

Bioburgers

Wyoming Science

Objectives:

- Students learn the importance of water, air, sun and soil for life.
- Student draw connections between a common fast food and the four essential elements of life: air, water, sun, and soil.
- Students trace the ingredients of a hamburger to their origins.

Background:

Everything in the natural world is connected. An ecosystem is a community of living and non-living things that work together. Ecosystems have no particular size. An ecosystem can be as large as a desert or a lake or as small as a tree or a puddle. If you have a terrarium, that is an artificial ecosystem. The water, temperature, plants, animals, air, light, and soil all work together. If there isn't enough light, water or nutrients in the soil, the plants will die. If the plants die, animals that depend on them will die. If the animals that depend on the plants die, any animals that depends on those animals will die. Ecosystems in nature work the same way. All the parts work together to make a balanced system!

Life in a Lake

In a lake ecosystem, the sun hits the water and helps the algae grow. Algae produces oxygen for animals like fish, and provides food for microscopic animals. Small fish eat the microscopic animals, absorb oxygen with their gills and expel carbon dioxide, which plants then use to grow. If the algae disappeared, everything else would be impacted. Microscopic animals wouldn't have enough food, fish wouldn't have enough oxygen and plants would lose some of the carbon dioxide they need to grow.

Getting Down and Dirty

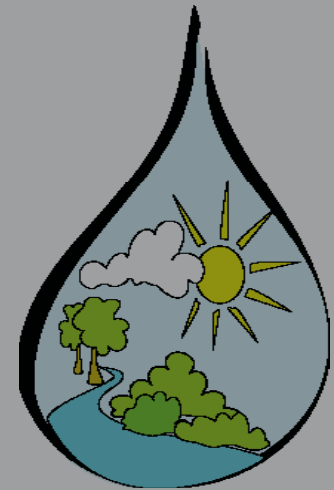
Soil is a critical part of an ecosystem. It provides important nutrients for the plants in an ecosystem. It helps anchor the plants to keep them in place. Soil absorbs and holds water for plants and animals to use and provides a home for lots of living organisms.



Standards

Science

Life Systems:
1.1, 1.2, 1.3



Materials

- Poster or sketch of a hamburger with bun, cheese, lettuce, and so on. (Order giant sized fabric hamburger from WAIC at Wyomingagclassroom.org)

Estimated Time

30 Minutes

Grades K-2

notes:

Give Me a Little Air

The atmosphere provides oxygen and carbon dioxide for the plants and animals in an ecosystem. The atmosphere also is part of the water cycle. Without the complex interactions and elements in the atmosphere, there would be no life at all!

Getting Some Sun

The heat and light from the sun are critical parts of an ecosystem. The sun's heat helps water evaporate and return to the atmosphere where it is cycled back into water. The heat also keeps plants and animals warm. Without light from the sun there would be no photosynthesis and plants wouldn't have the energy they need to make food.

Water Everywhere

Without water there would be no life. Water is a large percentage of the cells that make up all living organisms. In fact, you may have heard that humans can go longer without food than they can without water. It's true! Without water all life would die. In addition to being an important part of cells, water is also used by plants to carry and distribute the nutrients they need to survive.

As I Live and Breathe

Ecosystems have lots of different living organisms that interact with each other. The living organisms in an ecosystem can be divided into three categories: producers, consumers, and decomposers. They are all important parts of an ecosystem.

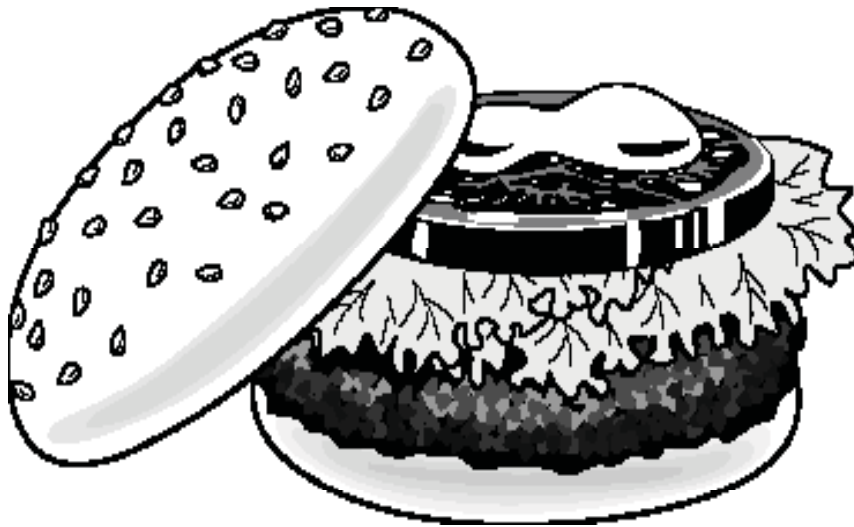
Producers are the green plants. They make their own food. Consumers are animals and they get their energy from the producers or from organisms that eat producers. There are three types of consumers: herbivores are animals that eat plants, carnivores are animals that eat herbivores and sometimes other carnivores, and omnivores are animals that eat plants and other animals. The third type of living organism in an ecosystem are the decomposers. Decomposers are plants and animals that break down dead plants and animals into organic materials that go back into the soil. Now we are back to where we started!

Activity Procedure:

1. Design a Food Flow Chart by taping the hamburger poster to the center of the chalkboard.
2. Help the students trace the origins of the major ingredients –meat, bun, cheese, tomato- of the hamburger. Begin by asking the students. "Where did the meat come from?"

Continue questioning until they reach the source of the ingredients: sun, soil, air, and water.

3. Record responses on the chalk board. Give guidance where needed. Your chart may be a simpler version of the one illustrated in this activity. Ask students:
 - How long could you live without any of the Big Four essentials of life?
 - Can you identify a living thing that can survive without the Big Four? (anaerobic bacteria; fish live without soil; some seaweed live without soil).
4. Ask students to plan a meal that does not in some way depend on the Big Four. Is this difficult?
5. Have each member of the class use his or her favorite meal and make a food flow chart tracing the food back to its beginning. Where does all the food ultimately come from?
6. Suggest that students try the same thing, tracing the package required at each step. Where does all of the packing come from? Where does it ultimately go?



Materials Adapted from "The Growing Classroom"

vocabulary:

- *ecosystem*
- *community*
- *nature*
- *oxygen*
- *carbon dioxide*
- *atmosphere*