

GRADE FIVE FOREST ECOSYSTEM NATURE WALK

Teacher

- Send note home with students recommending long pants be worn for walk to prevent exposure to poison ivy.
- Complete “Before Going Out” work.
- Divide class into groups of 3-4 for walk.
- Complete “Back In Classroom” activities.

Walk Overview

Logistics:

- **Time:** 45 minutes
- **When:** In spring.
- **Groups:** Groups with 3-4 students.
- **Sites:** Choose any area with rotting logs, water, a dry spot for students to work. Some suggestions include 1) Bridge #1 into woods, 2) bridge #2 in Woods, 3) bridge #3 furthest in woods 4) ?? corner of the playground near rear parking lot 5) ditch in front of school
- Schedule parents. Copies of walk are in storeroom.
- Ensure no overlaps with other classes by checking the schedule outside the BBB office. Update BBB schedule with class time by writing Time/Grade/Teacher in correct date.

Materials from storeroom:

- Tongue depressors labeled *air, minerals, water, sunlight, warmth* 1 set/group
- Tongue depressors labeled *producer, consumer, decomposer*- 1 set/group
- Hand lenses, 2-3/group
- Clipboard, pencil, paper, and Ecosystem Worksheets 1, and 2.. 1 set/student.

Objectives:

- Explore and observe all layers of the forest community from rotting logs to nests in trees.
- Demonstrate some understanding of what plants need to produce its food, called ***photosynthesis***.
- Understand that plants produce the food they need to live and grow entirely from non-living things.
- Demonstrate some understanding of the words ***producer, consumer, and decomposer***.
- Discover that food/energy travels in a cycle.
- Realize that the ecosystem they have observed and described is a constantly changing system of plants, animals, and fungi interacting with each other and with non-living environment.
- Realize that everything is dependent on everything else and that they are a part of this web.

Activities:

- Explore and record in a forest ecosystem.
- Identify ***producers, consumers, and decomposers and nonliving*** elements of the forest ecosystem.
- Construct forest food chains.
- Complete Ecosystem worksheets 1 and 2.

Questions/Comments?

Please contact the current PTA Big Backyard Coordinator(s)

GRADE FIVE FOREST ECOSYSTEM NATURE WALK

Before going out (Teacher)

1. Ask students what different habitats they have at Bowman School (Ball field, open grassy area, edge areas, brook and wetlands, and woods.)
What do they know about a forest community? Build on their ideas about trees, forests, what plants need to live and grow, and what animals might live in a forest. They are going on a Nature Walk to study Bowman's forest.
2. Review what students already understand about *photosynthesis*, stressing that scientists call plants **PRODUCERS** because plants produce their own food for the energy they need to live and grow. Plants use the *sun's energy* to make food from *water, minerals, and air (carbon dioxide and oxygen)*. They can only do this when it is *warm*.
3. Introduce or review the words **CONSUMER** and **DECOMPOSER**.
First level consumers are animals that eat plants for the energy they need to live and grow.
Second level consumers eat other animals for the energy they need. And yes, some animals eat *both* plants and animals. Which are people?
Decomposers are plants, fungi, and animals which feed on dead plant and animal material. In this process they turn dead plants and animals into nutrients in the soil that help new plants to grow.

Don't worry too much about children's mastery of these concepts; it's enough if they have been introduced to the words and have a beginning understanding of what they mean. The purpose of this Nature Walk is to explore and observe these processes at work in their world. It is important for children to observe processes first hand as a basis for understanding vocabulary words. Memorized definitions in a classroom have little meaning for children. Children will develop a beginning understanding of the word *ecosystem* during the Nature Walk.

An ecosystem is not just a place, it is the process of plants, animals, and fungi interacting with each other and with the non-living environment, and it is constantly changing.

Some useful definitions

Ecosystem: a natural unit composed of living and non-living components whose interactions result in a stable, self-perpetuating system. It is made up of communities of organisms which interact with one another and with the non-living constituents of the environment. The ecosystem can exist in one habitat: eg a rock pool, a slow moving stream, a freshwater pond. It is a dynamic system.

Habitat: specific localities each with a particular set of conditions and appropriately adapted community of organisms.

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Nature Walk

Walk with the students to a pre-selected site in or near the woods that has dry places for 3-4 students to sit and work near a rotting log.

