Potato Maze

Activity Summary

Students create a maze in a shoebox through which a potato plant will grow in search of the source of light. The potato plant will find the light hole and the plant will grow through the hole. This experiment takes four to ten weeks to complete, depending on the potato used and the ambient temperature. This can be done as a demonstration if there isn't enough room or time for students to do it themselves.

- Class time: 45 minutes to make the maze and plant potatoes, 15 minutes each time the class checks mazes to observe the growth of the plants
- Grade level: K-5

Learning Objectives

- Plants use *photosynthesis* to turn energy from the Sun into food.
- In *phototropism* plants grow toward a light source in order to reach that energy.

Materials Needed

- Shoeboxes with lids (see notes in the Preparation section)
- Potatoes (see notes in the Preparation section)
- Potting soil
- Cereal boxes, cracker boxes, or something of similar material
- Tape
- Scissors
- Small containers in which to plant the potato pieces
- Pitcher of water
- Large spoon or small garden shovel

Preparation

- Purchase the potatoes several weeks before this activity and leave them in indirect sunlight to sprout. Organic russet potatoes sprout relatively quickly.
- Cut the potatoes into pieces, where each piece has one or more sprouts on it.
- Cut a hole the size of a quarter out of one end of each box.
- For grades K-2, cut the cereal boxes open for them to cut into smaller pieces to fit into their shoeboxes.

Activity

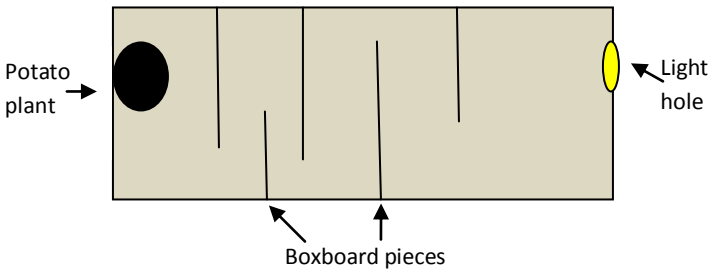
This activity takes up a lot of space: a planting station and a maze building station.

Planting Station: potting soil, small containers, sprouting potato pieces, a pitcher of water, and a large spoon or small shovel.

1. Fill the container 1/3 full of potting soil and add a spoonful of water.
2. Mix the water and soil together.
3. Put the potato on top of the soil with the sprout sticking up.
4. Cover the potato with soil and add a few more spoonfuls of water.

Maze Building Station: shoeboxes, boxboard pieces, tape, and scissors.

1. Cut cereal boxes to create a maze inside of the shoebox. Make the cereal box pieces as tall as the shoebox so that light cannot sneak over the top of the maze.
2. Tape the cereal box pieces to the bottom of the shoebox.
3. At the end without the hole, leave enough room for the potato plant container.



After completing both stations, students place their plants inside the box, at the end opposite of the light hole. Place the lid on top. Examine the box and try to determine whether light is entering the box at any place other than the light hole. Each student should predict what will happen to their plant, perhaps even writing or drawing their predictions on the box or on paper taped to the lid.

Place the completed boxes in an area that receives direct sunlight, with the light holes pointed toward the sunlight. It may help to cover the boxes with a blanket, leaving only the light holes exposed.

Water the plants two to three times per week, and make observations throughout. It should take four to ten weeks for plants to reach the holes. During observations, ask:

- *What do you notice about the path that your plant took?*
- *What color is it?*
- *What do you think will happen next?*