Variables

What are variables?

A **variable** is anything that can change in an experiment. For example, imagine an experiment that tests how much water tomato plants need to grow. The variables would include container size, soil type, water amounts, and hours of sunlight.

In any experiment, you must **control,** or keep the same, all the variables except the one you are testing. This helps you know that your

results are caused by the variable you tested. The variable that is allowed to change in an experiment is the **independent variable.** In the experiment with the tomato plants, the independent variable is the amount of water each plant receives. All other variables are controlled, or kept the same.

Recall the following investigations:

1. Juanita planted seeds with an oblong shape in three containers. She placed ten seeds with the pointed end facing down in one container. In the second container, she placed ten seeds with the pointed end facing up. She put ten seeds pointing sideways in a third container. All the seeds were covered with soil. Each container was given equal amounts of water and light each day. Within three weeks, ten plants were growing in each of the containers.

2. Dylan calculated the density of water and of four solid objects. He then placed the objects in a tub filled with water. Dylan observed that the objects that were more dense than water sank to the bottom of the tub. The object that was less dense than water floated to the water's surface.

3. Shari set up plastic bowling pins 0.5 m from the end of a ramp. She rolled a ball down the ramp and into the pins. She then counted how many of the pins the rolling ball moved. She repeated this three more times using balls of different masses. Shari observed that the ball with the greatest mass moved the most pins.

Show What You Know

Identify the independent variable in each investigation above.

1. Independent variable: _____

2. Independent variable: _____

3. Independent variable: _____