



## Lesson 2: Root, Root Hurray!

### Lesson Objective

Students will . . .

- Try (with at least one of four senses) a root vegetable in the classroom
- Report completing **Lesson 1** Food Adventurer mission of trying a new fruit or vegetable at home or in the cafeteria.
- Try a root vegetable at home or the cafeteria after this lesson.

### Lesson Overview

There are five activities for Lesson 2.

1. **Food Adventurer, Mission Accomplished** (5 minutes)  
Students will report on the results of their Food Adventurer mission from Lesson 1.
2. **Plant Parts We Eat - Review** (5 minutes)  
Students will review the six plant parts that they learned about in Lesson 1.
3. **Carrot Demonstration** (10 minutes)  
Students will examine the parts of a carrot root that are responsible for nutrient storage and nutrient transport.
4. **Food Adventurer Adjectives - Carrot, Jicama and Orange Salad Recipe** (15 minutes)  
Students will be offered an opportunity to taste a healthy recipe.
5. **Garden Options** (20 minutes)  
Students will continue work on their mural, or indoor/outdoor garden. Choose Activity **5A or 5B**.

### What you will need

#### General Materials and Supplies

- Food Adventurer Mission Log (one per student).
- Pocket folders (optional, one per student) to collect additional student materials.
- Basic Educator Kit - Class/Garden/Food Prep (Appendix C)
- Food Adventurer Definition (Appendix A, page 1 of Mission Log)
- Fruit and Vegetable Flashcards (Appendix L)

#### Activity 1, Food Adventurer, Mission Accomplished

- Food Adventurer Mission 1 worksheet (page 7 of Mission Log)
- GHK Food Adventurer stickers (one per student) Appendix I

#### Activity 2, Plant Parts We Eat, Review

- Plant Part Poster

### Activity 3, Carrot Demonstration

- One large carrot (with greenery still attached)
- One knife, to slice the carrot lengthwise
- One cutting board

### Activity 4, Food Adventurer Adjectives, Carrot, Jicama and Orange Salad Recipe

- Access to soap, sink and paper towels to wash hands
- List of Food Adventurer adjectives (from Lesson 1, page 3 of Mission Log)
- Paper cups: Divide recipe into cups, so that it can be easily distributed to students.
- Plastic forks (one per student) for tasting Carrot, Jicama and Orange Salad
- Carrot, Jicama and Orange Salad recipe sheets (Appendix N). Recipes may also be found on the Oregon State University Food Hero website (<https://www.foodhero.org>).
- Carrot, Jicama and Orange Salad ingredients (refer to recipe)

### Activity 5A, Mural Garden Option - Adding the roots

- Art supplies for adding roots to the garden mural (crayons, paper, and/or pipe cleaners)
- GHK flashcards of root vegetables (see Appendix L)
- Garden Journal
- Clear plastic container, at least 8 inches deep. The container is a visual to observe root growth beneath the soil. Clear beverage containers or cups with flat sides work well.
- Potting soil
- Scissors
- Radish seeds
- Rulers, or popsicle sticks with ½” marked from the edge
- Markers

### Activity 5B, Indoor or Outdoor Garden Options

- Flip chart paper or board space, with list of garden rules and seeds planted (from Lesson 1)
- GHK flash cards (Appendix L) of vegetables and fruits that the class planted as seeds (in Lesson 1).
- Access to soap, sink and paper towels to wash hands
- Garden Journal pages (Appendix F; page 8 of Mission Log), pencils or pens, clipboards
- Clear plastic containers, at least 8 inches deep (1 per group). The container will be used to observe root growth beneath the soil. Clear beverage containers or cups, with flat sides, work well.
- Potting soil
- Scissors
- Radish seeds
- Rulers, or popsicle sticks with ½” marked from the edge
- Markers

### Take Home Materials

- Food Hero Recipe - Carrot, Jicama and Orange Salad (Appendix N)

Supplementary Materials (as needed)

- Crayons, storybook, journal page and/or coloring sheet (Appendix G)

## Preparation

Activity 1, Food Adventurer, Mission Accomplished

- Food Adventurer Mission 1 worksheet (page 7 of Mission Log)

Activity 2, Plant Parts We Eat, Review

- Hang Plant Part Poster (Appendix D) in classroom.

Activity 3, Carrot Demonstration

- Set up carrot demonstration (be prepared to safely slice a large carrot, lengthwise).

Activity 4, Food Adventurer Adjectives, Carrot, Jicama and Orange Salad Recipe tasting

- Set up flip chart or arrange for space on chalkboard to compile the list of Food Adventurer adjectives. Students can refer to pages 3 – 6 of their Mission Logs.
- Gather ingredients for the recipe. If available, gather carrots from the garden.
- Using safe food handling techniques, prepare the recipe.

Activity 5A, Mural Garden Option - Adding the roots

- Make sure that the mural garden is hanging in an area where roots can be added to the mural.
- Prepare the mural garden, so that images of roots can be added to the mural.
- Prepare root seed demonstration container (**see below**).

