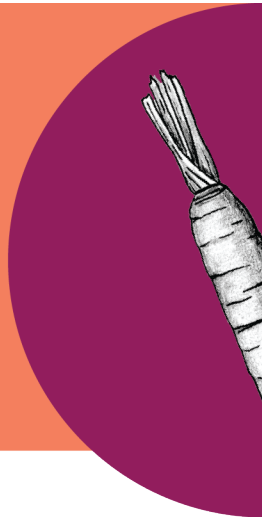


THE EDIBLE SCHOOLYARD PROJECT



ROOT INVESTIGATIONS

Summary: Have you ever wondered what happens below ground when a plant grows? Today, you are going to watch a time-lapse video of a bean seed growing. Next, you will examine the root systems of different plants and make observations. Lastly, you will grow plants whose root systems are easily observable in water.

Before you get started:

- Collect all materials listed below.
- Find a quiet place to sit

Materials:

- A computer, tablet, or phone to watch the video
- A piece of paper or a notebook
- A pen or pencil
- Some colored pencils or markers

Teacher Notes:

- This lesson includes an optional [Building Your Garden Vocabulary](#) worksheet that supports students to learn key vocabulary words and their related terms. We recommend utilizing this resource and making it a central part of the lesson.
- For sections that instruct students to READ, you can record yourself reading aloud and send it to students. Direct them to read along with the recording. This is a helpful strategy for differentiating learning that supports all students, especially English Language Learners.
- The READ sections can also serve as talking points for teachers if the lesson is being taught in person or synchronously.
- If students are completing this lesson as part of [Know, Sow, Grow](#) this is lesson two.



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Name _____

Vocabulary:

- **Germinate:** to begin to grow or develop
- **Leaf:** a flattened structure of a higher plant, typically green and blade-like, that is attached to a stem directly or via a stalk/stem.

Key vocabulary:

- **Root:** the part of the plant that is usually below ground, affixes the plant to the soil and absorbs water and nutrients

Related Words:

- **Taproot:** a primary root growing downward from which secondary roots grow
- **Root Hair:** a hairlike outgrowth of a plant root

Key vocabulary:

- **Branch:** a part of a tree that grows out from the trunk

Related Words:

- **Trunk:** the thick main stem of a tree, from which its branches grow
- **Stem:** the main body of a stalk of a plant that gives rise to leaves and flowers

DO: Use the [Building Your Garden Vocabulary](#) worksheet to help you learn the vocabulary in this lesson. The worksheet is optional unless your teacher has assigned it.

WATCH: Click the following link or type in the URL to watch the video:

<https://tinyurl.com/ESYbean>.

ANSWER: What did you notice about the root systems in the video? What did they look like?

Describe the roots:



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ANSWER: Why do you think plants have roots? How do you think roots support plants? Brainstorm some possible answers:

READ: Roots serve many important functions to plants. Roots help plants to...

- Access water and minerals
- Anchor plants to the ground
- Store food for the plant
- Interact with other organisms in the soil to provide food for the plant

READ: There are different types of roots. Some plants have a main root that can also be called a **primary root** or **taproot**. Smaller roots that branch off the main root are called **secondary roots**. Some plants don't have a main root and instead have a network of small roots called **fibrous roots**. All types of roots have very small growths called **root hairs** that help the plant absorb water and nutrients.

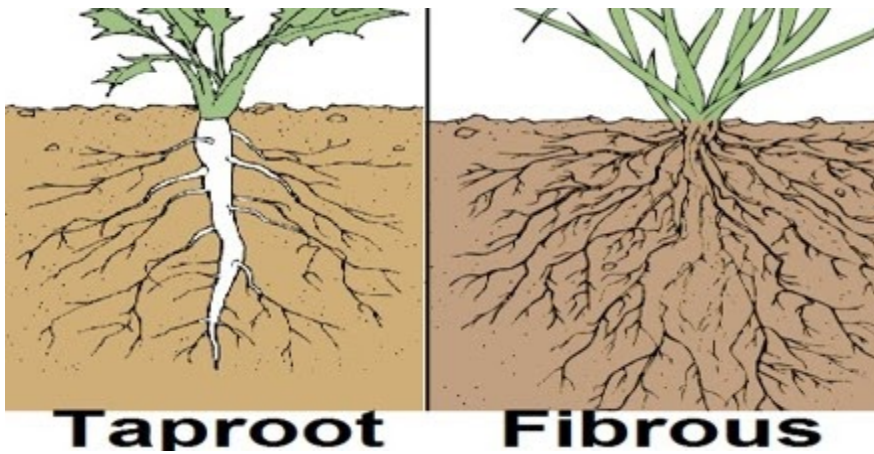


Image one: taproot and fibrous roots

EXPLORE/DRAW: Pull out an unneeded plant or weed (such as dandelion) growing around your home. Make sure you check in with a teacher, parent, or trusted adult before removing that plant. You can also find a picture of a plant on the internet, just make sure the image features the roots of the plant. Now you are going to draw your plant using the following steps:

1. Take a single sheet of paper, fold it in half and then unfold it. When you unfold it, you will see a crease separating the top half from the bottom half of the page.
2. Draw the above-ground part of the plant above the crease
3. Draw the below-ground part of the plant below the crease.

LABEL: Please label your drawing using as many of the vocabulary words as you can.

- **Root:** the part of the plant that is usually below ground, affixes the plant to the soil and absorbs water and nutrients
- **Taproot:** a primary root growing downward from which secondary roots grow
- **Root Hair:** a hair like outgrowth of a plant root
- **Leaf:** a flattened structure of a higher plant, typically green and blade-like, that is attached to a stem directly or via a stalk/stem.
- **Branch:** a part of a tree that grows out from the trunk
- **Trunk:** the thick main stem of a tree, from which its branches grow
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READ: Keeping roots healthy is an important part of plant care. Different plants have different water needs. Some need to grow in standing water while others prefer very dry soil with occasional watering. Research how much water your plants like before watering them.

When you water, notice how your plant responds the day you water and the following day. Generally, the soil should be damp but not soaking wet. Yellow or brown leaves, droopy leaves, or losing leaves are all signs that your plant roots are stressed. Try changing your watering habits and make observations to help you find a better-suited watering schedule.

References

Bean Time-Lapse - 25 Days. *GPhase*. Youtube. Retrieved from

<https://www.youtube.com/watch?v=w77zPAAtVTuI>.

Image One: Describe Types of Roots. (n.d.). Retrieved from <https://qsstudy.com/biology/describe-types-roots>

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