FRESH ROOTS

Activity Guide

Super Seeds!

Learn how special a seed is! Discover some of the cool things seeds can do, what hides inside the seeds we eat, and how they help plants grow.

What's Inside

Suggested Grades

K-3, though it's fun for older kids, too!

Time

30-45 minutes

Subjects

- Science
  - Plant Biology
  - Science Practices
- English Language Arts
  - Reading/Listening
  - Writing/Speaking

Things You'll Want

- Dry Lima bean seeds or other large bean seed
- Magnifying Glass or camera with a zoom function
- Pencils, crayons, markers, or other drawing tools
- Bean outlines and diagram from this packet
- (optional) A Seed is Sleepy by Dianna Hutts Aston and Sylvia Long
  - Or see the book read at https://www.youtube.com/watch?v=9_vElnekJzI

Do Ahead of Time

The night before, place the seeds you are planning to dissect into a cup or bowl of water. They should soak about 8-12 hours.

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A Seed is Sleepy, Part 1

Share the book *A Seed is Sleepy*. You can read to them, they can read to you, our you can watch the video linked above. Stop when you finish the page "A seed is inventive." Don't turn the page! (It'll ruin the surprise!)

Seed Dissection

Observe Dry Beans

You are going to be *dissecting*, or scientifically taking apart, a bean seed. But first, let's take a look at a seed from the outside. Dried beans, like the ones we can cook with, come off the plant just like that! They are the seed of the bean plant, and have everything a bean plant needs to grow.

Use your senses (likely mostly touch and sight) to make some observations about your bean seed. Write down a few words or sentences to describe the dried bean seed you have.

Make a Visual Hypothesis

A *hypothesis* is a scientific guess based on what you already know. Think about what you know from observing the dry bean seed, what you know about seeds from the book (if you're reading it), and what you know from eating or even growing beans before.

Use one of the bean outlines to draw what you think the inside of the bean will look like. You can write a description of what you think you'll find as well!

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Seed Dissection, continued

Observe the Soaked Beans

The soaked bean is much more delicate, and needs to be handled carefully. Start by observing it like you did the dry bean.

Dissect the Soaked Beans

1. To dissect the bean, peel off the seed coat (that's the "skin" on the outside). What do you observe about it? Why would a seed need something like this?

2. Carefully split the bean in half. Try not to touch it once you split it in half!

3. Use a magnifying glass or the zoom on your camera to look at the bean. What do you see? (Hint: There will be one little bit that looks different on the two halves. That's the plant embryo!)

4. Draw what you see in the other bean outline. Take care to draw what you actually see, and not what you think you're supposed to see. Make your drawing bigger than life!

5. Look at the Seed Diagram and compare it to your bean. Can you find the Root and Shoot on your bean? Label them on your drawing.

A Seed is Sleepy, Part 2

Read or watch the rest of *A Seed is Sleepy*. Do you recognize any of the parts of your bean seed in the book?

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Bean Fun Facts!

1. **Beans are nutritious!**
   Beans are full of protein, complex carbohydrates, fiber, and nutrients that our bodies need to play, learn, and grow. Why? Because those are things the plant embyro needs, too!

2. **Beans are prolific!**
   That means they make a lot of beans. One bean seed can grow into a plant that can make 120 new bean seeds, or more! So there's plenty for us to eat and still have plenty of seed to grow new bean plants.

3. **Beans can grow really tall, really!**
   Pole beans, like Scarlet Runners, can grow up to 3 meters in just a couple of months. If you plant pole beans, measuring and graphing their growth is a great math activity!

4. **Beans are helpers!**
   Beans help other plants in the garden to grow by being *nitrogen fixers*. All plants need nitrogen, a chemical element (like oxygen or iron) to grow, and our air is full of it! But plants can't use that nitrogen. Thankfully, special plants like beans, peas, and alder trees have teamed up with bacteria in the soil to solve the problem.

