Gifts of the Forest

A ***Wood Magic Forest Fair*** Activity for 5th Graders

2019 Edition (Science standards highlighted in blue & CO2 sequestration highlighted in red)

Objective

Students will be able to describe several environmental, social, and economic benefits of our forests.

Overview

Students will explore what benefits forests provide for man and the environment; first in terms of wood products, then with regard to wildlife habitat, soil and water quality protection air and noise filtering, recreation, social benefits, and economic benefits (such as jobs).

Standards

5.E.3B.3 Construct scientific arguments to support claims that human activities (such as conservation efforts or pollution) affect the land and oceans of Earth.
5.L.4A.2 Obtain and communicate information to describe and compare the biotic factors (including individual organisms, populations, and communities) of different terrestrial and aquatic ecosystems.
5.L.4B.1 Analyze and interpret data to explain how organisms obtain their energy and classify an organisms as producers, consumers (including herbivore, carnivore, and omnivore), or decomposers (such as fungi and bacteria).
5.L.4B.2 Develop and use models of food chains and food webs to describe the flow of energy in an ecosystem.
5.L.4B.3 Construct explanations for how organisms interact with each other in an ecosystem (including predators and prey, and parasites and hosts).

Materials List

11" X 17" signs (plastic with stick-on letters) for the following categories:
WILDLIFE, SOIL & WATER PROTECTION, AIR FILTERS, JOBS, RECREATION
Several large gift-wrapped boxes.
2 wooden boxes – one with dirt only and one with moss or other vegetative cover
2 watering cans filled with water
air conditioner filter
fresh hardwood twig with branches
backpack
fishing pole
binoculars
forester gear (vest, hardhat)
deer antlers
2 glass jars
"Web of Life" supplies – several rolls of string, laminated cards labeled for each component of the forest – see appendix to this lesson plan for front and back of cards
3 dollar bills of any denomination

Preparation

Set up "Web of Life" in a large (15' diameter) circle. Cards are to be hung about 2 feet apart from a string that is about 3 feet above the ground (supported by stakes in the ground). The gift-wrapped boxes can be placed at the base of a pole or tree. The signs (categories, such as "WILDLIFE", etc.) are to be placed in a bag at the front of the teaching area.

Step-by-Step Instructions

1. Introduce yourself and ask them, "Who can tell me one thing you have learned so far today?"

2. Tell them, "I want to see how much you know about what we get from our forests. Who can raise their hand and tell me one thing we get from our forests?"

3. Call on several students before getting them to tell you what they all have in common. (Most, if not all, of what they list will be products made from wood or paper. All of them will probably be manufactured products.)

4. Say, "These are all products that we get from trees when they are harvested. Do forests provide anything when they are very young?" If they are stumped, ask them if they knew that deer [put deer antlers on your head] like clearcuts or very young forests for a place to rest, which is a limiting factor for deer. Have a child come to the front and hold up the sign that says, "WILDLIFE." Explain that trees, even before they are old enough or big enough to be made into paper or lumber, provide homes for wildlife.

5. Ask them what the signs said on the way to this station – "Gifts of the Forest." Explain that there are many "gifts" that the forest provides in addition to the products that we get from them later.

6. Have a student volunteer to come up and draw one of the gift signs out of the bag. Whichever one they pull out, lead a discussion on that one and have the volunteer child hold/wear the prop or do the experiment relating. Repeat this until all signs are drawn. See below for discussion points on each sign:

WILDLIFE

a. As a forest is growing wood to be harvested later, it is also providing homes for wildlife.
b. Each stage of succession – from 1-year old plantations to mature stands – the forest provides for the habitat needs of different species of wildlife.
c. Having different ages, types of trees, and "thickness" of forests is important in order to have what many different kinds of animals need – having just old trees isn't adequate.

