park experience and classroom activities, the students will be able to

1. describe the life needs of plants and animals (plants: nutrients, air, water, light, and a suitable place to grow and live; and animals: adequate air, food, water, shelter, and space);
2. identify the four functional parts of a plant (roots, stem, leaves, and flowers) and identify all structures the plant uses to meet its life needs;
3. name three different animals that live in Shenandoah National Park and describe how specific physical characteristics help animals move, find homes, and obtain food;
4. describe how places like Shenandoah National Park help protect our limited natural resources.

Virginia Science Standards of Learning

Scientific and Engineering Practices

1.1 The student will demonstrate an understanding of scientific and engineering practices by
- a) asking questions and defining problems
- b) planning and carrying out investigations
- c) interpreting, analyzing, and evaluating data
- d) constructing and critiquing conclusions and explanations
- f) obtaining, evaluating, and communicating information

Living Systems and Processes

1.4 The student will investigate and understand that plants have basic life needs and functional parts that allow them to survive. Key ideas include
- a) plants need nutrients, air, water, light, and a place to grow;
- b) structures of plants perform specific functions;
- c) plants can be classified based on a variety of characteristics.

1.5 The student will investigate and understand that animals, including humans, have basic life needs that allow them to survive. Key ideas include
- a) animals need air, food, water, shelter, and space (habitat);
- b) animals have different physical characteristics that perform specific functions;
- c) animals can be classified based on a variety of characteristics.

Earth Resources

1.8 The student will investigate and understand that natural resources can be used responsibly. Key ideas include
- a) most natural resources are limited;
- b) human actions can affect the availability of natural resources;
- c) reducing, reusing, and recycling are ways to conserve natural resources.

Background Information

Plants and animals live together and rely on each other in Shenandoah National Park. All living organisms have the same basic needs – air, food, water, oxygen, and a suitable place to live. Living organisms use their environment to fill these needs.

Plants are living organisms. The structure of the plant helps it survive in its environment. The *roots* help provide support by anchoring the plant in the soil and collecting water and nutrients needed for growth. *Stems* transport water and nutrients absorbed by the roots to the leaves. Stems also provide support for the plant allowing the leaves to reach the sunlight needed to produce food. *Leaves* capture sunlight and are the site of the food production process called *photosynthesis* (a process by which a plant produces its food using energy from sunlight, carbon dioxide from the air, and water from the soil). Green plants are the only organisms that can convert the sun's light energy into food. As plants make food, one of the materials they produce is oxygen. Most plants

reproduce through seeds. Every *seed* is a tiny plant complete with leaves, stems, and root parts waiting for the right conditions to germinate and grow.

An animal is generally any living organism that is not considered a plant. All animals, including people, pets, and wildlife, have similar basic needs. All animals need a *habitat* - the place where the animal lives. An animal's habitat has air, food, water, shelter, and space. Animals need to move in their habitats to meet their life needs. Since they are unable to make their own food, animals get the food they need by eating other living things. An animal's body or *physical characteristics* (body coverings, body shape, appendages, and methods of movement) helps it survive in its habitat. *Wild animals* provide for their own life needs (food, shelter, water, and space) in their habitat. The animals in Shenandoah National Park are wild animals.

Vocabulary

- **animal** – generally any living organism other than a plant
- **habitat** – the arrangement of food, water, shelter or cover, and space suitable to animals' needs
- **leaves** – the physical structure of a plant that captures sunlight and makes food through a process called photosynthesis
- **plant** – vegetative living organisms that are not animals. Green plants produce their own food from sunlight (photosynthesis)
- **roots** – the physical structure of a plant that anchors a plant in the soil; roots help the plant obtain water and nutrients from the ground
- **seed** – the fertilized egg of a plant that will produce a new plant when it grows
- **stem** – the physical structure of a plant that holds the plant upright; the stem allows water, nutrients, and food to travel throughout the plant
- **tame animal** – an animal that depends on people to feed and take care of it
- **wild animal** – an animal that lives in a natural state, providing for its own food, shelter, and other needs in a suitable habitat

Pre-visit Activities

Prior to beginning the Plant and Animal Detectives unit study, have the students take the Plant and Animal Detectives **Pre-Visit Assessment**. Record the scores on the **Pre-visit/Post-visit Score Sheet**.

