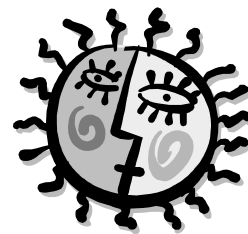




YOU LIGHT UP MY LIFE



BENCHMARKS and TASKS

SC.B.2.2.1 The student knows that some source of energy is needed for organisms to stay alive and grow.

SC.G.2.2.3 The student understands that changes in the habitat of an organism may be beneficial or harmful.

- The student compares plants grown under various environmental conditions such as different temperatures, amounts of light, types of soil, etc.
- The student classifies and justifies changes in the habitat of an organism as beneficial or harmful.

KEY QUESTION

How does light affect the way plants grow?

BACKGROUND INFORMATION

Plants are affected by many environmental factors. Plants grow towards **light**. This movement is called phototropism (photo means light and tropism means movement). A buildup of a chemical, auxin, on the dark side of the stems causes cells to grow longer on the dark side. This forces the stem to bend toward light.

Seeds remain dormant until conditions are right for them to sprout. Different plants need different temperatures to grow. For example, bean seeds require warmth to grow. Few seeds sprout during the fall and winter months. Most lay dormant during the cold months of the year. They start to grow when the ground warms.

Plants **adapt** themselves to their **environment**. An example is the Venus flytrap plant. It grows in boggy areas that are nitrogen-poor. It traps and digests insects to supply the nitrogen that its environment does not provide. Dandelions and cacti are examples of other plants that have adapted to their environment.

KEY QUESTION

How does light affect the way plants grow?

MATERIALS

Per group

1 shoebox with lid
1 paper cup (must fit inside the shoe box)
3 pinto beans
potting soil
cardboard strips

Per class

chart paper and markers
1 potted plant
1 spray bottle or mister

scissors
tape
water

Per student
science journal

TEACHING TIPS

1. This lesson will take place over a period of time.
2. Write *Environmental Factors* at the top of one page of chart paper. Then divide the page in half vertically and label the columns *healthy plants* and *unhealthy plants*. Save the chart to use as a reference during the entire plant activity.

ENGAGE

1. Take the class on a walk around the campus. Have students observe plants that appear to be unhealthy or dead. Be sure they also observe plants that appear to be healthy and thriving.
2. Back in the classroom, record student responses on the *Environmental Factors* chart.

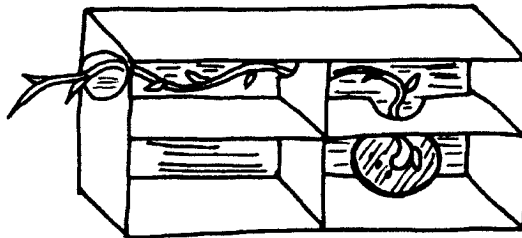
Discuss:

What environmental factors might cause the plants to be unhealthy?

What environmental factors are more likely to result in healthy plants?

EXPLORE

1. Distribute materials to groups.
2. Have students fill the cup with potting soil and plant the bean seeds.
3. Students should moisten the soil and allow the beans to sprout. This will take about 5-7 days.
4. Demonstrate how to cut two cardboard pieces and tape them inside a shoebox to form a maze for the plants.



5. Have students prepare their own maze boxes. Then tell them to cut a hole in one end of the lid. (You may want to demonstrate this. A circle or rectangle a couple of inches wide allows enough light for this activity.)
6. Place the sprouted bean plant inside the shoebox at one end of the maze.
7. Place the lid on the box so that the hole is on the opposite end from the plant.
8. Ask: *What do you think will happen as the bean seeds sprout and begin to grow?*
9. Have students make written or pictorial entries in their science journals to explain what they have done to set up the investigation and to predict what they think will happen to the plants.
10. Have students open the lid daily to observe the plant growth. Observations should be recorded.
11. Have students spray a fine mist of water on the soil as needed.
12. Students will continue to make daily observations until the plants grow out through the holes in the shoebox lids.

EXPLAIN

As this activity progresses, ask:

What do you notice about the bean plant's growth?

What adaptations or changes do you see the plant making to reach the light exposed by the hole in the lid?

What did you notice about the bean plant's growth?

How does this compare to plants growing outdoors?

EXTEND/APPLY

Based on what they have observed in this lesson, ask students to predict what they think will happen if you place a plant next to the window for a short period of growing time and then turn it away from the window for a short period of growing time. (The plant will grow towards the window at first. After you rotate the plant, it will again grow towards the light.)

EXTENSION

Have students choose partners. Tell them they are going to adopt a plant to observe.

- Take the class outside. Have each pair find a plant they want to observe during a given amount of time.
- Have students observe and describe all they can about the habitat of their plants.
- Have them record the height, color, and flowers or fruit of their plant.
- Students should also include the name of the plant (this may require research), the location, and current date. Take students out periodically to record observations.

ASSESSMENT

Have students explain in their science journals how light affects plant growth.