

A STEM in the Park

Take Home Activity

STEM

in the **PARK**™

Science, Technology, Engineering, and Mathematics



See How IT GROWS: Earth System in a Bottle

What You Need

- 1 rinsed 16 oz to 1 liter used plastic soda or water bottle
- 1 cup potting soil
- Six seeds (fast sprouting are best) or
- Plant for cuttings (hearty plants like mums or lavender, sage, usually work well)
- 1/4 - 1/8 cup water
- Scissors - to cut bottles
- Packing tape
- Ribbon to decorate planted bottle
- Newspaper for easy clean up

What To Do

- Cover your working area with newspaper for easy clean up.
- Ask an adult to help you cut the bottle in half.
- Make "wings" on each side of the top half of the bottle by making two 1 inch cuts (about 2 inches apart) on each side of the bottle top.
- Put about 1 cup of potting soil into the bottom half of the bottle.
- Water the soil by adding between 1/4 – 1/8 cups of water (soil should be moist throughout, but water should not "puddle"). If too much water is added, add more soil as needed.
- Add 3 – 6 seeds and/or a cutting from a hearty plant.
 - To plant the seeds, make a 1/4 inch deep hole using a pencil eraser. Add two seeds to each hole. Cover the hole with a "dusting" of soil.

Continued on back

- To plant a cutting, cut a plant stem on an angle at the desired length using sharp scissors. Simply bury the cut end of the plant into the soil about 1/4 inch deep.
- Put the top of the bottle onto the bottom half of the bottle with the “wings” of the top half inside the bottom and the rest of the top half on the outside of the bottom half of the bottle.
- Seal the top and bottom half together using packing tape.
- Decorate the bottle with ribbon.

Observe...

Observe the seeds/cuttings for several days to several weeks.

Investigate...

- Your bottle now represents the earth system. It consists of soil, water, plants, and air... just like the earth system does.
- Are all of these components of the system needed? Find out!
- Set up other bottles just like the first, EXCEPT delete one of the components from the system.
 - Set up a system without water
 - Set up a system without soil
 - Set up a system without plants
 - Set up a system without air (difficult.. but it can be done)!
- What did you learn about the components in the Earth System?
- Try other investigations, like:
 - Do plants grow better in composted soil or sand?
 - How much water is needed for the best plant growth?
 - What type of plant is best for cuttings?
 - Do plants grow best in normal air or air that has more carbon dioxide?
 - Can a pill bug live inside the earth system?
 - What happens to dead leaves inside the earth system?

For more on Earth System in a Bottle (activities, songs, story, role-play) visit Elementary GLOBE @ <https://www.globe.gov/web/elementary-globe/overview/earth-systems/learning-activities>

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