

Sprout your own sprouts!

Name: _____ Date: _____

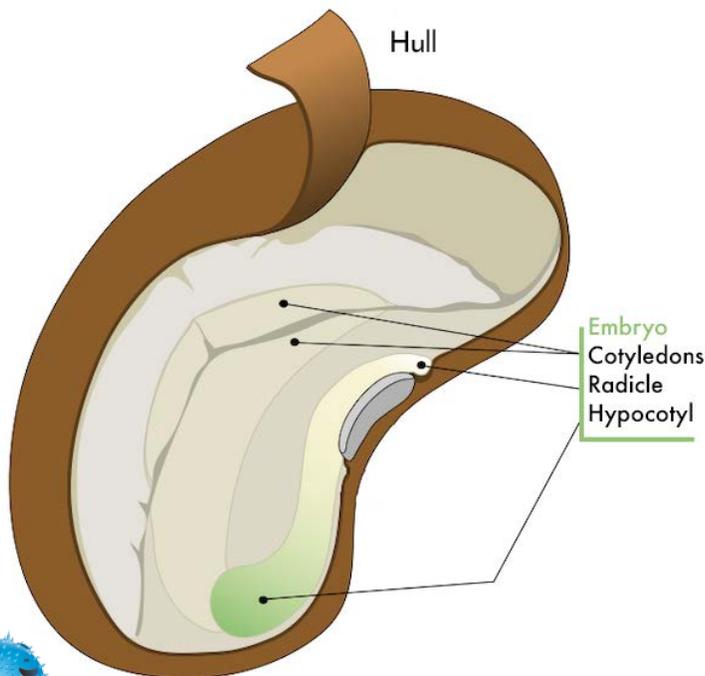
Instructions:

1. Gather your materials to build your experiment:
 - a. Glass Jar (or clear plastic), mesh or sprouting screen (e.g. reusable produce bags, cheese cloth), rubber band, water, drying rack or container to catch water (so you can place your jar with the cloth upside down to drain), sprout Seeds (e.g. lentils or alfalfa seeds)
2. Read the background information to learn about seeds:

Background on Seeds

A seed is a ready-packed suitcase of nutrition (Fig. 5). Inside is a dormant **embryo** that can eventually grow into a plant. The **hull** is a protective coating to keep the embryo safe. In order to start **germination**, we add water to activate the seed. The water opens up the hull and allows the embryo to use the nutrients inside the seed to fuel the plant's growth. In addition to water, the seed needs oxygen to start growing.

As the seed sprouts and starts to grow into a plant, roots will develop to collect nutrients and water. Eventually, leaves will grow to absorb sunlight and carbon dioxide (CO₂) from the air, which the plant will use to **photosynthesize**. (Note: plants also absorb oxygen from the air for **respiration**. This is especially evident at night when there is no sunlight for photosynthesis.)



- **Embryo:** the part of a seed which develops into a plant. It consists of a plumule and hypocotyl (primary stem), a radicle (primary root), and one or two cotyledons (primary leaves).
- **Germination:** the process by which an organism grows from a seed or similar structure.
- **Hull:** the outer covering of a fruit or seed, especially the pod of peas and beans, or the husk of grain.
- **Photosynthesis:** the process by which plants use energy from sunlight to grow. Photosynthesis uses carbon dioxide and water and releases oxygen.
- **Respiration:** the process of breaking down food to usable energy inside a cell. Aerobic respiration uses oxygen and releases carbon dioxide and water.

Activate your seeds:

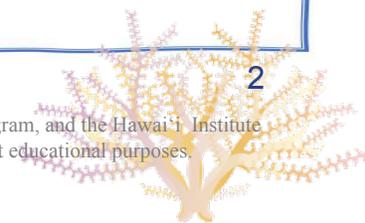
3. Measure out the desired amount of seeds into the jar. If you are using more than one type of seed, label your jars. *Note: 1/4 cup of alfalfa seeds create over 2 cups of sprouts - a little bit goes a long way!*
4. Add enough water so all seeds are covered.
5. Cover the jar with the mesh, securing with a rubber band.
6. Soak your seeds overnight.
7. After soaking, rinse and drain your seeds **thoroughly**.
8. Secure the mesh in place, and leave the jar tilted upside down so water can continue to drain freely. *Note: sprouts need oxygen, so be sure to find a place (such as a drying rack) that can allow air flow while seeds are growing.*

Daily care of your seeds:

9. Your seeds need to be rinsed and drained at least once per day (more if you can!).
 - a. Turn the jar upright, and fill with enough water to cover the seeds. Gently shake the seeds in the jar.
 - b. Drain again **thoroughly**. Repeat one more time.
10. Draw a picture of one of your sprouts (choose one that represents average growth).
11. Resecure the mesh, and leave the jar tilted upside down so water can continue to drain freely.
12. Repeat steps 9-11 once or twice daily for the next few days.
13. Sprouts are packed with nutrition and can be eaten as they grow! Try eating a sprout each day to see how the flavor changes!



Draw your sprouts as they grow:



Activity Questions

1. Describe what your seeds looked like as they began to sprout.
2. What did you do each day to help your seeds sprout and grow?
3. What happened to your sprouts as time went on?
4. Did you notice your sprouts growing in a particular direction? Describe.
5. Draw a picture of one of your finished sprouts. Label the leaves, stem, and roots. If your sprout still has some of the seed, label that also.
6. Why do you think your sprouts were able to grow without dirt?
7. Based on your investigation of sprouts, what are the key ingredients that a seed needs to grow?