Activity 5B, Indoor or Outdoor Garden Options

- Display rules for the indoor and outdoor garden, and list of seeds planted.
- Gather garden tools
- **Root Seed Demonstration Containers**
  - Gather or prepare containers that will be used as root boxes. If using tissue boxes, cover the window with clear cellophane, using glue to adhere the cellophane to the inside of the window edges. (One box per pair of students). If brand names are visible on the container or box, cover these with tape. Enlist the help of a Master Gardener or other volunteer to make the root boxes.
  - Set out root containers, paper towels, water soluble glue, tape, markers, rulers, radish seeds and soil.
  - Talk to the Classroom Teacher to arrange for window ledge space, or table space next to a window. South- or west-facing windows are best. These sites receive the most sun.

Take Home Materials

- Food Hero Recipe - Carrot, Jicama and Orange Salad (Appendix N)

Supplementary Activities (as needed)

- Talk to the Classroom Teacher about Lesson 2 supplementary activities.

## Teaching outline

### Activity 1: Mission Accomplished

Welcome the students back. Pass out Mission Logs. *The last time we met, I gave all of you Food Adventurers a mission. Does anyone remember what your mission was?*

Allow the students to raise their hands and answer.

*Your mission was to try a new fruit or vegetable. Remember, Food Adventurers can try new foods in many different ways. We can use our eyes to see, or our noses to smell. We can use our hands to touch, or we can use our mouths to taste.*

Point to your eyes, nose, hands and mouth as you speak. Instruct students to turn to **page 7** of their Mission Logs and fill out the worksheet for **Mission 1**. Read each direction aloud, and have students fill in their answers. Call on students who have raised their hands.

- (Read) *Since the last lesson, did you try a new fruit or vegetable? What did you try?*
- (Follow-up) *Did you try it with your nose/eyes/hands/mouth? What did your eyes tell you? What did your nose tell you? How did it feel? How did it taste?*
- (Read) *Where did you try it? Was it at home, in the cafeteria or somewhere else?*
- *Did you like it? Would you try it again?*

*Good work, Food Adventurers! Remember to be on the lookout for new fruits and vegetables in the cafeteria, or at home. Some of these foods will be new to you, like the (repeat names of foods that were new to the class). Some of these foods will be ones you really like, such as (repeat names of foods that the class liked). Some will be ones that you may not have liked in the past. Please wear this sticker, to let everyone know that you tried a new food, as part of your Food Adventurer mission.*

Pass out GHK Food Adventurer stickers (or use hand stamps), and allow students to put them in their FA Mission Log or attach them to their shirts or sweaters.

### Activity 2: Plant Parts We Eat, Review

*Who can remember what we learned last time we were together?* Help the students to recall the Plant Part Poster or other activities that will remind them of the six plant parts.

*Excellent job everyone! With a partner, see if you can name all six parts of a plant. You may look at the Plant Part Poster for help. Think about how we connected plant parts to body parts to*

*help you remember. Make sure both you and your partner get a chance to say the six parts. Use your fingers to count to six, as you say the names of the plant parts.*

Allow students time to review the six plant parts with their partner.

*Is there a team that would like to share the names of the six plant parts with the rest of the class?*

Choose one pair to come to the front of the room and recite the names of the plant parts. One of the students can point to the Plant Part Poster. The other students, following your lead, can pantomime the six parts of a plant by being physically active with different parts of their body.

- **Roots**      Wiggle your feet.
- **Stem**        Move hand the length of the body to show skeleton
- **Leaves**      Shake your hands out to the side.
- **Flower**      Raise your arms above your head and point to hair
- **Fruit**        Bend your elbows and point to face
- **Seeds**        Bend your elbows and point to eyes

### **Activity 3: Carrot Demonstration**

Show students a whole carrot.

*We know that a carrot is a root vegetable. Can anyone point out the root on this carrot? Can you tell me what other plant parts you see?*

The carrot should still have its greenery, that way the students will be able to see the root, stem and leaves of a carrot.

*Can you tell me what other plant parts are missing?*

Carrots bought at the market or harvested from the garden should not have flowers, fruits or seeds.

*This carrot was harvested before it had a chance to develop flowers, fruits and seeds. These parts develop later in a carrot's life. The carrot plant uses the energy it has stored in its roots to make flowers, which are then pollinated and develop fruits with the seeds inside. When carrot plants go to seed, they're no longer tasty to eat. But, without carrot seeds, we couldn't plant more delicious and nutritious carrots in our garden.*

*I'm going to cut this carrot in half, so that we can see what it looks like inside.*

Cut the carrot in half, lengthwise, from tip to top. Show students the carrot halves.

Point to the outer, darker layer of the carrot. *Can you see the two layers of the carrot? The outer layer is darker. This is where the carrot root stores energy and vitamin A. Vitamin A gives the*

*carrot its color, and helps to keep our eyes healthy.*

Point to the inner, lighter layer of the carrot. *The inner layer is a lighter color. It's also harder than the outside layer. This is what the carrot uses to move nutrients and water into the stem and leaves.*

*Nutrients are special things we can't see in foods that our body needs for growth, energy, and to stay healthy. Fruits and vegetables are good sources of vitamins, minerals, and water. Water is an important nutrient. It carries other nutrients around the body, helps carry waste out of the body, and cools the body through sweat.*

Pass the carrot halves around for students to touch and examine.

