

# What Is a Seed?

## OBJECTIVES

Students closely examine a variety of seeds and other small objects, describing and sorting them according to their properties. They then guess which of the objects are seeds and which are not.

### The students

- ▶ examine and describe a variety of small objects and then decide how to sort them into several groups
- ▶ fill in a chart with descriptions of the objects' characteristics
- ▶ divide the objects into two categories—those they think are seeds and those they think are not

## SCHEDULE

About 40 minutes

## VOCABULARY

seed

## MATERIALS

### For each student

- 1 Activity Sheet 1

### For each team of two

- 1 magnifier

### For the class

- 1 chart, Things We Notice
- 1 bag copper pellets
- 1 btl glue, white

- 1 bag gravel†
- 1 marker, felt-tip\*
- 2 shts paper, construction
- 1 pkg seeds, corn
- 1 pkg seeds, marigold
- 1 pkg seeds, morning glory
- 1 pkg seeds, mung bean
- 1 pkg seeds, nasturtium
- 1 pkg seeds, pea
- 1 pkg seeds, pinto bean
- 1 pkg seeds, radish
- 1 pkg seeds, rye grass
- 1 pkg seeds, sunflower
- 1 roll tape, transparent
- 1 teaspoon, measuring\*
- 16 trays, plastic
- 1 bag vermiculite†

\*provided by the teacher

†in separate box

## PREPARATION

- 1 Several days before beginning this activity, ask students to bring to class objects they think might be seeds. Ask them to bring two of each kind of object.
- 2 Make a copy of Activity Sheet 1 for each student.
- 3 Divide about half the seeds in each packet evenly among sixteen plastic trays. (Each tray should have four or five seeds of each kind.) Also place a half teaspoon each of the gravel, vermiculite, and copper pellets on each tray.
- 4 Hang the Things We Notice chart where all students can see it.

- 5 Cut each sheet of construction paper into eight pieces and place some glue on each piece, one for each team.
- 6 Each team of two will need a magnifier, a tray of seeds and other objects, and some glue.

## BACKGROUND INFORMATION

**Seeds** are plant structures formed in the cones or flowers of plants. Once the female parts of plants are fertilized with the pollen produced by the male parts of plants, they form seeds. Although most seeds are very small, they are capable of growing into new plants.

Seeds may remain inactive for weeks, months, or even years, lying in wait for growing conditions to be just right for sprouting. When the temperature is favorable and the water supply is adequate, they become active and quickly begin to sprout and grow.

Seeds come in a wide variety of shapes, colors, and sizes. Many of them are edible, such as sunflower seeds, pinto beans, corn, and peas. Seeds contain stored food, intended to nourish the new plant as it begins to grow, and these proteins and carbohydrates are a rich source of nutrients for animals, including humans, as well. As a matter of fact, it is seeds that provide most of the people of the world with their staple foods—wheat, corn, and rice.

In this activity, students examine a variety of small items and guess whether or not they are seeds. In the next activity, they will plant the items to discover which ones grow. Many of their assumptions about what is and what is not a seed are challenged as they work through these activities.

### ▼ Activity Sheet 1

#### What Is a Seed?

These are seeds.

Answers will vary.

These are not seeds.

Answers will vary.

## Guiding the Activity

- 1 Write *seed* on the board. Ask, **What is a seed?**

Tell students that a **seed** is a plant structure that contains a plant embryo and a stored food supply that is capable of growing into a plant if conditions are right.

Tell students that they will be doing some looking, wondering, and experimenting to learn more about seeds in the following activities.

- 2 Distribute a magnifier and a tray with the seeds and other objects to each team of two.

If necessary, show students how to use the magnifier.

Tell students that at least some of the objects on their trays are seeds. Ask, **How can you tell whether something is a seed or not?**

Allow students time to look closely at all the objects on their trays. Challenge them to use their magnifiers to discover as much as they can about each object (see Figure 1-1).

## Additional Information

*Some students may know that a seed is something that can grow into a plant.*

*Have students add to their trays the objects they brought in that they think might be seeds.*

*Either hold the magnifier close to your eye and move your head closer and closer to the object to be viewed until the object is in focus; or hold your head 20–25 cm away from the object and move the magnifier back and forth between your eye and the object until the object is in focus.*

*Students' answers will vary and will depend upon their experiences to date. Accept all responses at this point.*

*Students are apt to report their discoveries spontaneously. Circulate among them and listen to their remarks so you can use them in the following discussion.*



▲ Figure 1-1. Examining the small objects on the tray.

## Guiding the Activity

### Additional Information

- 3 Direct students' attention to the Things We Notice chart. Ask each team in turn, **What have you noticed about the objects on your tray?**

As students offer descriptive words, write them in the appropriate columns of the Things We Notice chart.

*Students are likely to mention the colors, textures, and sizes of the various objects, saying, for example, "Some are brown. Some are wrinkled. Some are big."*

*For example, if they volunteer that some of the objects are black and others are brown, write these words under the heading Color. If they say that a seed is wrinkled or smooth, write these words under the heading Texture. Use the last column on the chart to list words that do not fall into any of the categories shown, or have students create a category of their own.*

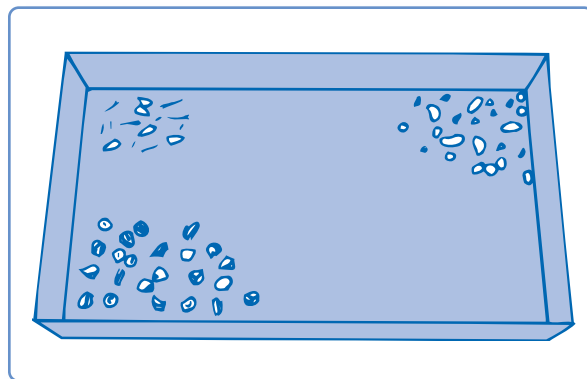
- 4 Tell students to divide the objects into three or more groups, using whatever criteria they choose for sorting them in a particular way (see Figure 1-2).