SOIL AND WATER PROTECTION. Ask them how trees help in this, bringing out the following points:

a. Trees' leaves and branches intercept hard rain, softening its impact on soil. This help keep the topsoil in place playing a vital role in the soil's composition.

b. Trees' roots branch out in all directions, up to 4 times their height, holding soil in place like hundreds of tiny hands.

c. Holding soil keeps sediment out of streams (sediment can reduce the ability of fish to see their food and can limit the amount of sunlight available for photosynthesis).

Illustrate soil and water protection by pointing out the two wooden soil holders. "Which area do you think will hold the soil in place better when it rains?" [One with forest litter on it.] Pour water slowly over the bare soil, then over the forest litter – can be collected in a jar to compare (optional). "If you were a fish, would you rather live in a stream that runs through a forest or through a cleared lot? Your water would be a lot cleaner if trees were helping to hold the soil during hard rains.

AIR FILTERS. "Did you know that trees act like huge filters, trapping dust and smoke sort of like an air conditioner filter does [*show filter*]? Sometimes filters get clogged up. This can happen to a tree, also. If a tree's filters (leaves) get clogged up, it may die."

Ask "What do tree's give off that we breathe?"

Discuss the fact that trees take in and sequester, or hold onto, carbon dioxide and give off oxygen, and that they also filter other gases that are pollutants – like ozone and sulfur dioxide. Carbon dioxide is a natural greenhouse gas in the air that traps heat from the sun keeping our planet warm enough for life. CO2 concentrations in the atmosphere have increased as humans have burned more fossil fuels and cleared more forests and is causing the earth's temperature to rise. Trees store carbon by making it part of their living tissue. Forests and wood products, like the lumber that goes into the construction of a home, hold onto or sequester carbon keeping it out of the atmosphere.

Mention that something else that trees filter is noise. Have them think about a time when they were in a noisy room and then stepped around the corner. "It was a lot quieter on the other side of the wall, wasn't it? Trees act kind of like walls – they block noise from cars, noisy neighbors, or whatever."

RECREATION. Ask students what types of recreation someone could do in the woods (ex, fishing, camping, hiking, wildlife viewing, etc). **"**Raise your hand if you have ever been mountain biking, hiking, hunting, fishing, or camping. Think about how different it would have been if there had not been any trees in the park or forest where you did these things. Trees provide great places to have fun, and in the fall some folks hop in the car and drive to the mountains just to look at them! Trees make people feel better about themselves – I know I prefer to be in an area with a bunch of trees instead of somewhere where there aren't any."

Jobs. Say, "Let's think about the impact that forests have on our wallets." Pull out your wallet and drop a couple of bills from the air. "How many of you like to get money? Well, we need all need money for food and clothes and a lot of other things. Did you know that over 90,000 people in South Carolina rely on forests for their jobs. These people work in the forest (foresters, geologists, hydrologists, biologists) or in forest products manufacturing facilities." To help the students relate to the economic impact of forestry, have them think about a forester who works for a timber company. With her income she can buy a house, a car, food at the grocery store, clothing from the mall, etc. Have them consider how this person's spending affects dozens

of others – realtors, car salesmen, grocery clerks, etc. “So human activity can be beneficial in terms of jobs and also affect the land at the same time.”

8. Say, “Now, we’re going to play a game called, ‘Web of Life.’ “Let’s walk over to this circle. Everyone stand behind a card. Look at the back of the card and read what kind of an animal or plant you are. Then read what other animal or plant you need. Let’s start over here with _____ (child’s name).” Give them the end of the string and ask him/her what they need. Carry the roll of string with you to the other student, unrolling it as you go. Continue in this manner until all of the students are holding the string. Discuss with them how important all of the parts of the forest are and how they all depend on one another. Explain to them that foresters must consider more than just the trees when they are deciding what needs to be done in the forest. For example, sometimes they will thin a forest or prescribe burn it so more plants will grow that will provide food for deer or turkey.