Begin the unit study and incorporate as many of the following pre-visit activities as possible into your lesson plan to prepare the students for their Park field trip.

Materials for Pre-visit Activities

student field journal (cover page, *Plant Scavenger Hunt, Animal Detective Walk, My Shenandoah Animal, How I Can Help,* attached), *KWL chart* (attached), salad ingredients: leaves (lettuce, spinach, cabbage), stems (celery, asparagus), roots (carrots, onions), fruit (tomatoes, cucumbers), flowers (broccoli, cauliflower), and seeds (sunflower seeds, beans), story: *Oodles of Animals* by Lois Ehlert, magazines or newspapers with pictures of animals, for each student, metal fasteners or stapler, crayons or other drawing supplies

1. **Create Shenandoah National Park Field Journals**
   Students will make a field journal to use during the Plant and Animal Detectives program**.**
   a) Print or copy a cover page and the on-site activity study sheets (*Plant Scavenger Hunt*, *Animal Detective Walk*, *My Shenandoah Animal, How I Can Help)* for each student. Add in extra drawing/writing pages and hole-punch the sheets. Journal contents may also include the program vocabulary list, pre-visit activity drawings, or any other appropriate material.
   b) Explain to students, "When scientists are studying plants and animals they use field journals to write down all of their observations. So, like scientists, we are going to make field journals for our trip to Shenandoah National Park."
   c) Provide each student with a set of field journal sheets and metal fasteners. Have students assemble their field journals to use during the Plant and Animal Detectives study. Allow the students personalize their journal covers if desired.
   d) Remember to take the assembled field journals to use during the field trip to Shenandoah National Park.

2. **I Wonder - KWL Chart**
   On the chalk board or attached sheet, make a list of what the students **know** about plants and animals. Have students ask questions about anything that they **want** to know about plants or animals (for example, how animals move, what they eat, or where animals and plants live). Keep these to complete the "What I Learned" for Post-visit Activity #1.
   K: What I **know**
   W: What I **want** to know
   L: What I **learned**

3. **Plant Parts Salad**
   Build a salad with all the parts of a plant. As you add ingredients into the salad, have students explain which part of the plant it is from and what that part does. Include leaves (lettuce, spinach, cabbage), stems (celery, asparagus), roots (carrots, onions), fruit (tomatoes, cucumbers), flowers (broccoli, cauliflower), and seeds (sunflower seeds, beans). Mix your salad, add dressing if desired, and enjoy eating plant parts!

4. **Animal Classification**
   a) Read the story, *Oodles of Animals*, by Lois Ehlert to introduce students to a variety of animals and different animal characteristics.
   b) Have students cut out pictures of any animal they find in magazines and newspapers or print from the internet. Sort the animals into different categories. Example: animals with fur, animals with scales, animals with feathers, animals with two legs, animals with four legs, animals with no legs, animals that fly, animals that walk, animals that slither, animals that swim.
   c) Discuss with students the difference between wild and tame animals. Ask the students to sort or classify their animals as "wild" or "tame." Invite students to use

poster board and glue to make a wild animal collage. Ask students what types of animals they think are in Shenandoah National Park and discuss how to act around wild animals.

5. **Visiting a National Park – Leave No Trace**
The mission of the National Park Service is to preserve and protect the natural and cultural resources of the nation for all people to enjoy. It is important for today's park visitors to practice good stewardship ethics and behaviors in order to pass these unique natural and historical treasures on to future generations in an unimpaired condition.

