

# Allegheny Portage Railroad

National Park Service  
U.S. Department of the Interior

Allegheny Portage Railroad  
National Historic Site



## Junior Girl Scout “Earth Connections” Badge



Your troop visit to Staple Bend Tunnel covers the following six elements for earning the badge:

1. Be an Ecologist: Your Study Area. Examine a study plot.
2. Reading the Rings. The secrets of tree stumps.
3. Eco-games. Learning to love your environment.
4. Saving Animals and Plants. Resource management.
5. Adapt or Perish. How plants and animals specialize.
6. Plants and People. What good are these plants around us?

# Your Ecosystem Study Area

We examined study plot \_\_\_\_\_

My partner(s): \_\_\_\_\_

We saw \_\_\_\_\_ different kinds of plants.

We saw \_\_\_\_\_ different kinds of animals.

Our study area did / did not have different levels of plant life, such as ground cover, shrubs, and trees. We think this was because

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Study temperatures:

_____	_____
_____	_____
_____	_____
_____	_____

# Tree Appreciation

From Sharing Nature with Children by Joseph Bharat Cornell

## Meet a Tree

This game is for groups of at least two. Pair off. Blindfold your partner and lead her through the woods to any tree that attracts you.

Help the “blind” scout to explore her tree and to feel its uniqueness. Ask her to rub her cheek on the bark. Ask her if she thinks the tree is still alive. Does the tree have a special smell? Can she put her arms around it? Is the tree older than she is? Can she find plants growing on it? Animal signs? Lichens? Insects? What other questions can you think of to help her explore the tree?

When your partner is finished exploring, lead her back to where you began, but take an indirect route. This part of the game has a fun side, with the guides leading their partners over imaginary logs and through brush that might easily have been avoided. Safety first! but have some fun with it.

Now, remove the blindfold and let the scout try to find her tree with her eyes open. After she does it is time for the other partner to be blindfolded and led to a tree...

## Heartbeat of a Tree

A tree is a living creature. It eats, rests, breathes, and circulates its “blood” much as we do. The heartbeat of a tree is a wonderful, crackling, gurgling flow of life.

Choose a tree that is at least six inches in diameter and has thin bark. Deciduous trees are generally better for listening to than conifers, and certain individuals of a species may have a louder heartbeat than others. Press a stethoscope firmly against the tree, keeping it motionless so as not to make interfering noises. You may have to try several different places on the tree trunk before you find a good listening spot.

# The Secret of the Rings

from *Tree Rings: Timekeepers of the Past* by DOI- Geological Survey

Botanists (scientists who study plants) and hydrologists (scientists who study geology and water) want to understand trees because their growth records give information about past conditions. They have discovered that trees are Nature's timekeepers, her historians.

Each year a tree usually forms a growth ring. You can see these rings in a tree stump when a tree is cut down. The thickness of a ring may be a record of climate conditions during that year of a tree's growth. A thin ring may mean extreme drought, for example.

Tree rings are also a record of plant history in a particular area. Trees that have grown up free of competition for sun and water have a pattern of large open ring growth, especially during the first years. Trees from a very competitive area will have narrow, closely compacted rings.

Tree-ring boundaries are distinguished as an abrupt change of appearance between the small thick-walled cells produced at the end of a growth season and the large thin-walled cells produced at the beginning or the next growth season. The wood between these two consecutive boundaries is formed during one growth season.

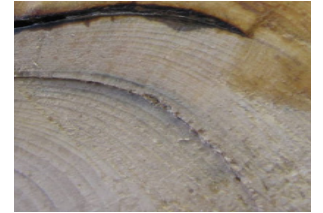
Because a single tree ring, a growth ring, is usually formed each year, the age of the tree when it was cut can be determined by counting the rings. If the year of cutting is known, the year during which each ring was formed can be determined by counting backwards from the outside ring. This process is called "dating."

