

Topic: Botany



### **A Swell Activity**

**Primary Audience: K – 2nd**

**Description:** Learn what happens to dried beans when soaked in water.

#### **Materials (per team of 4 students):**

- 4 test vials with lids
- 4-6 different types of dried beans and/or peas
- Waterproof marker
- Metric ruler
- Glue

#### **Instructions:**

1. Each student will select one of the types of dried beans or peas to study. Observe! What do your beans look like? How do their size, color and shape compare to the other kinds of dried beans? Glue one sample bean of each variety to a sheet of paper. Label the beans with their appropriate names and jot down some of the key characteristics of each. Have you ever wondered why some beans are named what they are?
2. Each student prepares a test vial containing one type of dried beans for comparison with the rest of the group. Using a metric ruler and a waterproof marker, draw a line on the outside of the plastic vial at a point that is 4 centimeters from the bottom. Count how many beans it takes to fill your test vial up to the 4-centimeter marking. Record the number of beans. Measure and record the size of each bean that will be used to fill your vial to the 4-centimeter mark. What is the mass of your pile of beans? Put the beans back in the plastic vial.
3. What will happen to the beans in the plastic vial if water is added? Share your predictions with the other members of your group. Then, fill the vial to the top with water. Put the vial lid on securely and watch closely!
4. Keep track of the time your beans are soaking in water. What's happening to them? Notice their size, skin, texture, color and other features compared

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to the dry beans. Write a description of how your beans look at 5 minutes, 10 minutes, and 30 minutes after adding the water! Draw a picture of your vial of beans soaking in water.

### **Further Exploration:**

Continue observing the beans for the next couple of days. What's happening to the beans? Are they taking up more or less space in the test vial? What's happening to the water? Are the beans absorbing it? Draw an updated picture of your vial of beans. Measure your beans again. Has their size changed? Has the mass of your beans changed? What do you think would happen if you filled the vial with beans, added water and capped the vial tightly?

### **Teacher Tips:**

This activity can be introduced and set-up in about 45 minutes. Plan to extend this activity over several days. Observations should be made and recorded at 24-hour and 48-hour intervals.

Students work in cooperative groups of 4 students per team.

Concepts include observation, record-keeping and data collecting

Dried beans are very inexpensive (under \$1 per package) and easily obtained in most grocery stores. For a typical class of 30 students, purchase 4-6 small packages of different types of dried beans, peas, etc. Suggestions include kidney beans, baby lima beans, black beans, pinto beans, lentils, green or yellow split peas, black-eyed peas, and great northern beans.

At the conclusion of this investigation, remove bean seeds from vials and put them in moist dishes to sprout. Transplant seeds into potting soil or garden after they begin to sprout leaves and watch them grow!

Vials may be difficult to clean and reuse after this investigation. Soaking in warm, soapy water helps.

### **Relevant Ohio Science Content Standards:**

Physical Sciences K-2 A: Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.

- 1.3.Explore and observe that things can be done to materials to

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change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending and exposing to light).

- 1.4. Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper).