Roots, they keep us stable!

Total time ~45 minutes

Materials:

- Roots: carrots, beets, radishes, potatoes, kohlrabi

On The Board:

Vocabulary

Student Reflection Questions

Suggested Snack:

Have various edible roots in the garden for snack!

Other Resources:

https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=320

Overview:

Students will learn the functions of roots, the difference between fibrous and tap root systems, and identify roots that are edible.

At the end of the lesson students will be able to:

- Explain the functions of roots
- Recognize the difference between fibrous and tap root system
- Identify roots that are edible

Vocabulary:

- **Roots**: the portion of a plant that anchors it in the soil and takes up water, air, and nutrients for feeding the remaining parts above ground
- **Root hairs**: tiny, microscopic outgrowths attached to the outer layer of the main roots that help absorb water and nutrients from the soil
- **Fibrous root system**: formed by thin, moderately branching roots that grow from the stem found in grasses, ferns, and most flowering plants
- **Taproot system**: a straight tapering root growing vertically downward, usually edible and found in carrots, radishes, turnips, and beets
- **Tuber**: the short, thickened, fleshy part of an underground stem, which can grow new shoots – potatoes
- **Harvest**: process or period of time a farmer gathers crops such as corn, potatoes, rice, or any agriculture commodity

Introduction

1. Presentation: Fibrous root system versus Taproot system (5 minutes)
    a. Place various vegetables including some that are edible roots and grow below ground (carrots, beets, radishes, potatoes, etc.) and regular vegetables that grow above ground (tomatoes, cucumbers, mushrooms, broccoli, etc.) on each of the tables and then ask the students:

i. Where do you think these vegetables grow on the plant? (examples – below the ground, up out of the ground, on the stems)

ii. Go around and have each of the groups share their ideas and correct as needed. Then state how some of these vegetables grow underground which makes them a root! Ask them:

1. Have you ever eaten a root before? (You have, some of these vegetables are roots including potatoes!)
2. Potatoes are made into french fries and chips!

b. PowerPoint Presentation

i. Discuss the function of roots and explain that all roots provide an anchor for the plant in the soil and take up nutrients for the plant; however, some roots are edible and some are not. Explain that there are two types of root systems: fibrous and taproot systems and we are going to go to the garden to find the differences.

2. Garden: Group the students in groups of 6-8 with a teacher/volunteer per group and head to the garden. Demonstrate how to pull a weed or any type of fibrous root and how to transplant a fibrous root. Have each group of students pull out one fibrous root and one taproot. Ask the questions: (25 minutes)

a. These questions can be integrated into B, C, D as they learn about roots and the different root systems

i. Can you tell by looking at a plant whether it is a fibrous root or a taproot?
ii. What differences do they see in these roots?
iii. Which root system would give a plant the best anchoring or hold in the soil? (Taproots)
iv. Which root system absorbs water and nutrients from the soil? (Tap and fibrous roots)
v. Which root system do you think would die first because of lack of water? Why? (Fibrous roots)
vi. Which root system grows vertically? (Taproots)
vii. Which root system grows horizontally? (Fibrous roots)
viii. Which root system transports nutrients to the plant's leaves for proper growth? (Tap and fibrous roots)
ix. Which root system do you think corn would have if you saw the stalks laying down in a field after a thunderstorm? (Fibrous roots)

3. PowerPoint: Go back inside and finish the powerpoint while students eat their snack. (10 minutes)

a. Fun Facts About Roots!
b. Snack: Have various edible roots in the garden for snack!

4. Have students answer the Reflection Questions in their garden journals. (5 min.)

ion Questions:

1. Why are there different types of roots?
2. What is your favorite edible root to eat?