If the same ring pattern can be identified in two pieces of wood, one of which has been dated, the second piece can be dated from the first by matching the ring pattern common to both pieces. This method is called cross dating. Scientists at the University of Arizona Laboratory of Tree-Ring Research have used this method to establish continuous ring records of more than 6,000 years! Cross dating has helped historians figure out the dates on wood used by settlers and even ancient Indian cliff dwellings.

# Reading the Rings

The University of Arizona Laboratory of Tree-Ring Research has made records and developed methods to read North American climate conditions of the past 400 years. Here are some tips for your own ring readings:

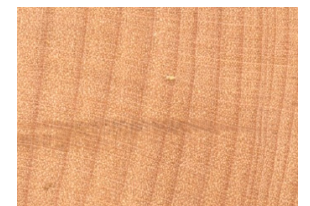
Ring boundaries of most nonporous wood (such as most evergreens) are the breaks between the line of darker colored cells and the much lighter colored wood just outside the dark band.



The ring boundary of ring porous woods (such as the oaks) is the break between the small thick-walled cells formed at the end of a growth season and the very large open vessels or pores formed at the beginning of the next season of growth.



It may be hard for your naked eye to see the ring boundary of diffuse porous wood (including maples, yellow poplars, and sycamores). It is the area between the fine light-colored lines formed at the end of the growth season by very small thick-walled cells.

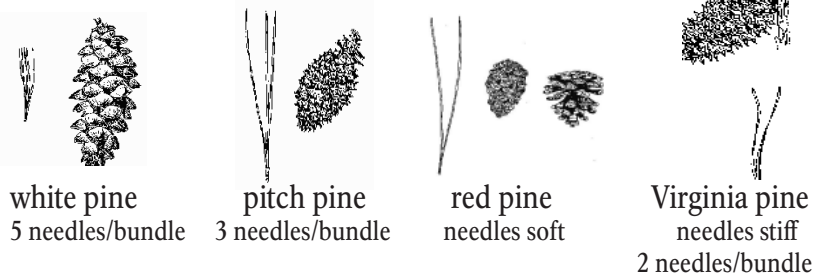


# What Kind of Tree

from the Pennsylvania DCNR Bureau of Forestry

## Needle-leaved Trees

Clue #1 - If the needles are in bundles it's:



Clue #2 - If the needles are not in bundles (single needles on twig):



## Broadleaf Trees

Clue #1 - Type of branching. Is it:



Opposite? go to clue #2



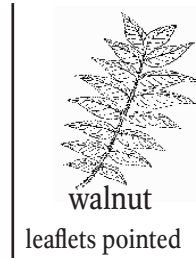
Alternate? go to clue #3

Clue #2 -Opposite -branch trees are: Maple, Ash, and Dogwood (MAD)

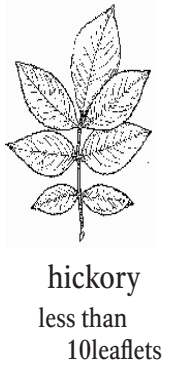
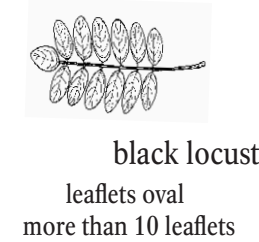


Clue #3 Alternate branched trees  
Simple leaves:

see below



Compound leaves:



Simple Leaves:

A. lobed- oak



B. Mitten-shaped: sassafras



C. Heart-shape: (basswood)

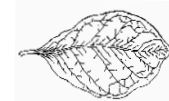


D. Blunt Tip: tulip poplar



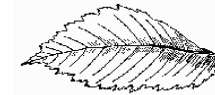
E. Maple-like: sycamore

F. No Teeth: Black Gum

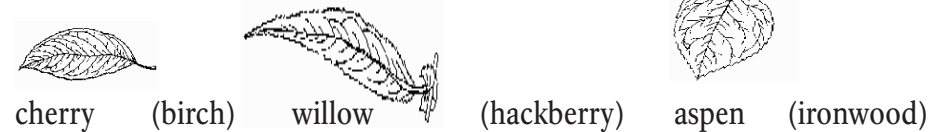


G. Coarse Teeth: long leaf: (chestnut) short leaf: (beech)

H. Double Toothed: Elm



I. Small Teeth



## The Un-Nature Trail

What did YOU see?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_

## Color My World

How many green toothpicks did you find?