We recommend following **Leave No Trace** (LNT) principles when going on a field trip. There are seven LNT principles:

- Plan Ahead and Prepare
- Travel (and Camp) on Durable Surfaces
- Dispose of Waste Properly
- Leave What You Find
- Minimize Campfire Impacts
- Respect Wildlife
- Be Considerate of Other Visitors

To prepare for your field trip to Shenandoah National Park, share with your students the mission of the National Park Service. Explain that they can help protect the beauty and natural resources of Shenandoah National Park by using good environmental stewardship practices.

a) Introduce the *Leave No Trace* principle of "Leave Objects Where You Find Them." Explain to the students that all the natural and historical things that they may find in the Park are protected because they are part of the Park. Ask students if they will be able to take things home with them from the Park, like a rock, for example. Explain to them that a rock can be a home for a beetle or a salamander, so even the rocks are protected. Acorns provide food for many animals. Cultural objects made by people more than 50 years ago are also protected because they are part of the history of the Park. Arrowheads, an old bottle, and wire fencing are examples of cultural objects that students may find in the Park.

Have students think of some unnatural objects that do <u>not</u> belong in the Park. Trash is one example. How can trash affect the animals that live in the Park?

Explain the need for protecting natural and cultural resources in all national parks. Think of consequences of making good decisions and poor decisions about objects students may find. During the field trip, take time to look at interesting rocks, plants, and animals, but make sure that all natural and cultural objects are left where they are found for other detectives to discover.

6. **Final preparation and planning for the field trip to Shenandoah National Park**
   - Approximately two weeks before the field trip, the lead ranger for the program will contact the lead teacher to discuss the final details of the field trip. Confirm if the Raptor Rap program will be part of the field trip.
   - Share field trip details with all participating teachers.
   - Review appropriate dress and behavior for the field trip and remind students they will still be in school while at the Park.
     - ✓ Recommended dress: Long pants, close-toed shoes (No sandals or flip-flops) and extra layers; it is often 10+ degrees cooler on the mountain than at school.
     - ✓ Have students write letters to their parents informing them about the time and date, appropriate dress, personal needs, and behaviors expected for the field trip.
   - Recruit enough competent chaperones to assist on the field trip. The park requires 1 adult for every 10 students.
   - Arrange for transportation and know the travel route to the program location in the Park.
   - Plan for lunch. School groups are welcome to picnic in the Park after the program. Picnic areas offer picnic tables and restrooms, but there are no shelters for inclement weather.
   - Contact your lead ranger if you have any last-minute questions or changes in your planning.

Shenandoah National Park Field Trip

The in-park Plant and Animal Detectives program is usually done in the Big Meadows area, Byrd Visitor Center, Milepost 51 on Skyline Drive. The program will generally take a minimum of 2 hours. Plan for adequate travel time from your school to meet the ranger at the scheduled time and location. For an effective learning experience, please remember the following:

- Before arriving at the Park, divide the students into groups of up to 12 and assign chaperones to each group.
- Upon arrival, meet the ranger and coordinate a bathroom and snack break prior to the in-park program.
- Let the ranger know how much time you have in the Park and your travel schedule requirements for returning to school.
- The park ranger will serve as your logistical guide to oversee your bathroom break, will issue and orient teachers and group leaders to the Plant and Animal Detectives backpacks, provide a short welcome to your entire group, be available as needed during the self-guided program, and lead the Raptor Rap program, if scheduled.
- Re-board the bus and move to the meadow parking area at the Rapidan Road gate, across Skyline Drive from the Big Meadows Wayside. Disperse the student groups in the meadow and complete as many of the on-site activities as time permits.
- After the completion of the meadow activities, board the school bus and drive to the Big Meadows Amphitheater if the Raptor Rap program has been scheduled as part

of the field trip. If there is no Raptor Rap program, return the backpacks to Byrd Visitor Center.

On-site Activities

1. **Plant Part Scavenger Hunt**
   Time: 20 minutes
   Materials: hand lenses, *Plant Part Scavenger Hunt* journal page
   Basics: Students explore the meadow for different kinds of plants.
   Procedure: Have students complete a plant part scavenger hunt searching for flowers, bushes, and trees in the meadow. Remind students they are in a national park and should not pick or pull plants out of the ground. They should examine plants for roots, stems, leaves, flowers, and seeds. To see roots, look for tree roots above the ground. Gather the group and discuss student findings. What do plants need to survive? How do their structures help them stay alive?

