

# William S. Schmidt Outdoor Education Center



WOODLAND ECOLOGY- VILLAGES

## **Introduction**

**The Woodland Ecology lesson introduces the topic of forestry to students. It also shows the interconnectedness of the watershed, specifically the Chesapeake Bay watershed. In this lesson you and your group will stop at multiple stations to reinforce and learn new environmental concepts. This lesson is designed to suit student and educator preferences; feel free to explore additional topics of student interest and topics that have ties to classroom studies, and to skip stations that do not hold student interest. It is common that students want to spend more time on certain stations over others, especially depending on the season.**

**Thank you for your commitment to great environmental education!**

## **MWEE**

**This symbol stands for a direct connection to the Meaningful Watershed Educational Experience (MWEE). MWEEs ask students to explore local environmental issues through sustained, teacher supported programming that includes, but is not limited to, issue definition, outdoor field experiences, action projects, and sharing student-developed synthesis and conclusions with the school and community.**

## STATION #1

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# Composting

Composting is made up of organic matter usually consisting of leaves, grass clippings, vegetable and fruit refuse, and coffee grounds. Other organic matter such as meat, dairy, and bread should not be added because it will attract mice and other four legged animals.

Questions to ask:

Why is compost a good thing?

- Compost reduces how much trash goes into landfills, therefore saving space
- Compost makes excellent organic fertilizer for a garden, enriching the soil with more nutrients

Student Action:

- Have the students add one handful of leaves to build up the compost pile. Read the temperature out to the students.

Extra Compost Facts: There are three temperature zones for compost.

Steady Zone: (80-100 ƒ) Bugs, worms, and microorganisms slowly break down the organic material

Active Zone: (100-130 ƒ) For most backyard piles this is the zone for quickest composting

Hot Zone: (130-160 ƒ) Only large piles can obtain these high temperatures, if you're not careful it can catch on fire!

## STATION #2

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## Common Native Trees

The trees native to the Coastal Plain of Maryland, where Prince George's County is located, include both deciduous and conifer trees.

Deciduous trees shed their leaves during the cold season and grow them back each spring.

Conifer trees have needles and cones, and most are evergreens.

### Questions to ask:

How much carbon dioxide do you think a tree can hold? (A: Approx. 48 pounds of carbon dioxide per year)

How much water do you think a tree can hold? (A: One large tree can hold 100 gallons)

Student Action:

- Using the tree logs near the sign, ask students to try and determine how old this tree was when it was cut by counting the tree rings.
- Ask students to identify deciduous and conifer trees as you walk to the next station. Why are trees important?

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## STATION #3

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## Soil Pit/Super Soils

Ask students: what do plants need to grow? (A: water, sunlight, air, soil) Plants also need nutrients, which they obtain through the soil. Different plants have different nutrient and soil needs. We are going to find out what kind of soil Camp Schmidt has.

Additional questions to ask:

What kinds of organisms might live in the soil at Camp Schmidt?

(A: worms, bugs, bacteria, fungi, etc)

Why is it important to know the soil type of an area?

(A: We can understand why plants grow in an area, we can grow food)

Student Action:

- Allow students to observe the jars which have three different soil types. Ask them to provide descriptive words for each soil type.
- Have the students get into pairs, then give one soil sample tool to each pair of students. Have students dig in the soil pit and take a small sample of dirt. Tell them to avoid picking up leaves or other debris in their sample.
- Ask students to compare the soil they collected to the soil samples shown before. Form a hypothesis on what type of soil Camp Schmidt has. (A: mostly clay soil- a mixture of clay and silt)

## STATION #4

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# Bug Hotel

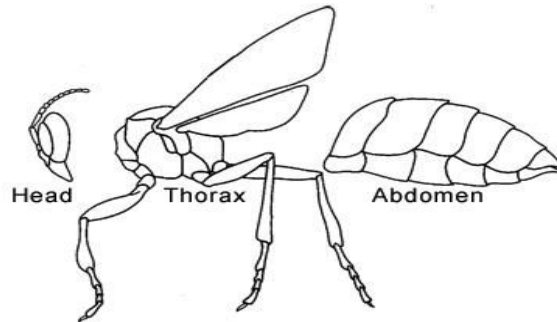
Insects are very important to the ecosystem! Why do you think a bug would prefer to make their shelter here? The Bug Hotel is the perfect place for different types of insects to live. Several different types of insects need this type of habitat, enclosed spaces, where they can protect themselves.

Questions to ask:

What are the body parts of an insect? (A: See picture below)

What types of insects would live in a Bug Hotel? (A: Beetles, bees,

What are pollinators, and why are they important? (A: pollinators help grow food and flowers)



Student Action:

- **WARNING:** Do not disturb any nests or bugs in hotel! Have students **carefully** add organic material to the Bug Hotel- i.e. leaves, sticks, needles, cones, etc. Explain that this material provides additional shelter for the insects in the Hotel.

## STATION #5

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# Tree Detectives

Ask students: Do you know how to tell one kind of tree from another? Brainstorm a list, using the signs as visual aids. Like animals, trees have different habitats and need varying levels or types of sunlight, water, soil, and space. Students will become Tree Detectives and study trees in detail.

Questions to ask as students are identifying:

- What wildlife might depend on the trees in this area? (A: squirrels, deer, birds, etc)

Student Action:

- Ask students to find a partner. With their partner, tell them to find at least three different kinds of leaves **on the ground only** and share their best descriptions. Students can compare their leaves to the pictures on the signs to see if they match. **Do not allow students to pick leaves from trees.**

Group Discussion Questions:

Which trees are younger or older? (A: Older trees are larger) Why do you think tree identification can be useful? (A: Helps to evaluate the health of the forest, the kind of habitat available, the different trees present, the kinds of trees certain animals use, etc.) How do you think trees help the watershed? (A: Trees can store water, trees can filter pollutants, and trees help prevent erosion by using their roots).