How many red toothpicks did you find?

How many yellow toothpicks did you find?

Which were the easiest to find? \_\_\_\_\_

## The Un-Nature Trail

Before the scouts arrive, I have chosen a 40-to 50-foot section of trail and have placed 15 to 20 human made objects along it. Some of them should stand out brightly, like balloons or shiny metal spoons. Others should blend with their surroundings, making them more difficult to discover. The exact number of objects I've planted is a secret.

## Color My World

Doing the Activity

Sort the toothpicks by color.

Count how many of each color toothpicks.

Mix all the toothpicks together in a paper or plastic bag.

Distribute toothpicks randomly around an area. The size of area depends on the number of participants. The activity works best if there are a variety of surfaces such as grass, gravel, bushes and trees.

Reflecting

Which color toothpick did the group find the most? Why?

Which color toothpick did the group find the least? Why?

How would the location where the activity was done affect the outcome?

What are some animals where you live that are like the easy to find toothpicks? The hard to find toothpicks?

## Preserving the Scenery

Much of the work done by the natural resources staff at Allegheny Portage Railroad National Historic Site is “behind the scenes.” Park visitors rarely see the staff in action, and most give little or no thought to what jobs need to be done. To keep the park looking the way it did in historic times the natural resources staff has many duties. Among these duties are: studying and controlling invasive plants, studying and monitoring water and air quality, and making a list of the number and kinds of animals in the park.

### Invasive Plants

Plants that were not here in historic times change the scene from how it should be, and they often take over a large area keeping other plants from growing. Plants invading this area of Pennsylvania include:

Knotweed



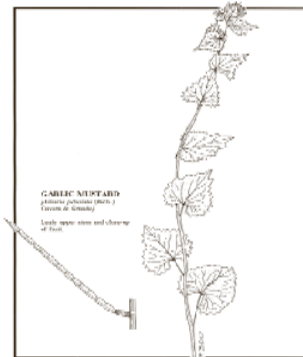
Bittersweet

Honey Suckle

Japanese Barberry

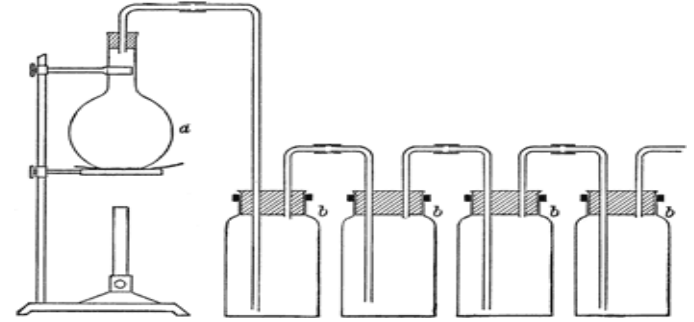
Multiflora Rose

Garlic Mustard



## Water Quality

The amount of water and what is dissolved in the water are important to the plants and animals of the park. Natural resources staff measure the pH, temperature, conductivity, dissolved oxygen, alkalinity, turbidity and flow of 8 different water sources in the park.



## Air Quality

Many things can affect the plants and animals in the park, none quite as important as air quality. Natural resources staff study acid rain, mercury and trace metals in the air itself, and even the amount of precipitation (rain or snow).



## Baseline Inventories

To understand what is happening with the park animals the staff must first know what animals are in the park and how they are doing. College students have studied the park butterfly and moth population and are currently looking at reptiles and amphibians. The natural resource staff wants to be certain conditions in the park do not change so much that the park animals suffer.



## Tunnel Dwellers

What kinds of animals do you expect inside a tunnel?

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What animals did you actually find?

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How are the tunnel animals different?