Students should all have a copy of the ECOSYSTEM WORKSHEET 1. Once at your site have students complete the top section with Name/date/time/temperature/weather.

Introduce the tongue depressors **Producer, Consumer, and Decomposer.**

PRODUCERS

Review what students already understand about *photosynthesis*. What do plants need in order to produce their own food? Using tongue depressors as needed help students to identify what plants need to live and grow. Where do they find these things on their list? Do plants make food from things that are not living? Plants use the *sun's energy* to make food from *water, minerals, and air (carbon dioxide and oxygen)*. They can only do this when it is *warm*. Scientists call plants **producers** because plants produce their own food for the energy they need to live and grow.

Ask the students to identify and list on their worksheet the different **plant producers** they see at this site. If you don't know names, a description is fine.

- **Trees:** red and white oak (red oak has pointed lobes and white oak has rounded lobes), white pine (five needles), cherry, red maple, hickory, beech, buckthorn, dogwood, elm, and black birch. Many of these trees are very tall, so leaves on the ground may be a good way of differentiating them.
- **Shrubs:** Honeysuckle, wild rose, raspberries, and blackberries.
- **Wild flowers:** Jewelweed, large burdock leaves, the tiny pink flowers of smartweed, and the tall woody stalk of the wild lettuce plant. Look closer to the forest floor for other wildflowers. Ferns, mosses, Canada mayflower, goldenrod, grasses, partridge berry, dandelions, false Solomon seal, and club mosses all grow in these woods.
- **Vines:** Two vines are found through these woods, both on the ground and climbing trees, poison ivy and Virginia creeper. Poison Ivy berries are white and are often eaten by birds. Only people catch poison ivy.

CONSUMERS

Plants can turn non-living things into living plant cells so plants can grow and animals can then use plants for food. Can we do this? Can we take a deep breath, eat a spoonful of dirt, take a drink of water, stand in the sun and make our own food? Humans are not producers, but rather consumers.

Scientists call animals consumers because they consume living things for the energy they need to live, grow, and reproduce. Some animals eat plants; some animals eat other animals; some animals eat both plants and animals. What kind of animal are people?

First level consumers are animals that eat plants for the energy they need to live and grow.

Can the students see signs of animals that eat plants? (bark beetle tunnels, Rabbit droppings, chewed acorns, a pollinating insect visiting a flower, squirrel)

Second level consumers eat other animals for the energy they need. And yes, some animals eat **both** plants and animals. Which are people?

Have students **list signs of consumers** (animals) on their worksheet that they see in the area. Be alert for signs of animals: woodpecker holes, spider webs, nests, birds calling, ant hills, chewed acorns, leaves with holes eaten away, and animal scat. Children may discover a beetle on tree bark, a pollinating insect visiting a flower, a squirrel scampering up a tree, a bird in the sky, a nest in a tree.

What signs of animals do they have on their list? Encourage children also to list names of animals they know live in the woods even though they didn't see them or signs of them today: fox, deer, red and gray squirrels, owls, raccoons, chipmunks, skunks, snakes, eastern coyote, salamanders, wood frogs, white-footed mice. They will need these animals as examples of first and second level consumers for a following activity.

DECOMPOSERS

Turn over a rotting log and encourage children to explore underneath. Don't let them destroy the log; it is home to many plants and animals. You may find sow bugs, millipedes, earthworms, ants, ant eggs or ant larva, spiders or spider eggs, slugs, beetles, centipedes, fungus and white fungus filaments, and occasionally a salamander. You may want to put an interesting critter in a bug box for closer viewing.

Encourage children to talk about what is happening to a rotting log. Is it still firm and hard or soft and spongy? Why? Is it moist? Are there tunnels? Who made them? What do we call what is happening to this log? Encourage the observation that the fungi and mini- creatures they have found are **decomposers**.

- **Decomposing leaves**

Look around them at the leaves on the forest floor. Ask if children rake leaves at home in the fall. How big a pile do they make? Well, no one has raked here for a hundred years, why aren't the trees buried in leaves? Find the dead leaves that fell last fall. Where are the leaves that fell to the ground the year before, and the year before that? The year they were in kindergarten? Encourage children to explore the leaf litter digging through the layers to discover broken up leaves, tiny pieces of leaves, and eventually soil. What happened to the leaves? Have they decomposed? What have the leaves turned into? Does anyone have a compost pile at home? Why did the leaves decompose?

