



Seeds





Our Blue Marble: Seeds

Activity 1: Seed Dissection

Objectives: Students will learn about seeds by dissecting a lima bean seed.

Materials Needed:

- ✓ Lima beans – 1 one-pound bag
- ✓ Paper trays – 1 set of 100
- ✓ Plastic tray – Can be shared with *Paper Mountains Activity*
- ✓ Tweezers – 1 pack of 12

Summary of Student Action:

Students will take apart a seed – a lima bean – to learn more about seeds and their structures.

Setup Instructions:

Soak the whole bag of lima beans for 12-24 hours before the dissection.

Additional Notes:

You can create an example by pre-dissecting one of the seeds. You can use this if components cannot be seen on the participants' specimen.



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Activity 1: Seed Dissection

Activate Your Knowledge:

We know that seeds can grow into plants, but do you know how? Try dissecting a seed to see what is inside and to gain a better understand how something so small can grow to be so large.

Materials You Will Need:

- ✓ 1 lima bean
- ✓ 1 paper or plastic tray
- ✓ 1 pair of tweezers

Procedures:

1. Select a large white seed to dissect. Do you recognize the seed? What kind of observations can you make about the way the seed looks?
2. Roll the seed between your fingers. See if you can peel off the outer coat of the seed. This is called the seed coat. It protects the seed from organisms that may try to eat it.
3. Once you have removed the seed coat, gently pinch the sides of the seed. The seed should split in half. Carefully take the halves apart. What can you observe about the halves? Each half is called a cotyledon. The cotyledons provide nutrients for the seed when it starts to grow. What do nutrients do for the seed?
4. One cotyledon will have the embryo attached to the inside of it. Locate the embryo. The end of the embryo is called the radical. he radical is what will grow into the root of the plant.





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Activity 2: Seed Planting in Soil

Objective: Students will plant a seed in two different ways to see how the seed grows.

Materials Needed:

- ✓ Lima beans – 1 one-pound bag
- ✓ Seed cups – 2 packs of 100
- ✓ Potting soil – 1 bag of 16 quarts
- ✓ Squeeze bottle – Take 2 from Station 2
- ✓ Paper towels – 6 rolls split between Activity 1 and Activity 2
- ✓ Plastic bag – 1 container of 300

Summary of Student Action:

Students will plant seeds two ways and continue the experiment at home to see if the seeds grow differently.

Setup Instructions:

- Set out the seed cups, the soil, and one bag of seeds on one half of the table.
- Prefill 10-20 of the seed cups with potting soil.
- On the other half of the table set out the paper towels, plastic bags, and other bag of seeds.
- You can pre-tear some paper towel sheets in advance of the activity.
- Fill the squirt bottles with water.

Additional Notes:

- If participants prefer to only plant a seed one way, they can do so.
- You can give participants a sharpie to write their name on their seed container(s).
- Use one of the seed cups to scoop the potting soil out of the bag.



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Activity 2, Part 1: Seed Planting in Soil

Activate Your Knowledge:

What happens when you plant a seed? What do seeds need to survive? We will plant a seed to allow the embryo to grow. We will plant a seed two ways: 1. using soil and 2. using a plastic bag. After you plant your seeds, watch them at home to see how they grow!

Materials You Will Need:

- ✓ 1 seed cup
- ✓ $\frac{1}{4}$ cup of soil
- ✓ 1 lima bean
- ✓ 1 squeeze bottle filled with water

Procedures:

1. To plant the seed in soil, grab one of the seed cups and fill it with soil. Do not pack in the soil and fill it just below the edge of the cup.
2. Take your pointer finger and push into the top of the soil about an inch to create a small hole. Drop the seed in the hole and fill the hole with soil.
3. Use the squirt bottle to moisten the soil so that it is damp. You do not want puddles of water in the top of the cup.
4. When you get home, place the cup in a sunny, warm spot. Water your seed when the soil is dry to the touch and does not stick to your finger. Check on your seed and keep track of how it grows.



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Activity 2, Part 2: Seed Planting in Plastic

Activate Your Knowledge:

What happens when you plant a seed? What do seeds need to survive? We will plant a seed to allow the embryo to grow. We will plant a seed two ways: 1. using soil and 2. using a plastic bag. After you plant your seeds, watch them at home to see how they grow!

Materials You Will Need:

- ✓ 1 Plastic Bag
- ✓ 1 Paper Towel
- ✓ 1 Lima Bean
- ✓ 1 Squeeze Bottle filled with water

Procedures:

1. Take a single paper towel and lay it on the table. If it is a full-size paper towel, fold the paper towel in half and then in half again. If it is a half-sheet paper towel, fold the paper towel in half only once. Just make sure it needs to be small enough to fit inside the bag.
2. Take a seed and place it inside the paper towel between the folds.
3. Using a squirt bottle, moisten the paper towel.
4. Place the damp paper towel and a lima bean inside the plastic bag and close the bag.
5. Once home, the bag should be taped or hung inside a window or pinned to a cork board in a sunny spot. Check on your seed and keep track of how it grows.

embryo

Parts of a Bean Seed

seed coat

cotyledon (stores food)