   Nitrogen fixing plants absorb nitrogen in the air and send it to the bacteria, who turn it into a form the plant can use. The bacteria get a safe place to live in the plants' roots, and the plants get so much nitrogen from the bacteria, they can leave it in the soil of other plants to use, too!

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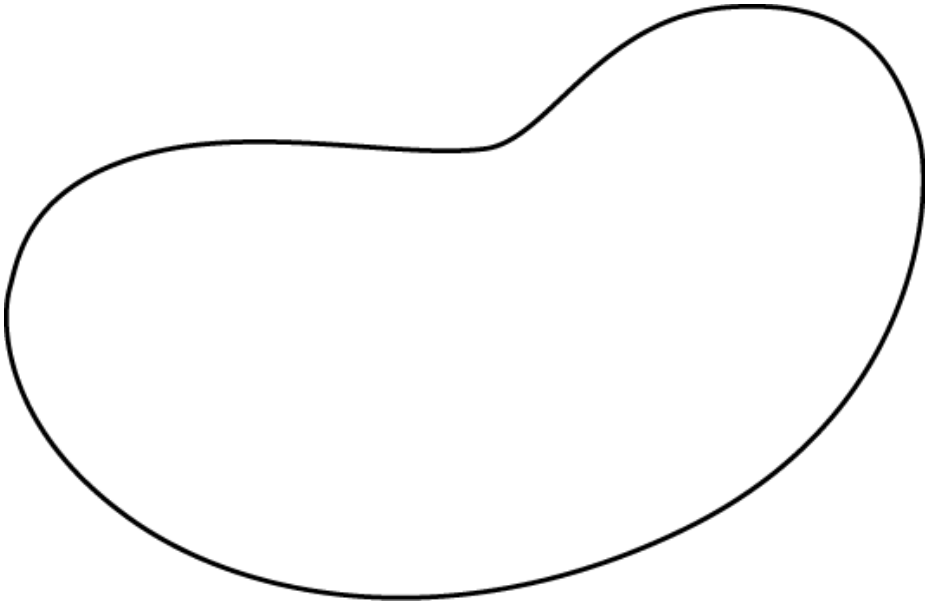
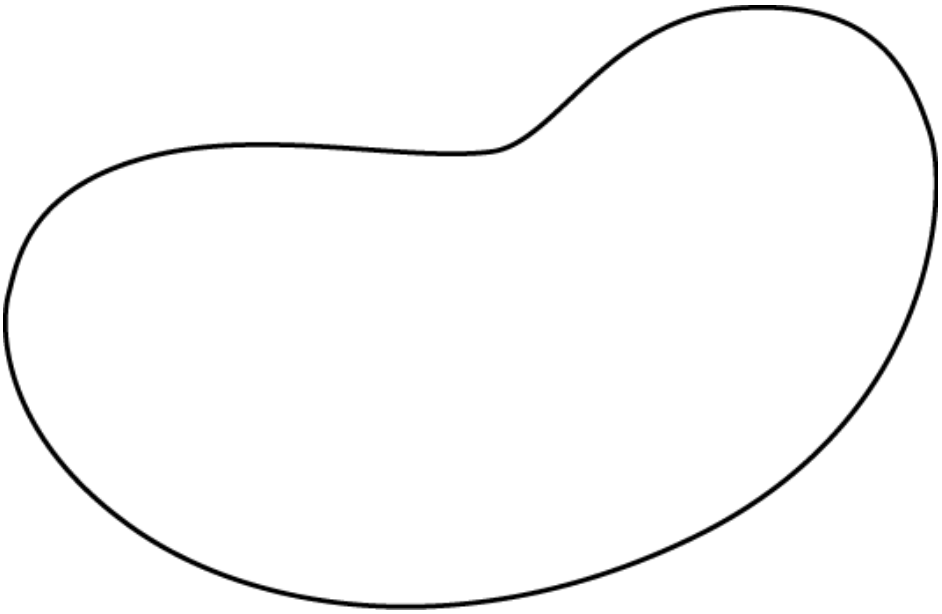
Bean Outlines





