DECOMPOSERS

Raccoon Creek Explorers Activity #19

Supplies:

- **2 glass jars (old jam jars or mason jars work great!)**
- **2 pieces of old fabric**
- **2 rubber bands**
- **compost or soil**
- **pieces of organic material like leaves, banana peels, bits of old fruits and veggies**
- **pieces of inorganic material like plastic or polystyrene (plastic utensils, straws and bits of Styrofoam cups or plates are perfect!)**

Time: About 5 days, or as long as you want!

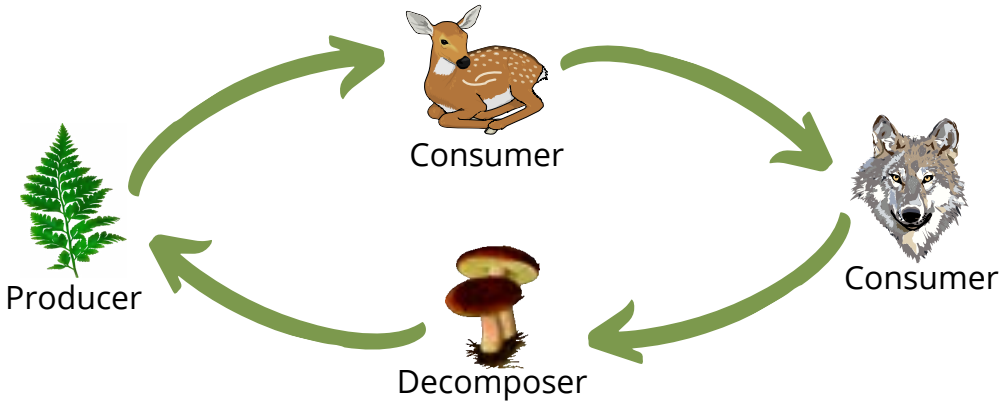
Vocabulary:

Biodegradable: able to be decomposed by bacteria or other living things
Consumer: an organism that gets it energy from other living things
Decomposer: an organism that decomposes non-living organic material
Decomposition: the process of rotting or decay
Detritivore: and animal that feeds on dead organic material
Food Chain: a series of organisms that depend on each other for food
Food Web: a system of food chains; all the food chains in an ecosystem
Inorganic: not created from living matter; man-made materials
Producer: an organisms that makes its own energy
Scavenger: an animal that feeds on dead animals rather than hunting.
Trophic Level: one of the three levels, or categories, of the food chain
Nutrients: a substance that provides nourishment essential for growth and life, like vitamins, minerals, protein, etc.
Organic: created from living matter

Background

You've probably heard that its important to recycle to keep our planet healthy and conserve resources, but did you know nature has its own recycling system? Organisms called detritivores feed on waste like dead plants and animals, recycling them into energy and nutrients. They're an important part of an ecosystem's food web. This web is made up of all the food chains in an ecosystem. A food chain refers to the path energy takes through an ecosystem. A food chain is made of three categories, called trophic levels. The first level includes producers. These organisms make their own energy, they don't rely on other organisms for food, and includes things like plants and algae. Producers are then eaten by members of the second level, the consumers. Consumers get their energy from other living things. This category includes all animals. The final level of the food web is the decomposers, who recycle dead plants and animals by consuming them and helping them decompose.

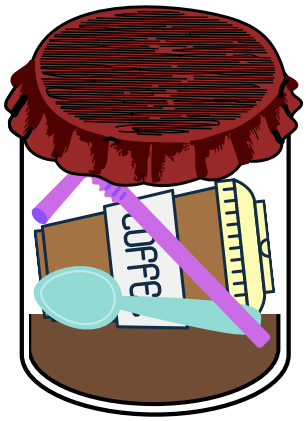
Sound complicated? Its no so bad! Plants use the sun's energy to grow. They're producers. Deer eat the plants, and wolves eat the deer. Both the wolf and deer are consumers. When the wolf or deer die, their remains are decomposed by insects, slugs, fungi and bacteria. These are decomposers. Bacteria return nutrients to the soil for more plants to use, the fungi and insects are eaten by turtles and birds, and the cycle keeps going!



