Activity Title: Build Your Own Terrarium (K to Grade 4)

Recommended Grades

Kindergarten, Grade 1, Grade 2, Grade 3, Grade 4

Curriculum Connections

Matter

- K – examine properties of objects
- 3 – changes of state (water evaporation / condensation)

Earth Systems

- K – how environments can be explored, environments include plants, changes in environment can be observed, ways environment can be protected
- 1 – seasonal changes in plants, responsibility to care for environments
- 2 – components of Earth include plants, only planet known to support life
- 3 – activities which change Earth's surface, composition of soil
- 4 – Earth's systems interact, environments sustain life

Living Systems

- 1 – how do plants survive? (exist in all shapes and sizes, basic needs of plants, ways humans can meet needs and ways plants help humans)
- 2 – how do plants live and grow?
- 3 – plants responding to water, temperature, and light, plants depend on environment for survival

Computer Science

- K – instructions to be followed, have steps
- 1 – instructions to be followed, have steps

Time

15-20 minutes to build

Skills Focused On

• Creativity • Decision-making	• Observation • Resourcefulness

Materials Needed

- Glass jar with lid
- Soil – can be bought or collected
- Moss with material it was growing on – can be bought or collected
- Plant with roots – can be bought or collected
    - Examples: Polka Dot Plant, ferns, Nerve Plant, Spider Plant, African Violet
- Spoon
- Water
- *Optional:* Decorations! Rocks, pinecones, shells, plastic figures, etc

Background Information

What is an ecosystem? It is a community of living organisms living in an area and includes all the nonliving parts too, like rocks, water, etc.

A terrarium is a closed ecosystem, which means it doesn't need anything from the outside. The soil will release carbon dioxide that the plants will use in photosynthesis:

Light
Carbon dioxide + water —> Sugar (plant food) + oxygen

Light will enter the terrarium through the transparent or clear walls. Water is cycled through the system, as it evaporates from the soil and plants and then condenses on the walls of the container where it drips down into the soil to be used again.

You can build a terrarium of your own with a few simple materials.

Experimental Steps

1. Before collecting your plant, make sure:
    a. You have permission to collect in that area.
    b. You don't collect the last plant of that kind from an area.
    c. The root system is attached.
2. Remove any labels from your jar so that you can see inside.
3. Place at least an inch of soil in the bottom of the jar.
4. Take some moss that you bought or collected. Make sure that the moss has some of the material that it was growing on. Place it in the jar and use the spoon to place it where you want it. Make sure that the bottom of the moss has good soil contact.
5. Use the spoon to place your plant in the soil, making sure the roots are beneath the soil.
6. Continue to place your plants and moss as you want.
7. Add rocks or other decorations (optional).

8. Add enough water to the jar to dampen the soil. Add this in small amounts at a time. You don't want extra water sitting on top of the soil.
9. Place the jar in a sunny place, but not directly in the sun so that plants don't burn.
10. Once you find the right balance, you will not need to open your jar (other than to trim the plants if they get too large). Until you find that balance, you may need to occasionally open the jar and add a bit more water if the plants are starting to wilt.

Discussion/Experimental Extensions

Which plants grow best in your terrarium?

How does your plant respond to different amounts of sunlight, changes in temperature, and/or changes in moisture?

Do you notice water on the sides of your jar (condensation)? Why do you think this happens?

Experiment by making more terrariums with different jars, plants, etc. and compare your results to your first jar. What changed?

Additional Resources

If you want to expand this topic to talk about climate change and human disturbances, watch the video How Does A Peatland Breathe? | Energy At Home (https://youtu.be/OkzBUGBMYdA).

> Have you ever stepped, or sank, into a peatland? These unique ecosystems are important for storing greenhouse gases, but many disturbances, like oil and gas exploration, can impact them. Join Megan Schmidt, former University of Alberta student and current Master's student at the Wetland Soils and Greenhouse Gas Exchange Lab at the University of Waterloo, Ontario, as she introduces you to her field site where she studies how human activity influences greenhouse gas emissions from the peatland.

Alternative instructions: https://climatekids.nasa.gov/mini-garden/

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Learn more about Future Energy Systems (https://www.futureenergysystems.ca/) and access more learning content, including storytimes, lab tours, ask an experts and more (https://www.futureenergysystems.ca/engage/learning https://www.youtube.com/channel/UCJr8N9KyFJ6d-t36TPtUlwg).
Check out the Women in STEAM playlist: https://www.youtube.com/playlist?list=PLwhyRzP6sRaRPX8yerrVVDfxkbHnqDDgN.
Check out the Science playlist: https://www.youtube.com/playlist?list=PLwhyRzP6sRaRksOzDVBJ5VVBAH-09R-bJ
Check out the Environment playlist: https://www.youtube.com/playlist?list=PLwhyRzP6sRaQb1T7w3WNjx2wzsNvp-fiV
Check out the Renewable Energy playlist: https://www.youtube.com/playlist?list=PLwhyRzP6sRaQnhm1Z2oWSe1HYeX0vxVhl

Learn more about the Wetland Soils and Greenhouse Gas Exchange Lab: https://uwaterloo.ca/wetland-soils-and-greenhouse-gas-exchange-lab/#:~:text=Welcome%20to%20the%20Wetland%20Soils,soil%20properties%20in%20wetland%20ecosystems.