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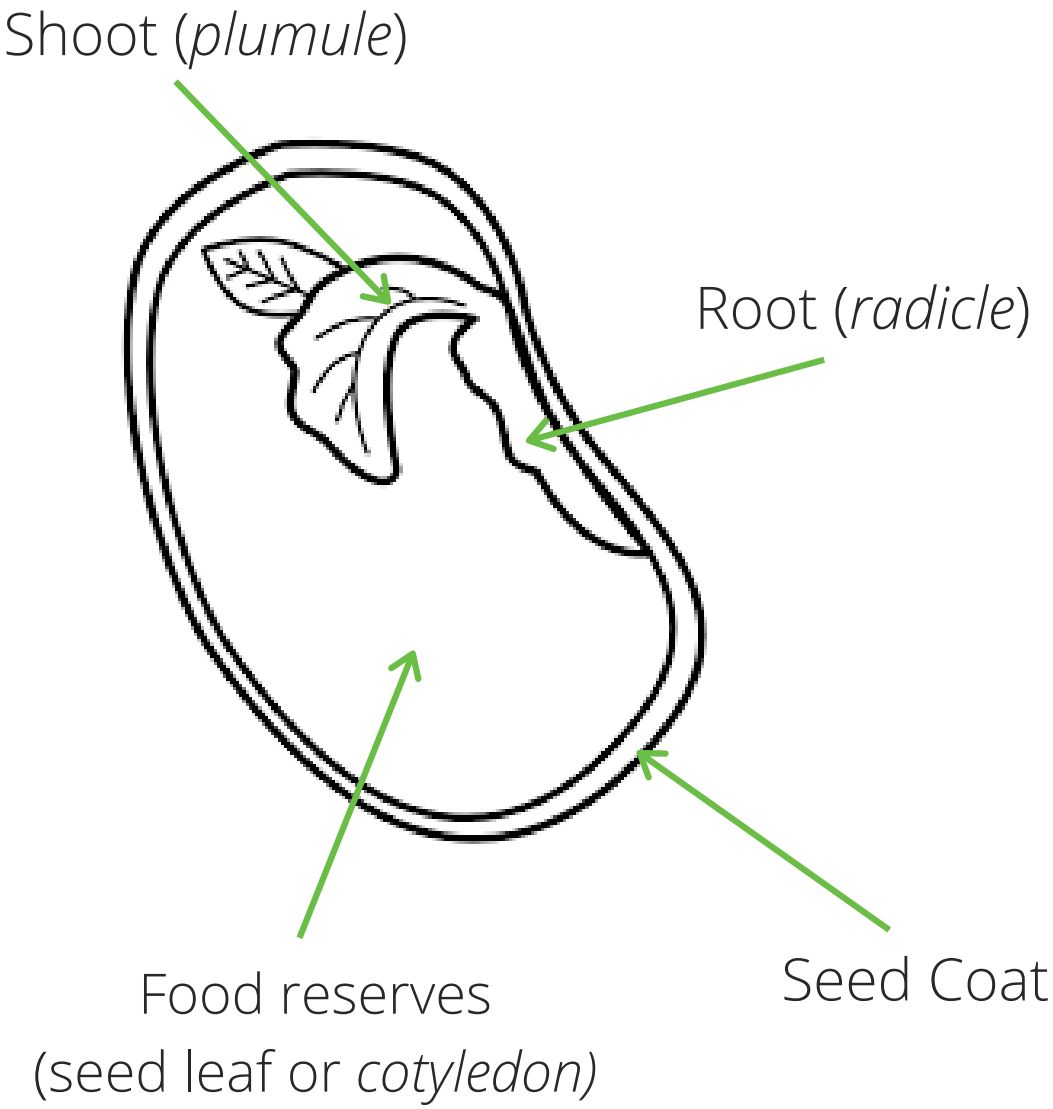
Bean Diagram



Thanks

The seed dissection activity was adapted from one developed by Science World. The bean diagram was created by the Edible Garden Project.