

00:06 Speaker 1: In this part, students use two kinds of sprouting devices to find out what effect water has on seeds. The focus question is, what effect does water have on seeds? Here's what you'll need from the kit.

00:20 S1: For each group, one quarter liter container with lid. One-round filter paper. Seven bush bean seeds, seven sunflower seeds, seven pea seeds and seven popcorn seeds. For the class, one sprouter, one brush, one-half liter container, three plastic cups, one pitcher, one set of metric spoons, transparent tape and 70 bush beans 35 sunflower seeds, 35 peas and 35 popcorn seeds. You'll need to supply for each group one sprouting seed place mat, which we'll show you how to prepare. For the class one pitcher or bucket, optional, water, white glue and about 50 milliliters of bleach. Make copies of all notebook sheets, teacher masters and assessment master's listed on the materials page for this part.

01:26 S1: Before beginning, familiarize yourself with the class sprouter. It has three groove trays with siphons, which you can see here with red caps, a collecting bowl and a lid. To prevent mold from contaminating the seeds, thoroughly wash the sprouter with a brush, using hot water and soap. For the final rinse, use a weak bleach solution, make sure the red caps are on the water draining tubes, rotate the trays so the drains are not directly above or below one another, stack the trays, pour a half liter of water into the top tray.

02:05 S1: The water flows slowly through the sprouter one tray at a time and collects in the bottom bowl. A small amount of water remains in each tray to moisten the seeds. When all the water has drained, empty the bottom bowl. Do not reuse this water. If the water does not flow through, check for an air lock, tap or twist the Red Caps to eliminate any air. Select a convenient place for the sprouter in the classroom away from direct sunlight, care for the seeds every day. In addition to the large sprouter shared by the class. Each group sets up its own mini-sprouter. See the investigations guide to practice setting a mini-sprouter up before beginning this part.

02:51 S1: All the seeds in both kinds of sprouters should be watered every school day, using a very weak bleach solution. Mix up the solution by adding five milliliters of bleach to about two liters of tap water in the pitcher. It is very important to use the solution to water the seeds every day, as well as checking the seeds every day, and immediately removing any that are starting to mold. Each group will need one sprouting seed place mat, copy Teacher Master two and cut the mats apart. Prepare one mat as an example. Glue four seeds, one each of pea, sunflower, corn and bean in the ovals and write four student names on a copy of the sprouting seed place mat. Have this sample ready to show students when you introduce it later in this part.

03:42 S1: Set aside one seed of each kind for labeling the trays. For the class sprouter, you'll want about 35 Bush bean seeds in the top tray. 35 bush bean seeds in the second tray and about 35 each of the sunflower, pea and popcorn seeds in the third tray. Put the seeds for each tray in a plastic cup. To prepare for the mini-sprouters use the quarter liter containers with lids and place seven of each kind of seed in each container for a total of 28 seeds per container. Each group will need one container of seeds.

04:19 S1: The metric spoons in your kit may be labeled CC rather than ML. One cubic centimeter is equal to one milliliter. For assessment, use the response sheet for this investigation. This video is not intended to replace your FOSS investigations guide. The materials, preparation and procedures may differ slightly from the addition that you are currently using. When in doubt, always follow the

steps as written in your guide.

04:55 S1: To begin, have getters get a quarter liter container of seeds for their groups. Ask students to sort the seeds by kind, discuss the difference in the properties of size, shape, color, and texture among the different kinds of seeds. If necessary, identify the seeds for students. Tell students that seeds are living plants in a resting or dormant stage. Living things are organisms, invite students to suggest what is needed to make seeds grow. Then ask, what do you think would happen if we just watered the seeds instead of planting them in the soil, would they grow? How could we find out? Next, introduce the focus question and have students transcribe it into their notebooks. What effect does water have on seeds?

05:46 S1: Distribute copies of notebook sheet, the sprouting seed, to each student, tell students to record their observations about the dry seeds. Ask students to select one kind of seed, record its name and draw what the dry seed looks like. Each student in a group will be responsible for recording the changes in only one kind of seed over the week. Let them select one of the seeds or randomly assign seeds. Tell students that they can use the plastic containers to grow seeds with just water, show them how to assemble a mini-sprouter using the quarter liter container, filter paper and lid. Place the filter paper in the container, put six bean, pea, corn and sunflower seeds on the filter paper for a total of 24 seeds.

06:37 S1: Show students your example place mat, the remaining seed of each kind will be glued on the sprouting seed place mat, which also identifies the students in the group. As soon as they are ready, visit each group and fill each mini-sprouter about one quarter full of weak bleach water, enough to cover the seeds. Remind students that the water used to irrigate the seeds is not for drinking. They should not place their hands in their mouths or touch their eyes or face when working with the bleach water. Place the mini-sprouter on your example place mat to show how it identifies the groups sprouter and the seeds they used. Allow the groups time to make their place mats, then show students how to completely drain their sprouters by holding the lid loosely on the top and pouring out all the water.

07:29 S1: After draining, students should push the edge of the filter paper down into the container so the lid will fit tightly. Have students go two at a time to the sink to drain their mini-sprouters. If you don't have a sink, you can use another pitcher for the drained water. Tell students, they will rinse the seeds with the weak bleach solution and observe them each day for a week. Remind students that each student will record observations of one kind of seed only. Store the sprouters on the mats in a cool place out of direct sunlight.

08:03 S1: If your room is very humid, you might try tucking the filter paper under the lid and resting the lid on top of the container. This will allow more air to circulate and might cut down on mold growth. Any excess water in the container can be soaked up with a paper towel. If you live in a dry environment, you'll wanna make sure the lids are completely sealed. Bring out the class sprouter and describe its parts, and how it is used. Bring out the three cups of seeds that you prepared and the pitcher of bleach water, explain that the trays hold seeds, when someone pours water into the top tray, it drains down through the trays to the collecting bowl, watering the seeds as it goes. Tell students that they will want to remember what the seeds were like before they were watered. Show them how to stick a seed on transparent tape, fold the tape over the seed and stick this seed label to the outside of the seed tray.

09:01 S1: Use this method to label all three trays of the sprouter. Put the bean seeds in the top two trays of the sprouter. And put the rest of the seeds in the bottom tray. Fill the half liter container with the bleach water from the pitcher. When students are ready to watch, pour the water gently into the top sprouter tray and put the lid on the sprouter. Now, just wait for the water to siphon down to the collecting bowl. Each day, one group will be responsible for watering the seeds in the class sprouter.

09:41 S1: Each day set aside time for students to make and record observations. Each student will record changes on one of the four kinds of seeds on the sprouting seed notebook sheet. Have students answer the focus question before distributing the response sheet to each student. Have students glue the sheet on the left-hand page of their notebooks and write their responses on the right-hand page. Collect the science notebooks after class and review students' responses. See your investigations guide for what to look for.

10:15 S1: Read the article, the most important seed, using the strategy that is most effective for your class. Discuss the reading using the strategies described in the investigations guide for your edition and the questions at the end of the article. To conclude this part or to start the next, ask students to pair up to share their answers to the focus question. See the science-centered language development chapter for more strategies and sentence frames to help guide student discussion. For more information, including discussion questions, teaching notes and English learner notes, plus additional strategies for science notebooks, language development and assessment, please refer to your FOSS teacher toolkit.