   Safety message: *Please tell the students that some wild plants, leaves, nuts, and berries are poisonous to people. Animals can eat almost any kind of wild plant and not get sick, but people cannot!*

2. **Animal Detectives Discovery Walk**
   Time: 20 minutes
   Materials: hand lenses, *Animal Detectives Discovery Walk* journal page
   Basics: Students explore the meadow to search for things necessary for life.
   Procedure: Take a short walk through the meadow and use the *Animal Detectives Discovery Walk* page to record observations. Allow time to explore the meadow and the forest edge to search for evidence. After a 10-15 minute search, gather the students and ask each student to name at least one thing that they discovered in the meadow that would help an animal survive.

3. **My Animal In SNP**
   Time: 20 minutes
   Materials: Flagging strips, animal picture cards, *My Shenandoah Animal* journal page
   Basics: Students pretend to be animals living in Big Meadows.
   Procedure: Locate the flagging strips and animal picture cards inside the backpack. Use the flagging strips to mark four boundary corners in the meadow, approximately 30’ X 30’ square (to keep students and the teacher/chaperones within sight of each other). Have students work in pairs. Give each pair an animal picture card and have them imagine being that animal. How and where would they make their homes? Where would they get their food and water? Have pairs settle into imaginary homes inside the flagged designated boundary pretending to be their animals. Have them complete the My Shenandoah Animal page in their journals.

Ask the students if they would like living in the meadow. Ask "What would happen if houses were built in or next to the meadow?" Move the boundary markers in 10 paces to simulate a shrinking habitat. Ask "Is there still enough space for everyone now? Could all of you still find everything you need to survive?" Remind the students that Shenandoah National Park helps to protect the habitats where animals live and meet their life needs.

***Note:** Please remember to remove the flagging strips and return them to the backpack upon completion of this activity.*

After the completion of your planned meadow activities, board the school bus and drive to the Big Meadows Amphitheater.

4. **The Raptor Rap (30 minutes)**
   Meet the park ranger at the amphitheater and take a closer look at one of Shenandoah National Park's common residents, either a hawk or an owl. What physical characteristics does the raptor have? How do these physical characteristics help the raptor meet its life needs? Where does it live? What does it eat? Why and how is it protected? The ranger will allow time for a student question and answer session.

***Note**: If a raptor is unavailable, the following activity may be substituted for The Raptor Rap.*

5. **The Mystery Box (30 minutes)**
   Divide students into groups of 12 or less. Choose a student to sit in front of each group and wear a blindfold. Give each blindfolded student a bag with a natural object from the Mystery Box inside it. Instruct the student to keep the object in the bag. Direct the other students to ask questions about the object. Example: Is it from a plant or animal? What shape is it? Does it feel rough or smooth? Ask the blindfolded student to use the sense of touch to answer the other students' questions. Have students guess the object. Repeat the game, as time allows, by rotating the objects between groups.

Post-Visit Activities

Following your field trip to Shenandoah National Park, use as many of the following post-visit activities as possible to conclude the unit of study. Give the students the Plant and Animal Detectives **Post-Visit Assessment.** Record the class scores on the **Pre-Visit/Post-Visit Score Sheet**. Complete the **Program Evaluation Form.** Return the program evaluation and pre/post-visit score sheet to:

Shenandoah National Park
3655 US Hwy 211 East
Luray, VA 22835
Attention: Education Office

Materials for Post-visit Activities

KWL chart (Pre-visit Activity #2), student journals, story: *The Salamander Room,* by Anne Mazer and Steve Johnson, pipe cleaners, wooden craft sticks and other art/craft materials, story: *The Lorax,* by Dr. Seuss, 6 plants, 6 paper cups, potting soil, brown paper lunch bag, water

1. **KWL: What I've Learned**
   a) Complete the K-W-L chart with the students. Review what students wanted to know and what they have learned about plants and animals on their visit to Shenandoah National Park.

   b) Have the students review the KWL sheets and the field journal pages and then complete the *How I Can Help* page in their journals. Have the students draw and write about one way they can help take care of Shenandoah National Park and the environment.

