# Desktop Greenhouses

Plants require nutrients, water, air, and light to survive and grow. When growing outdoors, plants typically get nutrients from soil, water from rain, carbon dioxide and oxygen from the air surrounding them and from air pockets in the soil, and light from the sun. Light can also be provided by grow lights. Indoor farming is a method of growing crops entirely indoors. This method is particularly popular in urban areas where less land is available for growing crops or soil is contaminated.

**Materials**

- Desktop Greenhouses video
- 2 clear 16-ounce plastic cups with lids*
- 2 black 16-ounce plastic cups*
- Black electrical tape
- Black cardstock*
- mL measuring cup or ruler
- ⅛ teaspoon
- 2 Jiffy 7 peat pellets*
- Alfalfa or lettuce seeds*
- White 5mm LED*
- 3 volt lithium battery*
- Craft knife (with adult supervision)
- 2 labels
- Desktop Greenhouse Observation Sheets

*These items are included in the Desktop Greenhouses Mini Kit, which is available for purchase from agclassroomstore.com.

**Vocabulary**

**germinate:** to begin to grow

**grow light:** an artificial light source designed to stimulate plant growth by emitting a light appropriate for photosynthesis

**indoor farming:** a method of growing crops or plants, usually on a large scale, entirely indoors

**nutrients:** a substance that provides nourishment essential for growth and the maintenance of life

**photosynthesis:** the process by which green plants and certain other organisms transform light energy into chemical energy

**Activity**

1. Investigate the importance of light to plants by creating and observing a desktop greenhouse. Watch the Desktop Greenhouses video to view a tutorial on how to set up the greenhouses.

2. Label both clear plastic cups with the date and the type of seed you are planting. Label one cup with the number 1 and the other with the number 2.

3. Fill each of the cups with 50 mL of water or mark a line on each cup ¾ inch from the bottom and fill the cups up to the line with water.

4. Place a peat pellet, with the small hole facing up, into each of the cups of water. It takes about 15 minutes for the peat pellets to hydrate and expand.

5. When the peat pots are completely hydrated, use a pencil to loosen up the top ¼ inch of peat moss. Evenly spread ⅛ teaspoon of seeds on top of each of the peat pots. Press the seeds down gently with your finger so that they contact the damp peat.

6. Write the date and the type of seed you planted on two stickers and place one on each side of the black plastic cups. Label one of the black cups with the number 1 and the other with the number 2.

7. Complete your observations for Day 1 on the Desktop Greenhouse Observation Sheet.

8. For each lid, cut out a lid-sized disk from the black card stock, place it on top of the lid, and secure it with two layers of electrical tape so that no clear part of the lid is exposed (you may want to ask an adult for help).

9. Put the clear cups inside the black cups (be sure to match the numbers correctly 1 or 2) and place a prepared lid onto each of the greenhouses.

10. Place the greenhouses onto a countertop or table out of the way of direct sunlight. Allow time for the seeds to germinate in the dark greenhouses and check on their progress on Day 4. Do not open the greenhouses until Day 4.

11. On Day 4, check your greenhouses and complete the observations for Day 4. Note that the seeds did not need light to germinate (sprout). Most seeds germinate best in dark conditions. Seeds require the proper amount of warmth, moisture, and air to germinate.

12. Straddle the LED light's prongs around the 3-volt battery so that the longer prong is touching the positive sides of the battery.

13. Once the light is lit, hold the prongs in place by wrapping the electrical tape around the prongs and battery.

14. Ask an adult to use a craft knife and cut an X (similar to the straw X in the plastic lid) into the top of the greenhouse lid through the black cardstock disk and plastic lid for the greenhouse number 1 lid only. Do not cut an X for greenhouse number 2. Insert the light into the X on the greenhouse lid.

15. You will observe the plants for the next four days. Do you think you will see any difference between the plant growing in the greenhouse with the light and the plant in the dark greenhouse? If yes, what kinds of differences do you think you will see?

16. Record your observations each day for Days 5 through 8. On Day 8, record your conclusions on the observation sheet.