Where does dirt come from? Look at soil with a hand lens. Note particles of rock or sand as well as tiny plant particles. Soil is composed of minerals (broken down rocks) and decomposed once-living materials (humus). Where does soil go on their clipboard list? Do they have rocks and sand on their clipboard? What about the tiny animals living in the dirt?

- **Fungi**

Until recently, scientists thought that fungi were part of the Plant Kingdom, even though they are not green and they don't photosynthesize. Now scientists have put fungi in a separate Kingdom along with molds and yeast and mildew.

Fungi live on dead or dying organic material. Shelf fungi are found in the forest year round on dead or unhealthy trees; they are so named because they grow parallel to the ground like a shelf. Many kinds of toadstools appear for a brief period according to seasons and weather. A toadstool is the spore producing part of a fungus that grows under ground year round as white filaments. Fungi play an important role in decomposition.

Children may also notice a black growth on some cherry branches. This is a black fungus and will eventually kill the branch it is growing on.

- **Lichens.**

Lichens are a tiny plant always found in the forest. Lichens grow on trees, on rocks, on decomposing logs, and on poor soil. Lichens are a symbiotic combination of algae and a fungus growing together and totally dependent on each other. The fungus provides moisture and an anchor for the algae while the algae provide food through photosynthesis. Lichens on rocks produce a chemical that helps the rock decay, and they are also a decomposer on rotting logs. Children may remember the name lichen because the fungus and algae have a "liking" for each other. Lichens can be distinguished from moss by their gray-green color.

NON-LIVING THINGS

This is not a bad time to have children revisit the concepts of living and non-living and discuss among themselves the characteristics of living things. (Living things require energy to grow, take in oxygen, reproduce, excrete wastes, and die.) What about the web of the tent caterpillar or a spider? The larva and spider are alive, but the web is non-living!

What do have children written under non-living? (dirt, rocks, clouds, rain, sun, air, spider webs, etc) Ask questions as needed to help children pay attention to the non-living things in the forest environment.

Where do children put dead tree stumps or old brown leaves? Ask children to decide, but expect them to give reasons. Usually they end up under non-living. Some groups decide to create a sub-group under non-living called "once-living", and this is a fine idea if it comes from the children

Take a moment to make sure that all students have entries under each category on their ECOSYSTEM WORKSHEET 1.

FOOD CHAIN ACTIVITY.

How would we make out if there were no plants, just animals, sun, air, water, rocks? Would there be any animals at all if there were no plants? No, no food. Is it important to appreciate and take care of plants? And of the air, water, and dirt they need to live and grow?

- **Constructing a food chain**

Tell the group that they are now going to make a food chain. Have students volunteer for the following elements of the food chain and stand on the path in following order:

- *Non-living* (sun, water, air, and minerals),
- *Forest producers* (oak tree, fern, acorn, blackberry, jewelweed, whatever they choose as long as it grows in the forest),

- *Consumers that eats plants* (squirrels, deer, chipmunks, caterpillars),
- *Consumers that eat animals* (fox, owl, eastern coyote.)
- *Decomposers* (fungus, ants, lichens, sow bugs)

Review the food chain by naming all the elements and their role as *non-living, producer, consumer, or decomposer*. Is everything dependent on everything else? What happens to the fox if there is a drought and we take away water? What happens to the plants and animals when they die? What do the decomposers produce? (Nutrients or minerals in the soil.)

Take the hand of the decomposers and move them around in a circle to join the non-living things. Is this really a food circle rather than a food chain? Nature is a great recycler.

- **Student independent food chains**

Have the students create their own food chain on ECOSYSTEM WORKSHEET 2.

What they have been studying here is an **ecosystem**. *An ecosystem is not a place, it is the process of plants and animals interacting with each other and with the non-living environment, and it is constantly changing.* An ecosystem can be as small as a hole in a tree, or a small pond; it can be as big as a mountain range or the planet Earth. Whatever happens to one thing in an ecosystem affects everything else.

Return to the classroom.

