



Investigating Roots

1st & 2nd grade

Students will differentiate between two different types of roots. Students will describe the importance and function of roots for a plant's survival.

20-30 min.

Lesson Objectives:

- **Students describe the structure and function of roots**
- **Students identify the two different types of roots**
- **Students can name at least 3 roots that we eat**

What You Need

Vegetables with roots attached (lettuce, carrot, radish)

Paper and art supplies

Knives

Cutting boards

Trowels

Magnifying glasses

What To Do

Gather students and have them help you name the 6 plant parts (seed, root, stem, leaf, flower, fruit). Explain that each of these parts are edible on different plants. Have them think of examples of plant parts they eat. Explain that each plant part has special jobs it does for the plant. Show the students an example of a vegetable with the root still attached. Ask students what job the root might do for the plant (absorb water & nutrients, store food, stabilize the plant). The root also helps the environment and the farmer by holding the soil in place so it doesn't wash away!

Have the students get into pairs and have each pair harvest 2 or 3 different roots (these should be lettuce or something with fibrous roots—even a weed, and carrots or radishes --something with a taproot). Give clear instructions about how to harvest each plant and perform an example so they learn how to dig up roots properly. Make sure to have them

shake off as much of the soil as possible in the field before returning to the table. If there are not many lettuce plants or plants with fibrous roots, just harvest one for the group and let the pairs harvest taproots.

Have students examine the roots carefully with magnifying glasses or hand lenses.

Ask some guiding questions:

- How are the two roots similar and different?
- Can they find root hairs on each of the plants? What do they think these hairs do? (Absorb nutrients and water). *There are actually microscopic root hairs around the visible ones that help to do the job as well.*
- Which type of root might be better suited for tall plants?

- Which type of root might be especially adapted to store food?

Explain that there are two main types of roots, "Fibrous roots" and "Taproots". Have students decide which type of root the harvested vegetables represent.

- **tap root**- forms when the primary or original roots grows down and enlarges as it stores food (radishes, carrots), allows other roots to grow from it to reach nutrients
- **fibrous root**- forms when the primary or original root stops growing and tinier branch like roots spread out and grow in many directions (lettuce)

Help students wash the tap roots and cut open (dissect) the vegetables and see what is inside. Have them make vertical and horizontal cuts to look at the inside from different perspectives.

Encourage them to describe and draw what they see.

Ask some guiding questions:

- Why do you think the taproot is moist inside?
- Do you see any way that water can get from the roots to the rest of the plant (have them look for a dotted pattern on the horizontal cut, and tube-like structures from the vertical cut)
- Can they see the root connecting to the inside of the vegetable?

Have the students wash their hands and the vegetables, then they can snack on the edible roots at the end!

Extra Information:

There is another type of root that is more complicated to explain:

- **tuberous root**- happens when the primary root enlarges and is used for storing food and water (sweet potatoes)

Plants can also have "tuberous stems" which is when the stem enlarges and is used for storing food and water. Potatoes are actually underground tuberous stems. Sweet potatoes, however are tuberous roots. This may come up as part of the conversation with students, don't feel like you have to explain it if it doesn't come up naturally.