2. **The Salamander Room and Big Meadows**
   a) Read (or watch) the story *The Salamander Room* by Anne Mazer and Steve Johnson, about a young boy who is asked a series of questions by his mother when he announces that he wants to keep a salamander in his room. Focus the students' attention on why the boy is making specific changes to his room. Ask questions like "Why did the boy add leaves to his room?" and "Why does the salamander need water in the room?"
   b) Compare the story to what the students learned in Shenandoah National Park. Create a chart on the smartboard or blackboard for the class to complete.

	Salamander Room	Big Meadows
Sleep		
Play		
Friends		
Food		
Water		
Add more		

Tell the class "The boy in the story created a habitat for his salamander in his room but since we recently visited Shenandoah National Park, we already know that Big Meadows is a good habitat for living things." Have them think about the

animals they pretended to be in Big Meadows. Work as a class to fill in the chart comparing the story with what they found in Big Meadows.

Example: After reading about where the salamander will sleep, add "drawer" in the Salamander Room column. Ask "Where do animals sleep in Big Meadows?" Since Big Meadows is such a large and varied habitat, there may be several correct answers. Record student answers on the chart and repeat for the other actions.

c) Conclude by sharing how the boy had to create a habitat in his room for the salamander so it would have the things it needed to survive, but Shenandoah National Park already has the things that plants and animals need in their natural habitat. Remind students that all the plants and animals and their life needs are protected in the national park.

3. **Read *The Lorax*** by Dr. Seuss. The story teaches students about the need to take care of the Earth. Ask students to think about their visit to Shenandoah National Park and what kinds of things they can do to help protect Shenandoah National Park and the Earth. Start a recycling bin for paper, plastic, or juice boxes.

4. **Science Experiment: What Plants Need to Grow**
Lead a discussion by asking students "What do children need to grow?" Then ask students what they think plants might need to grow. Investigate the life needs of a plant and use observation skills to examine physical changes in plants.

   Each class will need: 6 identical plants (re-potted in paper cups), a marker, brown paper bag, and water. Label two of the plants with a sign - NO WATER. Put these two plants in a sunny window but do not water them.

   Label the next two plants - NO LIGHT. Place these plants away from sunlight. Water these plants then place a brown paper bag over them. Provide water to keep the soil damp throughout the experiment.

   Label the last two plants - WATER & LIGHT. Water these plants and place them in a sunny window. Provide water to keep the soil damp throughout the experiment.

   After two weeks, examine the plants. Ask students which plant is the healthiest. Why do you think that plant looked healthier than the others? What things do plants need to grow? How does Shenandoah National Park help plants grow? What can harm the plants in Shenandoah?

Unit Assessment

1. Observe and document student interaction, discussion, behavior changes, and written work.
2. Evaluate student journals including pictures and sentences based on effort and correct number of pre-determined and posted criteria.

3. Administer the Plant and Animal Detectives unit pre-visit/post-visit assessments and document student scores.

Going Further

1. Create your own outdoor classroom or Schoolyard Habitat. Have students research and learn about native plants and wildlife.

2. Make a small Big Meadows area
   Use a tabletop or tape off part of the floor of your classroom to represent the Big Meadow in Shenandoah National Park. Have students draw or create animals that might live in the meadow and decorate drawings or things that represent the features of the meadow habitat that the survival needs of the animals.

References and additional activities

2018 Science Standards of Learning Curriculum Framework, Virginia Department of Education, 2019
http://www.pen.k12.va.us/testing/sol/standards_docs/science/index.shtml

Oodles of Animals, Ehlert, Lois, Harcourt Children's Books, 2008.