Some useful definitions

Ecosystem: a natural unit composed of living and non-living components whose interactions result in a stable, self-perpetuating system. It is made up of communities of organisms which interact with one another and with the non-living constituents of the environment. The ecosystem can exist in one habitat: eg a rock pool, a slow moving stream, a freshwater pond. It is a dynamic system.

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ECOSYSTEM WORKSHEET 1

NAME _____ DATE _____

TIME OF DAY _____ TEMPERATURE _____

WEATHER _____

Describe the location of your ecosystem site. List all things you see in the forest ecosystem under on topic

(Remember your ecosystem goes down into the ground and up into the sky)

PRODUCERS

FIRST LEVEL CONSUMERS

SECOND LEVEL CONSUMERS

DECOMPOSERS

NON-LIVING

AND DRAW A PICTURE OF YOUR SITE BELOW

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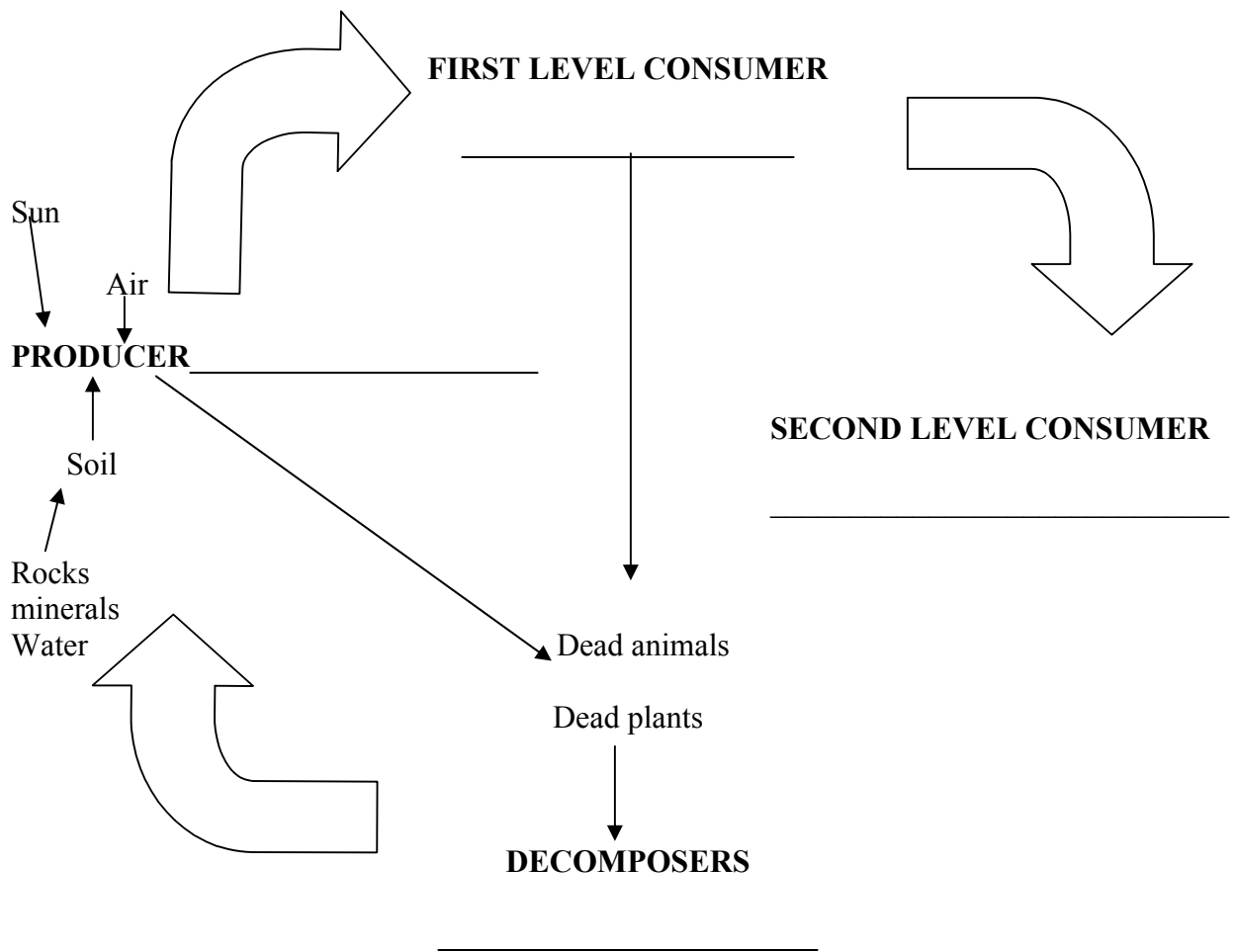
ECOSYSTEM WORKSHEET 2

