Ecosystem: Student Activity Guide

Imagine you are really hungry and you have to share a meal with 2 other people. Or, what if you had to share it with 10 or 50 people? All living things have to share the food, water, shelter, and space available. Each thing necessary for life in a certain place is called a limiting factor. The amount of limiting factors available to share, limits how many organisms can live somewhere. When limiting factors run out, there can't be as many living things there. We are going to set up places for organisms to live and observe what happens because of some limiting factors. These places are called ecosystems.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- 3 Plastic Tall Cups
- 3 Soil Tablets
- Radish Seeds (If you have not done the virus activity, save the remaining seeds.)
- Medicine Cup
- Spoon (Will also be used in the virus activity.)

You Will Supply These Materials

- Water

Preparation:

For Part 1, set up two cup ecosystems. Follow the directions below.

1. Remove the mesh from the soil tablets and place one tablet in each cup. Add 30 mL of water.
2. After the water is absorbed, break apart the soil using a spoon.
3. Add an additional 10mL of water and mix.

Part 1: Limiting Factors

1. Put 4-5 radish seeds in a soil cup. Use the spoon to bury the seeds into the soil.
2. Put 40-50 radish seeds in another soil cup.
3. Over the next 14 days, sketch your ecosystem and write down your observations.
4. Make sure to water your plants when the soil feels dry.

Did you know that ecosystems have limits? Depending on those limits, each ecosystem can only support a certain amount of a specific organism. Changing the amount of a *limiting factor* can change how many animals and plants live in an ecosystem. Limiting factors include food, water, shelter, and space. There are other factors, too. For example, organisms can compete, eat each other, and get sick. These things can also change how many organisms live somewhere.

What are the limiting factors in the cup ecosystem? In the cup ecosystem, which limiting factor do you think matters most? Explain your answer. When comparing the two cup ecosystems, what other factors affect how many plants can grow?

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Part 2: Abiotic and Biotic Factors

1. Look at your soil cup that has 4-5 radish seeds between days 5-7, or when you see stem growth.
2. You have created an ecosystem within the cup. Think about all the factors that are part of that ecosystem. List all non-living and living things in your ecosystem.

Factors can be classified into two different categories: abiotic and biotic. *Abiotic* factors are nonliving parts of the environment and *biotic* factors are living parts of the environment. For example in a pond ecosystem, the Sun is an abiotic factor that helps provide plants with food. The living plants themselves are biotic factors that provide food to other organisms. Look at your list of non-living and living things and label them abiotic or biotic.

Place your cup outside. You have changed the ecosystem by doing this. List all of the abiotic and biotic factors. *What factors are the same, and what is new? How have your abiotic and biotic factors changed? If you planted your seeds in the ground outdoors, how would your abiotic and biotic factors change?*

Part 3: Ecosystem Investigation

In this part, you can create your own ecosystem. Using the remaining soil tablet, cup, and seeds, design an ecosystem where you change **one** limiting factor. Compare your ecosystem to the original soil cup ecosystems.

1. Decide which limiting factor you want to change.
2. Design and create your ecosystem.
3. Predict how changing that limiting factor will affect your ecosystem.
4. Over the next 14 days, sketch your ecosystem and write down your observations.
   How did your results compare to your prediction? How did changing your limiting factor impact the other limiting factors? Explain

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