The Salamander Room, Mazer, Anne and Johnson, Steve, Dragonfly Books, 1994.
https://www.youtube.com/watch?v=hZrtzCA9pmY

Garden for Wildlife: Schoolyard Habitats, National Wildlife Federation
http://www.nwf.org/schoolyard/

Good Character, Good Stewards, Caring for the World around Us, Shenandoah National Park, 2005
https://www.nps.gov/teachers/classrooms/good-character-good-stewards.htm

Science Fun You Can Eat – Parts of a Plant Salad, Learning Treasures
http://www.learningtreasures.com/plant_salad.htm

The Lorax, Dr. Seuss, Random House Books, 1971.

Pre-visit Activity #2 and Post-visit Activity #1

I Wonder KWL Chart

In the first column, write what you already know about plants and animals. In the second column, write what you want to know about plants and animals. **After** the field trip to Shenandoah National Park, write what you learned in the third column.

What I **K**now	What I **W**ant to Know	What I **L**earned

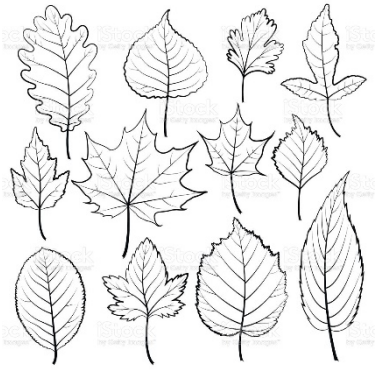
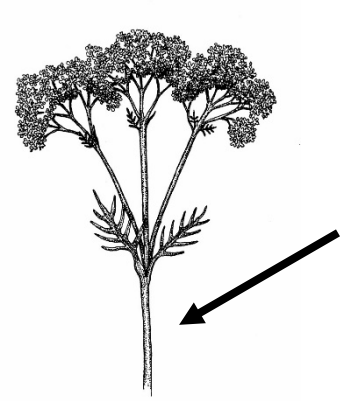
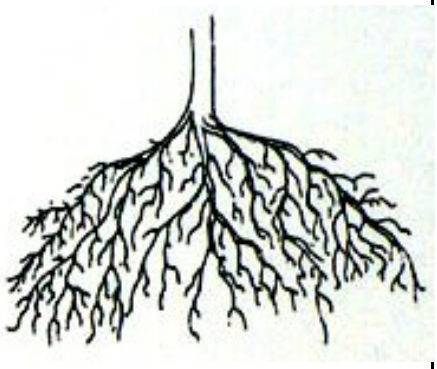
Shenandoah National Park

Student Field Journal

This journal belongs to: _____

Field Journal: Plant Parts Scavenger Hunt

Find these plant parts in the meadow. Circle each thing you find.

Leaf 	**Stem** 	**Bark** 
Cone 	**Flower** 	**Needles** 
Seed 	**Thorns** 	**Root** 

Field Journal: Animal Detectives Discovery Walk

Explore the meadow to find evidence of animals and their life needs. Draw what you discover.

Food	Water	Shelter
Leaves	Stream	Spider webs
Flowers	Puddles	Trees
Insects	Water on plants	Nests
Nuts	Pond (spring only)	A hole in the ground

↑Fill these empty boxes with other discoveries. ↑

Field Journal: My Shenandoah Animal

This is my animal in Shenandoah National Park:
This is my animal's shelter in Shenandoah National Park:
This is my animal's food in Shenandoah National Park:
This is my animal's water in Shenandoah National Park:

Field Journal: How I Can Help

Complete <u>after</u> your visit to Shenandoah National Park

Draw a picture of you **taking care** of Shenandoah National Park. Write some words and sentences describing what you drew.
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Plant and Animal Detectives On-site Backpack Activity Instructions

The in-park Plant and Animal Detectives program is usually done in the Big Meadows area, Byrd Visitor Center, Milepost 51 on Skyline Drive. The program will generally take a minimum of 2 hours. Divide the students into groups of 12 or less and assign chaperones and one backpack to each group. Complete the following activities using the student field journals made at school.