Name _____

Date _____

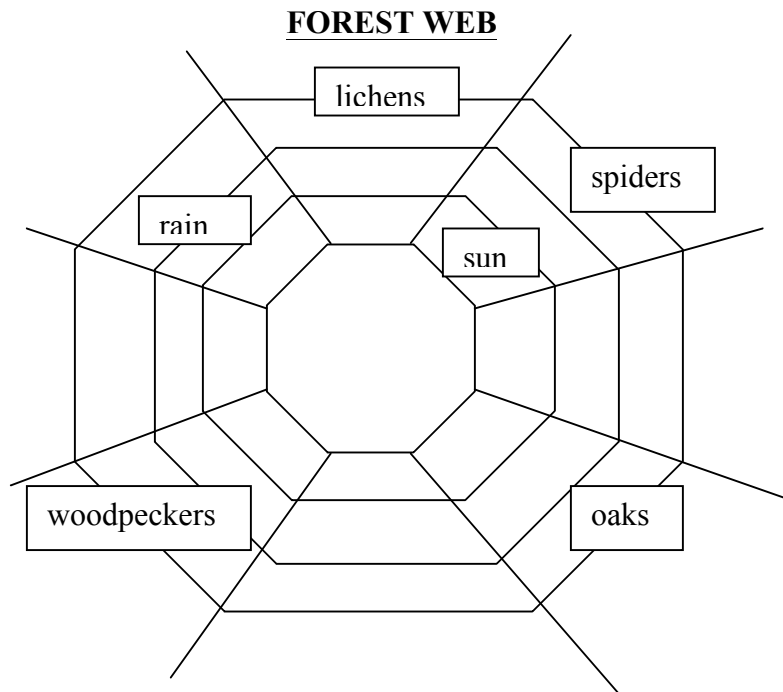
FOREST FOOD/ENERGY CYCLE

Make a food chain using forest plants and animals and connect the food chain with arrows.



Back in the classroom (Teacher)

1. Using the data students collected on their Nature Walk and their experiences and discussions outdoors, have students complete the Forest Ecosystem Worksheets 3. Students may work in pairs or small groups, but each student should complete the worksheets. After they have finished, go over the Worksheets as a class to pick up any misconceptions and assess student understanding of the concepts expressed by the vocabulary words.
2. As a class create a web describing the Forest Ecosystem. On black poster board or a classroom wall construct a web with white string. Have students put either drawings or labels on the web of everything they discovered in the forest. Discuss how all things in nature are connected and interdependent. Use the “Forest Web” for activity suggestions.



After making a Forest Ecosystem Web, ask each student to be something found in the forest. Using a ball of string, have students connect themselves with everything they interact with in the forest.

For example, the **squirrel** is connected with: Acorns and leaves to eat; Fox or owl which eats it; Trees it hides and nests in; Air it breathes; Decomposers after it dies

The **owl** is connected with: Tree it lives in; Mice or squirrel it eats; Air it breathes; Decomposers after it dies

The **tree** is connected with: Dirt, water, air, sunlight it needs to grow; Owl that lives there; Squirrel eats acorns and leaves and nests there; Decomposers after it dies

Once all the students are connected up, pull on one strand of the web. Who else is affected? Are all things in an ecosystem dependent on everything else?

GRADE FIVE FOREST ECOSYSTEM NATURE WALK

ECOSYSTEM WORKSHEET 3

Name _____

Date _____

An ecosystem is made up of:

1. Non-_____ Things

2. P _____

3. A _____

Plants make food from:

1. S __ 's Energy

2. A __

3. W _____

4. M _____

In a food chain:

Plants are called

1. P _____

Animals are called

2. C _____

Dead plants and animals
are eaten by

3. D _____

List at least three things found in the forest in each category:

Producers

Consumers

Decomposers