Germination Stations

Objective: Students will observe germination of various seed types.

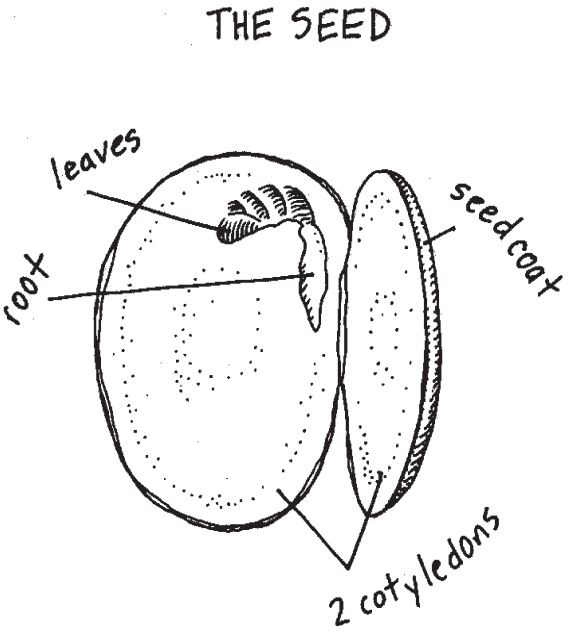
Summary: Students will look at various seeds and see how they swell and sprout.

Time: 20 minutes first day; 30 minutes second day; additional time daily as long as you want to let the seeds grow.

Student Grouping: Three to four students per group

Materials: Packages of seeds, petri dishes or jar lids, spray bottles, paper towels or facial tissues.

Background Information: Seeds are tiny packages that contain all the instructions for an entire new plant. When the right conditions exist, these little packages get to the work of becoming a plant. "Germination" is the term used to describe the initiation of this process. When a seed encounters the right temperature and moisture conditions, it will generally soak up water, splitting open its seed coat. A root will emerge, looking for the food and water it will need to grow into a healthy plant. The seed has germinated.



Marin Ag. Facts: Many, if not most, of the crops grown in this county are started from seed. The alternative to growing from seed is to purchase small plants, called "starts," from a nursery and plant them. It is easier to control pests, keep plants warm, and maintain soil moisture in a greenhouse while the plants are small and tender. Farmers do this themselves. They purchase seed, germinate it in containers, then transplant the resulting seedlings. Often the initial transplanting is into larger containers, and the tiny plants are grown further before being planted in the open fields of the farm. In this way the plants can be started before all danger of frost has passed. The containers of tiny plants are kept protected in greenhouses, and the plants get a head start and are partially grown when the weather settles in the late spring.

It would be too labor intensive to grow a huge field of hay or corn from starts. This large field crop is sown, planted, from seed. The soil is turned to disrupt weeds, the seed is spread at the appropriate depth, then the farmer moistens the soil for germination. Once the seeds have germinated and sent roots down into the soil, watering can be slowed to intermittent irrigation for most crops. Because keeping the soil moist is vital for good germination, many farmers will plant during the wetter times of year so the rains can do the irrigation for them. Warm weather and long days make most plants grow quickly. The spring is often the optimum time to plant, allowing spring showers to provide the moisture for germination. Later summer heat supports growth.

Preparation:

1. Acquire your seeds, one package of each: corn, lima bean, radish, green bean and wheat will give good variety and be more than enough in quantity. Wheat seeds can be purchased as wheat berries at a health food store if you are having a hard time buying in small quantities at nurseries. You can use just a few of these if availability or budget is limited. Be careful of corn seeds. Some are treated with a bright- colored fungicide that is not good to have children handle. Collect sprouting containers. Ones that hold the moisture in and allow easy observation are ideal.
2. Decide how you will group the students. Each group will have a specific seed type, and students will look at other groups' seeds to observe variety. You can give each group several types of seed, but logistics are more difficult and you will need more containers if they are to be kept separate.

Procedure:

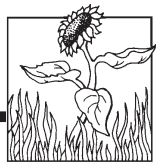
1. Distribute a different type of seed to each group. Ten seeds per group is plenty, more is fine if containers are large.
2. Have students make observations about their seeds: color, size, texture, smell.
3. Place seeds in a container and cover with water. Ask students to write down predictions, changes they expect from soaking. Leave seeds overnight, allowing them to soak.
4. Drain off the water and have students make observations. They can dissect a few seeds to see the insides, but be sure several are left intact for further growth.
5. Instruct the students that they must keep the seeds moist. This is easily done by keeping them on a damp paper towel or tissue in a covered container.
6. Have them return and make notes on changes every day for as long as you desire the project to continue. Some seeds need just overnight to germinate, others take days. Radishes and green beans give especially clear and relatively quick results.

Questions for Discussion:

- How did your seed look when you first got it?
- Did it change when it was soaked? How? Is that the change you expected?
- Does any one know the word "germination"?
- Did all the seeds germinate?
- What might prevent germination?

Extensions:

- Hand out seeds to student pairs. Blindfold one student and then have them feel the seed. Then take the seed away and have that seed drawn without the blindfold. Repeat with various seed types. Once they are drawn, have the student try to identify which seed is which from their drawings.
- Have the students plant some of their germinated seeds and continue to grow the plants. These little starts can be planted outdoors, depending on weather, and/or given as Mother's Day gifts or planted on the school grounds as part of a garden project.
- A fun way to collect seeds and learn about seed dispersal methods is to have students put an old sock on the outside of their shoes and go for a walk in a weedy area. The sock is then germinated by adding water and keeping it damp. This lets students become aware that annoying stickers are not just stickers, they're hitchhiking seeds! This is a technique that allows a plant species to spread its offspring around.
- Use a picture of a dissected seed and talk about the different seed parts, germ, root, cotyledons, etc.



Germination Stations ID

Draw dry seed.

Predict what will happen when seeds are soaked overnight.

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Draw soaked seed.

Split open a seed and draw it here.

Note here the changes observed:_____

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Each day draw the seed and write down the changes you observe:

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Estación de Germinación

Dibuja la semilla seca.

Predice lo que va a pasar al remojar las semillas durante la noche:

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Dibuja la semilla remojada.

Abre la semilla y dibuja aquí lo que ves.

Nota los cambios que ves y escribe acerca de tus observaciones de los cambios: _____

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Cada día dibuja la semilla y escribe acerca de tus observaciones:

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