



The germination process can be somewhat mysterious because it typically occurs underground where it can not be observed. The clear plastic glove and cotton balls used in this activity provide an opportunity to view the germination process and the plant's beginning growth and root system. In order for a seed to **germinate**, or sprout, it needs warmth, moisture, and air. Seeds remain **dormant** and will not germinate until the proper conditions are present. Moisture softens the seed's outer protective covering, called the **seed coat**. The **embryo** pushes through the softened seed coat and the new plant begins to grow. The roots push further down and a shoot, which contains the plant's new stems and leaves, pushes up towards the surface.

Materials:

- Food handler's glove (if not available, use plastic sandwich bags or plastic wrap)
- Permanent marker
- 5 cotton balls
- Bowl of water
- Soybean, corn, oat, wheat, or alfalfa seeds (or any seeds that are available to you)
- Tape

Instructions:

1. Use a marker to write the name of the seeds on each of the glove's fingers. Write one seed type per finger.
2. Dip the cotton balls in water and wring them out. The cotton balls should be slightly damp. Moistened water beads or small amounts of moistened soil also works in place of cotton balls.
3. Put two or three seeds of the same type into each cotton ball.
4. Place a cotton ball inside each finger of the glove. You may need to use a pencil to push the cotton ball all the way to the tip of the glove's finger. Make sure the type of seed matches the label written on the finger.
5. Blow a small amount of air into the plastic glove and close it with tape.
6. Tape or hang the glove in a warm place, like a sunny window. Keep an eye on the seeds over the next few days - you should start to notice something interesting!

Interest Approach:

A seed needs water, air, and warmth to germinate. What do you think might happen if one of these needs were missing? Conduct an investigation to discover what happens when you try to germinate a seed without either water, air, or warmth being present.

- No Air - Remove as much air as possible from the finger (or bag) and tightly wrap a rubber band just above the cotton ball.
- No Warmth - Place the finger (or bag) into the bowl of ice or remove the finger (or bag), secure the opening with tape, and place in the refrigerator.
- No Water - Place a dry cotton ball and seeds into the finger (or bag)

Record daily observations of the seeds for two weeks. What can you conclude?