

Delaware Water Gap National Recreation Area

Three-Touch Field Trip Model

Topic: Plants

Background:

This three-touch model is designed for educators to use in the classroom pre and post visit to Delaware Water Gap National Recreation Area.

Objectives – Students will be able to:

- Compare and contrast differences in seed structures.
- Hypothesize and provide evidence to support their claim.
- Illustrate important physiological features of plants and discuss how they relate to the plant's growth and development.

NGSS:

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

Time:

- Classroom pre-activity – 45 minutes; to be completed prior to attending the guided field trip at Delaware Water Gap.
- Guided Field Trip with a Ranger – 2-3 hours.
- Classroom post activity – 45 minutes; class period with optional writing extension to be completed after visiting Delaware Water Gap.

Recommended Location in Park:

- Dingman's Falls
- Park Headquarters

Targeted Grade Level:

3rd – 6th grade

Below you will find the pre and post trip activities. Contact us to schedule your visit to Delaware Water Gap National Recreation Area and receive the supplementary documents file.

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Pre-visit Classroom Activity for Teacher – “Need for Seed” and “Let’s Branch Out”

Teacher Background:

Do this activity with your students prior to visiting Delaware Water Gap National Recreation Area.

Time:

45 minutes

Materials:

- Microscopes or magnifying glasses
 - Samples of seeds – recommend at least four types of seeds
 - Images of the mature plant that the seeds grow *to borrow our seed samples and images contact us by calling (570)426-2452 or email dewa_interpretation@nps.gov*
 - Petri dish for each type of seed
 - Supplementary Documents: Hemlock Tree Diagram, Vocab Terms, and Answer Key
- *Contact us to receive these downloadable supplementary materials*

Pre-Lesson Setup:

- Cut out the Vocab Terms and provide a complete set of those and a Hemlock Tree Image to each group of students. *Contact us to receive these downloadable supplementary materials*
- Collect samples of seeds from your local area and find an image of the plant that the seed grows into. (= *Contact us if you would like to borrow our samples and images*



- Place one species of seed in a petri dish and label the dish “A”. Continue labeling other petri dishes alphabetically and placing one type of seed in them.
- Print out supplementary documents: Hemlock Tree Image, Parts of the Tree Vocab Terms, and Answer Key.

Image 1: Example of how to set up seeds for activity

Prior Knowledge/Words to Know:

- **Botanist** – a scientist who studies plants, including flowering plants and plant-like things, such as moss and seaweed.
- **Microscope** – a scientific device that magnifies tiny objects or makes them look larger.

- **Species** – refers to a very specific group of similar living things. For example, the red fox is a different species from the grey fox.
- **Native Species** – any species native to an ecosystem. They evolved to survive in their current environment naturally.
- **Photosynthesis** – the process in which plants make their own food. Photosynthesis requires sunlight, chlorophyll found in leaves and needles, water, and carbon dioxide gas.
- **Glucose** – is a type of sugar that plants make during the process of photosynthesis and is their main form of energy.
- **Sapling** – a young tree with a slender trunk. Just like a young duck is called a “duckling”, a young tree is called a sapling.

Part 1: Teacher-Led “We’ve Got the Need, the Need for Seed”

At Delaware Water Gap National Recreation Area, there are over 1,500 different plant species. Most plants begin as seeds, which can come in a variety of shapes and sizes. Even 100-foot-tall hemlock trees begin their journey as seeds small enough to hold in your hand! Today, you will think like a botanist as you explore, observe, and discover how plants grow.

Objective (SWBAT):

- Compare and contrast differences in seed structures.
- Hypothesize and provide evidence to support their claim.

Directions:

1. On a blank sheet of paper have students create a data table like the one below. (Add or subtract rows based on number of seed samples.)

Seed Sample	Drawing	Observations	Hypothesis and Reasoning
A			
B			
C			
D			

2. Use a microscope or magnifying glass to observe the seed samples in the petri dishes labeled A, B, C, and D.
3. Take note of the distinguishing features of the seeds. For example, the size, shape, texture, and color.
4. Create drawings of the seeds and record your observations in your data table.
5. Look at the images of plants and make a hypothesis (educated prediction) about which seed grows into which plant.
6. Provide reasoning to support your prediction.

Discussion:

Show students what seed will grow into which plant. Discuss their results. Possible questions to consider: Were their hypotheses correct? What characteristics of the seed led to their decisions? Did anything surprise them? How can a small seed grow into such large plants? What do we need to grow? What does a tree need to grow? How are those things similar/different?