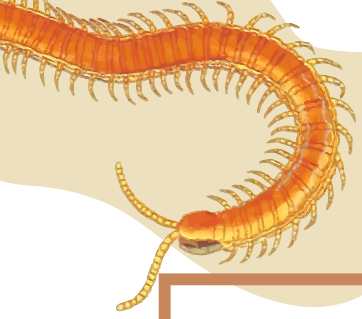
However, not everything can be decomposed and some things take a really long time to break down. We call things that can be broken down by bacteria and other living things biodegradable. Man-made materials like plastic and polystyrene take hundreds of years to decompose because not many organisms can feed on them. Therefore, they are nonbiodegradable. Lets do an experiment to see the difference in decomposition between organic, biodegradable materials and man-made, nonbiodegradable materials!

Lets Start!

1. Fill both jars with equal amounts of soil or compost.
2. Add your organic materials (things like banana peels, apple cores, paper and other food waste) to one jar. Then, add your inorganic materials (like plastic and Styrofoam) to the other jar.
3. Sprinkle a few drops of water in each jar. Not too much! We don't want it to be soupy!
4. Seal each jar by placing a piece of fabric over top and twisting a rubber band around the mouth of the jar to hold it in place.
5. Set the jars somewhere warm they won't be disturbed, like a windowsill or shelf, for at least 5 days. Watch to see what happens!



You should be able to watch the organic materials decompose, while the plastic and Styrofoam will look the same. This is because bacteria and fungi in the soil and air eat the food waste, causing it to rot and decompose. However, there aren't many organisms that can decompose inorganic materials like plastic. In fact, it takes hundred of years for most plastics to rot!



Apply:

1) Which things decomposed the fastest? Which were slowest?

2) What kind of decomposers can you spot around you in your daily life?

3) Do you think decomposers are gross or interesting?

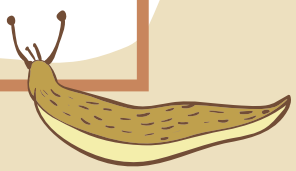
4)What could we do to help take care of our decomposers?

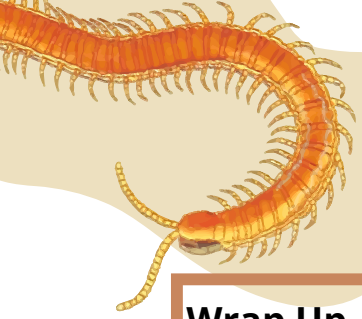
5) Are decomposers always helpful? When might we not want things to decompose?

6)Can you think of any alternatives you could use instead of plastic?

7)Do you think its possible to replace all nonbiodegradable materials with biodegradable ones? Why or why not?

8)Why is recycling man-made materials important?





Wrap Up

What would happen without decomposers? Dead leaves and fallen trees would pile up in the forest without ever rotting. Nutrients from plant and animal waste would never be returned to the soil to feed the plants. Plants would run out of the nutrients they need to grow, consumers would have nothing to eat, and the food web would collapse! It would be quite a problem! Not to mention all of the human trash that would pile up!

Thankfully, there are many different organisms that function as decomposers. Some examples include, bacteria, centipedes, slugs, snails, mold and mushrooms. Organisms called scavengers also help clear up and recycle waste. Scavengers eat dead animals rather than hunt for themselves. They are technically consumers, but they still help with decomposition! Classic examples of scavengers include vultures and crows, but many animals both hunt and scavenge for food, including bears, foxes, and raccoons.

Sometimes, decomposers are considered gross or icky, especially things like insects and molds, and some people may not like them. Many people find crows and vultures creepy! However, even when we don't like an organism, or think it's gross, its important to consider what role it plays in the ecosystem and how it helps us! We all have our part to play, and all of those parts are important!