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## STATION #6

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# Layers of the Forest (Gap Dynamics)

Review the information on the Layers of the Forest sign. **Gap Dynamics** is the pattern of plant growth that occurs in an opening after a large tree falls in the canopy. Gaps lead to **microclimates**, which are small zones where the climate differs from the surrounding area.

Student Action:

Gap Dynamics Balancing Game: Students will mimic competing plants that have found a gap in the canopy of their forest. They want to outcompete the other organisms in their area to grow as tall as they can.

- Gather the students into groups of four.
- Have one group stand inside the hula hoop, close together in a small circle facing inwards.
- Have students stand with their feet together, like a tree, and press the palms of their hands to the person across from them. **NO INTERLOCKING FINGERS, ONLY PALMS ARE TOUCHING.**
- Have the other students stand around the group in the hula hoop, acting as safety spotters. These students will catch any falling students.
- Give the students a countdown from 5, and at 0 the students will try to unbalance their partner and push them out of the hula hoop using **only** their palms. If a student moves their feet, they are disqualified. Have the last two students compete against each other, and the last person standing in the hula hoop wins.
- Rotate groups so everyone has a chance to play.

**WARNING:** be aware of your surroundings, including sticks and large branches, which students could potentially fall on. Be sure to have student safety spotters ready before beginning.



## STATION #7

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## SNAG/Decomposition

Decomposition is the process by which organic material is broken down into simpler forms of matter. The process is essential for recycling the matter that occupies physical space in forests. Bodies of living organisms begin to decompose shortly after death.

Questions to ask:

What causes decomposition?

(A: Bacteria and fungi feeding on the remaining organic matter.

Worms are also good decomposers)

Why is decomposition a good thing?

(A: It removes all dead es and cones, and most are evergreens.ach

Spring.es.rassy meadows giving way to shurbs material)

Student Action:

- Have students locate something that is decomposing in the woods.

## STATION #8

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# Habitat Hunt/Nice Niche

What is a habitat? Habitats are made of three main components- food, water, and shelter. Students will be finding natural materials in the surrounding area to build replicas of their assigned animal's shelter. Shelter examples are shown on the next page. **WARNING:** Tell students to not harm animals or existing shelters while gathering materials. Ask students to **NOT** use any feathers or any already-made bird nests.

Divide students into groups of 3-4.  
Assign each group an animal:

- White-tailed deer
- Red-tailed hawk
- Black widow
- Black rat snake

Tell students to be creative with their shelters.

Student Action:

- Give students **10 minutes** to build their shelters
- **DO NOT** allow students to use oversize logs that are dangerous
- When finished, have groups explain and share their shelter to the rest of the group
- Have each group dismantle their shelter before leaving.

### Group Discussion Questions:

Do all the animals share the same type of shelter? (A: no) Do all the animals share the same habitat? (A: yes, the forest) Which materials overlapped with the different shelters, aka what types of materials were used multiple times? Explain the concept of ecological niche: Each animal has a role in the ecosystem, called their ecological niche. The niche includes the animal's role in the food web, how it gathers its food, how it contributes to the ecosystem, and more. The connections and overlaps in the niches illustrate the interdependency of webs in the ecosystem.

White-tailed deer shelter



Red-tailed hawk shelter (students should build nest on ground)



Black widow shelter (students must be creative)



Black rat snake shelter



## STATION #9

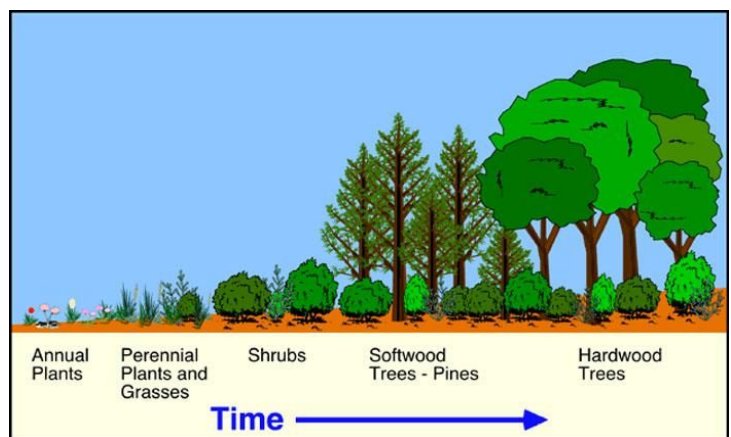
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# Succession

**No-Mow Zone:** This area allows for trees to reestablish an area over time. Eventually a forest will take hold, creating habitat for many animals.

Forest succession is a predictable series of changes in vegetation, such as grassy meadows giving way to shrubs and small trees, which are later replaced by taller, long-lived tree species.



Student Action:

- Have the students locate the two forests in front of the No-Mow Zone: The small trees near the road and the larger trees in back of the small trees.
- Ask students, What will the No-Mow Zone look like in ten years? (A: it will be populated with small trees)

## STATION #10

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# Butterfly/ Rain Garden

Ask students what they know about rain gardens or butterfly gardens.

Rain gardens help reduce pollution that would go into the Chesapeake Bay. Instead of rain water carrying pollutants into streams, the water is diverted into the rain garden.

Butterfly gardens have specific plants in them so butterflies can survive.

Student Action:

- Have students explore the butterfly rain garden and read the signs surrounding the area.
- Have students check the rain gauge. If low or empty, have students use the watering cans to water the garden. Obtain the water from the rain barrels or the hose nearby.
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