When all the teams have completed the sorting, ask each team in turn to tell the class which objects they grouped together and why they sorted them as they did. Add any new descriptive words that students use to the chart.

*Being challenged to sort the objects into groups requires students to observe each item closely and think about its characteristics.*

*Students might use quite different criteria for sorting than those an adult would use.*

Ask, **Which of these objects do you think are seeds?**



▲ Figure 1-2. One way to sort the small objects.

*Again, accept all answers, encouraging students to explain their reasoning. Students may say such things as, "This is not a seed; it is a bean," or "This is a seed; it is bumpy." By listening carefully to their remarks, you can discover their preconceptions.*

## Guiding the Activity

Encourage students to share ideas and discuss their reasoning among themselves. Ask each student who offers a suggestion to explain why he or she sorted the objects a certain way; then ask the class, **Did anyone else sort their objects that way? Did anyone sort them differently? Why?**

- 5** Tell students to separate the objects on their trays into two piles: one pile of items they think are seeds and the other pile of items they think are not seeds.

Give a copy of **Activity Sheet 1** to each student. Distribute glue to each team. Tell students to glue two or three objects they think are seeds onto their activity sheets under the heading *These are seeds* and glue two or three objects they think are not seeds under the heading *These are not seeds*.

Tell students that over the next week or two they will find out which of these objects really are seeds.

## Additional Information

*Students may have widely divergent opinions. Allow these to go unchallenged for now.*

*Some students may have already used this as a sorting criterion.*

*If students have difficulty gluing beans or other large objects onto their activity sheets, suggest that they use transparent tape, or draw pictures of the objects instead.*

## REINFORCEMENT

On the Things We Notice chart, have students take turns taping objects from their trays next to words that describe those objects.

## SCIENCE JOURNALS

Have students place their completed activity sheets in their science journals.

## CLEANUP

Collect the trays with seeds and other objects. You may want to have a few students with fine-motor skills help you sort the objects into separate containers and replace the seeds in their original packets. Set aside the objects that students brought to class for use in Activity 2. Return the seed packets, vermiculite, gravel, copper pellets, plastic trays, magnifiers, and bottle of white glue to the kit. Leave the Things We Notice chart posted.

## Connections

### Science Challenge

Bring an avocado to class, and ask students if they know what it is and whether they have ever eaten one. After washing your hands (as a model of healthy behavior for students), peel the avocado, remove the fleshy part, and cut it into small pieces for students to taste if they wish. Show students the avocado pit and ask them if they think it is a seed. Accept both Yes and No responses. When students plant seeds in Activity 2, also start the avocado seed as follows: Hold the seed with its wide end down, and stick three toothpicks into it about halfway up. Place the seed into a wide-mouthed jar and add water until the seed's bottom is submerged. Put the jar in a location with bright light but not long periods of direct sunlight. As needed, add water to the jar to keep the seed from drying out. Let students check the seed regularly to see if it is putting out roots. (Avocado embryos sprout slowly, so it may take as long as a month or two for the seed to grow roots.) A few weeks after roots develop, the stem will emerge. When the sprout has grown a few leaves, plant it in soil. An avocado plant can grow quite large if it is transplanted into a larger pot with fresh soil every other year. Also remember to keep the plant in bright light but not direct sunlight and to keep the soil well watered.

### Science Extension

To give students additional practice in identifying the characteristics (properties) of objects, play a game of “I Spy” in which one student names properties of an object without revealing what it is, and the other students guess the object being described. Start the game yourself to demonstrate the procedure: for example, “I spy something long and thin and yellow and pointed at one end,” for a pencil. Once students have the idea, let them initiate the descriptions. At the easiest level, students can describe objects

that are visible inside the classroom and from a window. Older students could play the more difficult game of “I’m Thinking of . . .,” in which they identify properties of common objects that are not in view, such as a household appliance, a tool, or an elephant.

### Science and Language Arts

Write *seed* on a large sheet of chart paper and pronounce the word. Then ask students to name as many words as they can think of that rhyme with *seed*, and list their suggestions as they offer them. (Students may mention the verbs *read* and *lead*. If they have not yet learned the *ee* and *ea* spellings of the long-*e* sound, do not comment on the *ea* spelling as you add *read* and *lead* to the list. If they are learning these alternate spellings, point them out as you add the words to the list.) Review the completed list with students, then suggest that they use some of the words to create short poems. Write each poem on a separate sheet of chart paper. Display students’ poems in the classroom for a time.

### Science, Technology, and Society

Provide magnifiers of different sizes, shapes, and magnification power, and let students use them to examine pictures and words in books and magazines; fabrics; different kinds of paper; wood; their own skin; plant leaves; and various other objects in the room. Depending on your students’ maturity, you also might want to provide a simple microscope, a pair of binoculars, and a telescope for them to try. Discuss how each device lets us see things that we could not see with our “bare” eyes—either by making small things look bigger than they really are or by making far-away things look closer than they really are.