Biome in a Baggie

Grade Level: 1, 2, 3, 4, 5, 6

Duration: 40-60 min

Classification: Classroom

Subject(s): Ecology, Biology, Environmental Science

Categories (STEM): Science

Keywords: Biome, Ecology, Habitat, Environment

Introduction

- Summary: This activity is an example of a miniature biome.
- Description: Students will learn what biomes are and how organisms use their environment to grow and receive nutrients.

Online Resource: https://www.childrens-museum.org/media/uploads/Eco-Boys-and-Girls-Science-Bites-2-Biome.pdf

Vocabulary

- **Biome**: A biome is a large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. Biomes are the world's major communities where insects, animals, plants and people live in a certain type of climate. All living things are closely related to their environment. Any change in one part of an environment, like an increase or decrease of a species of animal or plant, causes a ripple effect of change in through other parts of the environment. The climate and geography of an area determines what type of biome can exist in that region.
- **Habitat:** Home and environment of an organism.
- **Condensation:** Water vapor in the air changes into liquid.
- **Precipitation:** Rain, snow, hail, sleet.
- **Evaporation:** Liquid turning into vapor.
- **Soil:** Mixture of organic materials, clay, and rock particles for nutrients for plants to grow.
- **Terrarium:** a small closed or open container in which plants can be grown

Materials

Material	Quantity	Reusable?
Small see-through cups	1 per student	No
Gallon size Ziploc baggies	1 per student	Yes
Pebbles	Handful per student	No
Potting soil	Handful per student	
Seeds: grass, beans, whatever is available	A couple of seeds per student	No
Water	A cup per student	No
Large bowl/scoop	1 per bag of soil & pebbles	Yes

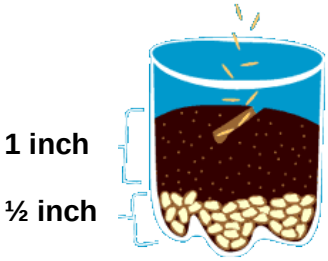
Directions

BEFORE STUDENTS ARRIVE

- Set out all supplies to easily pass out once students arrive

AFTER STUDENTS ARRIVE

- Go over vocabulary with students
- Ask some initial questions
    - Can you think of examples of different biomes and animals that are found there? (Commonly grouped biomes are: desert, deciduous forest, coniferous forest, arctic tundra, tropical rainforest, grasslands and taiga.)
- Go over with students that our biomes are being polluted and need to be protected. Over the past several years, human activity has destroyed, exploited, or polluted many of the biomes.
- Pass out materials for students
- First, pour pebbles into the bottom half of the cup. The pebbles should be about a half an inch deep.
- Then pour some soil over the pebbles. Your biome should have about twice as much soil as pebbles.
- Now, to plant the seeds. Make a trench down the center of the soil that's as deep as your fingernails. Sprinkle a pinch of seeds in the trench & cover it with soil.



- Water the soil just into you see the water collect at the bottom of the pebbles. This step is important. If you water too much your biome will flood. If you don't water enough your seed will not grow.
- Put the biome in a plastic bag and seal it. Make sure the biome baggie is labeled so it is clear which one is yours. Also make sure the bag is completely sealed.
- Put your biome in a sunny place and in about three to four days your plants should start growing. The cool thing about a biome in a baggie is that everything your plants need is

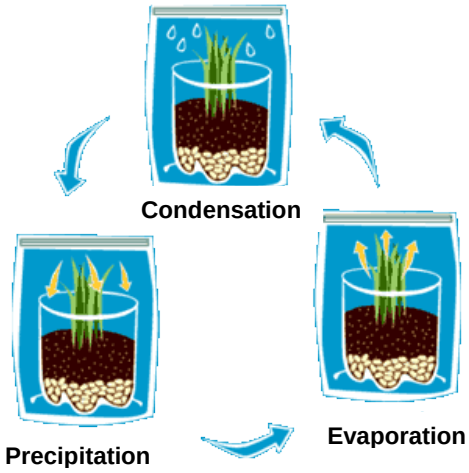
there. It has water, nutrients from the soil, air from the bag, and it makes food from the sun.

- Explain discussion questions & explanations

Activity Extension

- Activity word search

Discussion Questions



- Why don't you have to water your plants? (The students have created their very own environment for their plants. You won't need to water your seeds again because the water will recycle itself. The stems of the plant absorb the water and the water travels up the stem to all the parts of the plant. When the water gets to the leaves, some of it *evaporates*. Some water also *evaporates* from the soil. The evaporated water forms drops on the bag. This is called *condensation*. The condensation then falls back down to the ground, like rain. This is called *precipitation*. This is the water cycle-evaporation, condensation and precipitation.)
- What plants and animals do you share a biome with here in Iowa?
- How do you affect the other organisms like animals and plants living in your biome? How do they affect you?
- How are people destroying/changing biomes? Do you think it's worse or about the same destruction as 20 years ago? 100 years ago?
- What would happen if you place one biome in a closet without any light? Or place one near the window and another not in direct sunlight. Can you predict what would happen? Why? Can your plant live in your biome forever? Or would it run out of carbon dioxide? How long do you think your plant can stay alive in your biome?
- Can you name the biome you created? Where on the earth would it be located?
- How would you change your environment to symbolize a tundra, deciduous forest, rainforest and grassland?

What is happening?

- Students built their very own biome that is completely self-sufficient. Similar to a terrarium.
- This is an example of how plants and the water cycle work together for the plants to survive.

Applications:

- Majors
  - Environmental Engineering
  - Animal Ecology
  - Forestry
  - Environmental Science
  - Agricultural Engineering
- Jobs
  - Environmental Engineer
  - Forester
  - Environmental Scientist
  - Seed manufacturer
  - Seed Scientist
  - Agriculture Engineer
- Hobbies
  - Gardening
  - Terrarium making
  - Planting
- Real world applications
  - Biomes are important for understanding climate change and global warming
  - Botanical Gardens
  - Arboretums (botanical garden but only for trees)