Part 2: Teacher-Led “Let’s Branch Out”

Have you ever had an adult tell you to “drink milk so you will grow big and strong?” Well, they aren’t wrong. Calcium in milk, and other nutrients in our foods help us grow strong bones. Have you ever wondered how a tree eats? You won’t see a tree at your favorite restaurant, and that is because they are able to make their own food. This complex process, call photosynthesis, happens inside the tree. While we can’t see it occurring, every part of the tree plays a role. As a botanist, it is important to understand how the different parts of a tree work together to create sugars, like glucose, which is food for trees.

Objective (SWBAT):

- Interpret how each part of the plant is vital for the plant’s growth and development.

Directions:

1. Before you is a picture of an Eastern Hemlock, the state tree of Pennsylvania.
2. Read about the tree parts on the vocab cards. Match each card to the appropriate arrow on the Hemlock Tree Diagram.
3. Check your answers with the answer key.

Reflection:

Option to have students record responses in a notebook or discuss as a whole class.

Every part of the tree has a specific job, but all the jobs are connected to help the tree grow and stay healthy. Every year on April 29th we celebrate Arbor Day, a day that we recognize the importance of trees and all that they provide. Reflect on what you have learned about trees so far and choose one of the following statements to respond to.

- Trees are important because...
- If I were a tree, I would want to live (in this location/habitat) because...
- I wish I were a tree because...
- If I were a tree, I would want to tell the world...

Post-visit Classroom Activity for Teacher – “Plant Powers”

Time:

45 minutes with additional optional writing enhancement

Materials:

- 3M Poster Paper, or regular printer paper (1-2 sheets per student)
- Markers/colored pencils/ crayons

Objective:

- Illustrate important physiological features of plants and discuss how they relate to the plant’s growth and development.

Teacher prompt/explanation:

Spider-Man has his webs. Thor has his hammer. The Hulk has super strength. But did you know that plants also have superpowers? At Delaware Water Gap, there are many plants with secret superpowers. Over time, humans have learned about these powers and how to use them to help heal diseases, create tools, and represent aspects of our cultures. For instance: High Bush Blueberry helps keep your heart healthy, White Ash Tree is used to make baseball bats, and American Holly is often used in Christmas wreaths.

Now, you will create your own species of plant with its very own special power. Think about how it would look, sound, feel, smell, taste. Through writing and illustration, describe your plant and its superpower.

Directions:

1. Brainstorm what superpower you want your plant to have.
2. Consider what structures or nutrients your plant would need to perform its power.
3. Create a drawing of your plant.
4. Label the parts of the plant.
5. Write a detailed description about your plant, what habitat would it live in, what makes it unique, what is its superpower, and how humans might use that superpower.
6. Give your plant a scientific name.

Optional Closure Prompts:

1. What are 3 things you learned at Delaware Water Gap?
2. What was your favorite part of the visit to the park?
3. What questions do you still have?

Post Visit Classroom Activity for Teacher – Optional Writing Enhancement: “Poet-tree”

Materials:

- Leaf cards printed on green paper
- Drawing of a tree trunk on large 3M Chart Paper or Chalk Board/Cry-Erase Board
- Tape to attach leaf cards
- Scissors to cut out leaf cards

Teacher Prompt/Explanation:

An important part of a botanist’s job is not only to collect and record data, but also to highlight the significance of the plants that they are studying. This can be done through creative writing, storytelling, and artwork. Today you will write a haiku, which is a style of poetry that is made up of three lines with a set number of syllables. A syllable is a word part that is like a beat of sound. An easy way to find syllables in a word is to clap each “beat” as you say words aloud. In a haiku, the first line has 5 syllables, second line has 7 syllables, and the third line has 5 syllables. Here are a few example haikus. Clap along as you read them:

Walk-ing through the woods (5)
Up the hill a-long the trail (7)
Al-ways leave no trace (5)

Wa-ter fall-ing down (5)
Ov-er cliffs, rocks, and bran-ches (7)
Al-ways mov-ing fast (5)

Directions:

Reflect on what you have learned about plants. Then, create a haiku about the plants or trees that you observed. Write several haikus and choose your favorite to write on a leaf card. Leaf cards can be printed on green paper, cut out, and then attached to an outline of a tree trunk to create a classroom poet-tree!



Image 2: Example of a “poet-tree”