9. Script for Web of Life:

a. **Student to Forest**: This omnivore needs the forest as the main oxygen source for survival. Oxygen is an abiotic factor needed for all organisms.
b**. Forest to Good Soil**: This terrestrial ecosystem, a forest, just one example of an individual community, needs good soil, this abiotic factor, as a means to grow healthy.
c. **Good soil to Sourwood**: Good soil is a combination of left overs from decomposers and other natural material from the trees. These items provide nutrients to the sourwood to remains strong in its population.
d. **Sourwood to Honey Bee**: Sourwood provides honey for the bee population to thrive. Without sourwoods, this limiting factor, the bee population would decrease rapidly.
e. **Honey Bee to Red Maple Tree**: Red Maple Trees are dependent on the honeybee to pollinate their trees.
f. **Red Maple Tree to Nature Photographer**: The red maple tree provides beautiful picture for the photographer before the leaves fall during the autumn season.

g. **Nature Photographer to Oak and Dogwood Trees**: Nature Photographers examine photos and classify trees by their characteristics.
h. **Oak and Dogwood Tree to Quail**: Oak and Dogwood Trees allow a quail to survive off the berries and acorns. Without these items, as known as a limiting factor, the quail would have to find another food source.
i. **Quail to Weeds and Grasses**: The quail also need a biotic factor in weeds and grass as a place to nest.
j. **Weeds and Grasses to Clean Stream**: These weeds are vital in stopping erosion and keeping dirt out of the water source, limiting factor, for all organisms in the forest.
k. **Clean Stream to Fish**: The clean streams act a natural home for fish. They are able to have offspring in this safe sheltered area.
l. **Fish to Bald Eagle**: The fish is the prey for this Bald Eagle, the predator. This is just one example of a small food chain.
m. **Bald Eagle to Mature Pine Forest**: The bald eagle, like all other biotic organisms needs shelter. The mature pine forest provides nesting areas.
n. **Mature Pine Forest to Leaf Litter**: Mature pine forest shed their pine needles and over time provides a leaf litter blanket for other organisms.

o. **Leaf Litter to Soil**: The natural progress of the leaf litter is to slowly decay in the forest. The process gives rich nutrients to the soils, an abiotic factor, which in turn allows plants and flowers to grow well.

p. **Soil to Deer**: Like all other organisms, the deer needs a nesting place, the shrubs and grasses (can also be producers), which grew in the soil provides this shelter to deer. Nesting places can be both abiotic and biotic factors.

q. **Deer to Wildlife Biologist**: This consumer needs scientists or Wildlife Biologists to study and maintain the area to ensure that food chains and food webs continue their natural process.

r. **Wildlife Biologist to Forest**: In addition to maintaining healthy wildlife populations, Wildlife Biologists also have to study all of the abiotic and biotic factors in the forest.

s. **Forest to Forester**: Forests need Foresters to ensure growth and health of the forest ecosystem.

t. **Forester to Tree:** The main objective of a Forester is to be able to identify and care for all the trees in the forest. This way, they allow the trees be producers in the food chains and food webs.

u. **Tree to Leaf:** The trees grow and produce leaves which photosynthesize, sequester carbon, and allows for clean air. Clean air is an abiotic factor which all organisms need to survive.

v. **Leaf to House:** Leaves also provide cool shade for animals and could also be use for camouflage for some insects and animals.

w. **House to Tree Product:** Houses are made from trees but also produce items commonly found in the grocery store.

x. **Tree Product to You:** We are consumers of producers, in this case, tree products.

Wrap-Up

Review with them the categories of the "gifts" of the forest - WILDLIFE, SOIL & WATER PROTECTION, AIR FILTERS, JOBS & RECREATION. Emphasize the fact that each of them has a higher quality of life because of these forest benefits, which are available to them while the trees are growing. Say, "So, forests are like factories – making a future product (lumber, paper, etc.). But, have you ever been to a factory that improves the environment, makes people feel better just by looking at it, or provides a home for wildlife in its buildings? And, remember, if we take care of trees and plant them back when we cut them, we can have all of these benefits – FOREVER!"