1. **Plant Part Scavenger Hunt**
   Time: 20 minutes
   Materials: hand lenses, *Plant Part Scavenger Hunt* journal page
   Basics: Students explore the meadow for different kinds of plants.
   Procedure: Have students complete a plant part scavenger hunt searching for flowers, bushes, and trees in the meadow. Remind students they are in a national park and should not pick or pull plants out of the ground. They should examine plants for roots, stems, leaves, flowers, and seeds. To see roots, look for tree roots above the ground. Gather the group and discuss student findings. What do plants need to survive? How do their structures help them stay alive?

   Safety message: *Please tell the students that some wild plants, leaves, nuts, and berries are poisonous to people. Animals can eat almost any kind of wild plant and not get sick, but people cannot!*

2. **Animal Detectives Discovery Walk**
   Time: 20 minutes
   Materials: hand lenses, *Animal Detectives Discovery Walk* journal page
   Basics: Students explore the meadow to search for things necessary for life.
   Procedure: Take a short walk through the meadow and use the *Animal Detectives Discovery Walk* page to record observations. Allow time to explore the meadow and the forest edge to search for evidence. After a 10-15 minute search, gather the students and ask each student to name at least one thing that they discovered in the meadow that would help an animal survive.

3. **My Animal In SNP**
   Time: 20 minutes
   Materials: Flagging strips, animal picture cards, *My Shenandoah Animal* journal page
   Basics: Students pretend to be animals living in Big Meadows.
   Procedure: Locate the flagging strips and animal picture cards inside the backpack. Use the flagging strips to mark four boundary corners in the meadow, approximately 30' X 30' square (to keep students and the teacher/chaperones within sight of each other). Have students work in pairs. Give each pair an animal picture card and have them imagine being that animal. How and where would they make their homes? Where would they get their food and water? Have pairs settle into imaginary homes inside the flagged designated boundary pretending to be their

animals. Have them complete the My Shenandoah Animal page in their journals.

Ask the students if they would like living in the meadow. Ask "What would happen if houses were built in or next to the meadow?" Move the boundary markers in 10 paces to simulate a shrinking habitat. Ask "Is there still enough space for everyone now? Could all of you still find everything you need to survive?" Remind the students that Shenandoah National Park helps to protect the habitats where animals live and meet their life needs.

***Note:** Please remember to remove the flagging strips and return them to the backpack upon completion of this activity.*

After the completion of your planned meadow activities, board the school bus and drive to the Big Meadows Amphitheater.

4. **The Raptor Rap (30 minutes)**
   Meet the park ranger at the amphitheater and take a closer look at one of Shenandoah National Park's common residents, either a hawk or an owl. What physical characteristics does the raptor have? How do these physical characteristics help the raptor meet its life needs? Where does it live? What does it eat? Why and how is it protected? The ranger will allow time for a student question and answer session.

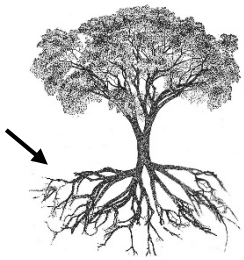
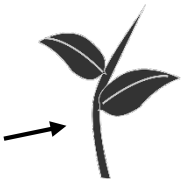
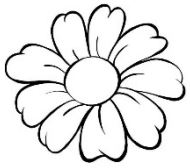
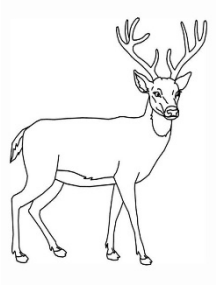
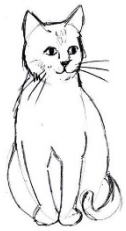
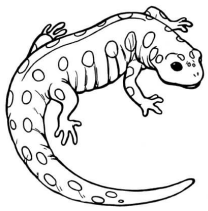
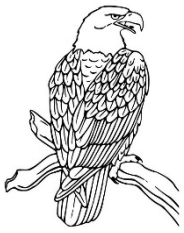
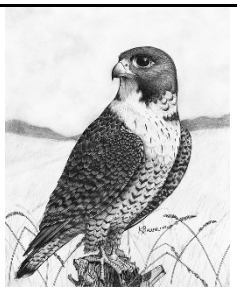
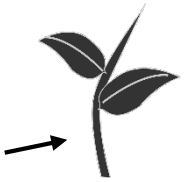
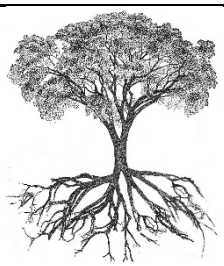
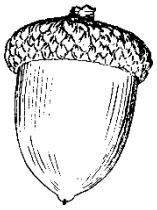
***Note**: If a raptor is unavailable, the following activity may be substituted for The Raptor Rap.*