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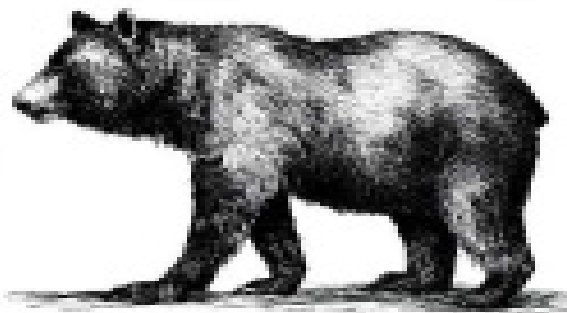
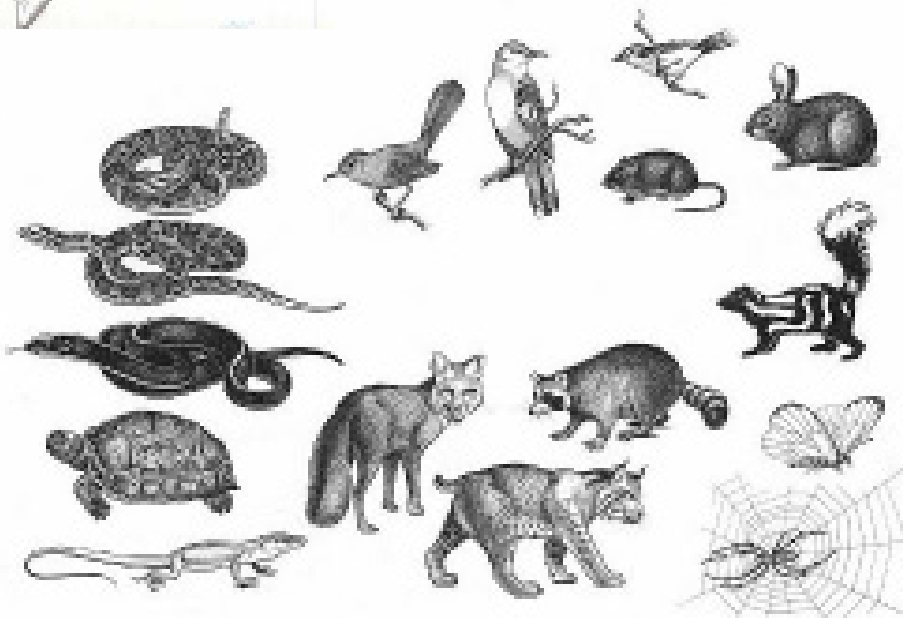
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## Native American Plant Use

White Oak- Indians made a flour from the acorns.

Eastern Hemlock- was a source of tannic acid for tanning leather.

Sassafras- oil from the roots, leaves, twigs, or fruit used for teas, medicines, perfumes.

Sweet Birch- bark and twigs distilled for oil used as a substitute for winter-green. Fermented sap used to make Birch Beer.

Paper Birch- used to make canoes, shelters, containers.

Black Oak- source of yellow dye for fibers.

Mockernut Hickory- source of black dye for fibers.

Shagbark Hickory- used for smoking meat, oil for cooking, bread flour made from the nut, branches used as bow wood.



## Modern Plant Use

Red Pine- planted extensively by Pennsylvania Bureau of Forestry for construction lumber.

American Larch- used for paper pulp, posts, railroad ties.

Buckeyes- used to make artificial limbs.

Black Gum- used to make boxes, railroad ties.

Bigtooth Aspen- used to make paper.

Quaking Aspen- used to make paper and cardboard.

American Elm- used to make boxes, barrels, furniture.

American Linden (also known as basswood)- used to make boxes, venetian blinds, sashes, doors, picture frames, and furniture.

Red Oak- used to make furniture, flooring, mill work, railroad ties, and veneer.

Sycamore- used to make furniture, butcher blocks, and flooring.

Black Locust- used to make posts, poles, railroad ties, mine timbers.

Black Walnut- used to make furniture, veneer, gun stocks and musical instruments.