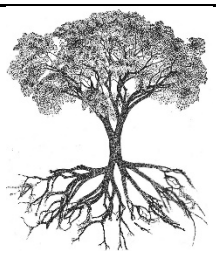
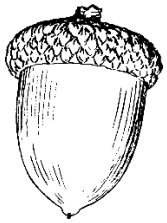
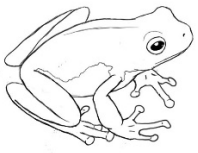
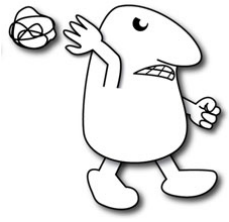
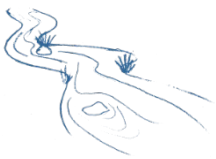
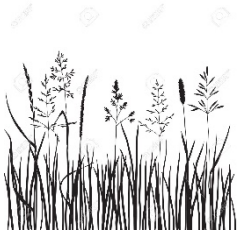
5. **The Mystery Box (30 minutes)**
   Divide students into groups of 12 or less. Choose a student to sit in front of each group and wear a blindfold. Give each blindfolded student a bag with a natural object from the Mystery Box inside it. Instruct the student to keep the object in the bag. Direct the other students to ask questions about the object. Example: Is it from a plant or animal? What shape is it? Does it feel rough or smooth? Ask the blindfolded student to use the sense of touch to answer the other students' questions. Have students guess the object. Repeat the game, as time allows, by rotating the objects between groups.

Shenandoah National Park Education Program

Plant and Animal Detectives
Pre- & Post-visit Assessment

Name_____ **Date**_____

1. Which plant part is below the soil?	 a. roots	 b. stem	 c. flower	 d. leaves
2. Which animal lives in Big Meadows?	 a. dog	 b. cow	 c. deer	 d. cat
3. Which animal is different from the others?	 a. salamander	 b. eagle	 c. owl	 d. falcon
4. A new plant grows from a _____.	 a. stem	 b. leaf	 c. root	 d. seed
5. Which animal lives in Shenandoah National Park?	 a. lion	 b. panda	 c. giraffe	 d. black bear

6. What plant part uses sunlight to make food?	 a. flower	 b. leaf	 c. root	 d. seed
7. What is the best way to observe animals?	 a. look quietly	 b. talk loudly	 c. cover your eyes	 d. run around
8. Which animal uses its feet to run?	 a. snake	 b. owl	 c. frog	 d. deer
9. How can you help protect Shenandoah National Park?	a. hunt in the park 	b. throw trash on the ground 	c. ride your dirt bike 	d. recycle your litter 
10. Which of these does a deer need to survive?	 a. water	 b. grass	 c. shelter	 d. All of these are needed

Plant and Animal Detectives
Pre- & Post-visit Assessment
Answer Key

1. What holds the plant in the soil?

   a. roots

2. Which animal lives in Big Meadows?

   c. deer

3. Which animal is different from the others?

   a. salamander

4. A new plant grows from a _____.

   d. seed

5. Which animal lives in Shenandoah National Park?

   d. bear

6. What plant part uses sunlight to make food?

   b. leaves

7. What is the best way to observe animals?

   a. look quietly

8. Which animal uses its feet to run?

   d. deer

9. How can you help protect Shenandoah National Park?

   d. recycle your litter

10. Which of these does a deer need to survive?

    d. All of these are needed