#### **Activity 4: Food Adventurer Adjectives, Carrot, Jicama and Orange Salad Recipe**

Prior to tasting the recipe, have students wash their hands.

*We're going to try a salad with root vegetables. Eating root vegetables, like carrots, is a great way to vary our veggies. We'll then be able to taste this healthy snack. But first, before handling, preparing or eating food, we need to wash our hands! We want to make sure that we keep our hands clean. This will help to keep us healthy.*

If necessary, remind students about proper hand washing technique (Appendix B).

In this recipe, there is a fruit (oranges) and there are two types of roots (carrot and jicama). Parsnip and celeriac, which may be substituted for jicama, are also roots. Water chestnuts may also be substituted for jicama. A water chestnut is a special type of stem that grows underground and stores energy for the plant. This type of stem is known as a *corm*. If canned water chestnuts are used, rather than focusing on terminology, tell students that they are special stems, which grow underground and store energy for the plant – just like the roots we've learned about!

When it is time to taste the Food Hero Recipe, use prompts and directions associated with a Food Adventurer Adjectives worksheets (Lesson 1, Activity 2; pages 3 – 6 in Mission Logs). After students try root vegetable recipe, ask students to share Food Adventurer adjectives as a class.

#### **Activity 5A: Mural Garden Option - Adding the roots**

*Raise your hand if you remember the vegetables/fruits that we planted in our mural garden.*

Allow students to answer. Refer to the flip chart list of seed names that were planted.

*Today we are going to learn more about roots that we eat, we're going to work in groups and plant the seeds of a root vegetable, so that we can see the seeds germinate and watch the roots grow. Germination is a word that describes how plants come out of seeds and begin to grow. See root container activity instructions in 5B.*

*Now we're going to help our vegetable and/or fruit seeds in our mural garden sprout (germinate) and grow.*

*We can add their roots in the ground. This will help our plants to take up nutrients from the soil like water and vitamins and minerals.*

Point to the Plant Part Poster as an example of what the roots of a sprouted (germinated) seed may look like. Show a planted seed sprouting roots and/or visuals of roots at various stages of growth. Use GHK flashcards to show root vegetable examples.

For this lesson, you may want to have students work in the same teams they were in for the Lesson 1 Mural Garden activity.

Pass out the crayons/markers or other supplies to make the roots. Pipe cleaners are a good option for roots, as their hairs mimic root hairs, which are a part of all roots. They give the root increased surface area from which the plant can better absorb water and nutrients.

*Add roots to your plants. In the coming weeks, we will continue to help the (recite names of vegetables planted in the mural garden) in our garden grow.*

Collect mural materials when you are through.

Have students use garden journal sheets to draw and name 3 examples of root vegetables. Students can use GHK flashcards as needed.

*In the next lesson, we are going to add water to the mural.*

### **Activity 5B: Indoor/Outdoor Garden Options**

Refer to list of garden rules from Lesson 1.

*These rules have to do with the plants, garden and tools. The rules help us to be active in the garden, and to have fun safely. For example, we handle plants gently. We walk, and do not run in the garden or to and from the garden. We're careful not to step on plants. We handle tools carefully and safely. We don't touch insects or other animals unless we know it is safe.*

*To learn more about roots that we eat, we're going to work in groups and plant the seeds of a root vegetable, so that we can see the seeds germinate and watch the roots grow. Germination is a word that describes how plants come out of seeds and begin to grow.*

Have students work in pairs or small groups. If students have been learning about measurement, reinforce these concepts when students use the ruler or when they fold and divide the paper towel 'seed mat.'

Please note: If outdoors, students can plant seeds directly in soil.



Hand out the root containers, soil and paper towels.

*We're going to germinate radish seeds in a special container that will allow us to peek below the soil, so that we can watch the roots as they grow. We'll use a clear container, so that we can watch the roots as they grow underneath the soil.*

Pass out radish seeds, glue and scissors. Four students can share these supplies.

*Radish plants need room to grow, so the seeds should be planted about 1" apart. We will plant our seeds on a seed mat so that it will be easier to space them out. We will use a paper towel to make our seed mat. We can glue our seeds to the paper towel, and we will place them next to the root box window. We'll then fill our root container with soil. The seeds will germinate, and we can watch as the roots grow.*

Slowly demonstrate the next steps, and ask students to follow along. Fold a paper towel in half, four times. When the paper towel is unfolded, there should be 16 smaller squares. Use the scissors to cut the paper towel, to create four rows of four squares.

*Radish seeds need to be planted about ½" deep in the soil. You have four squares on your paper towel. For each square, use a ruler to measure ½" from the top of the paper towel.*

For students who do not know how to read a ruler, or who have not yet learned fractions, you can mark the ½" line with colored tape, or ask the volunteer or Classroom Teacher to mark the ruler with colored tape. If rulers aren't available, you may use popsicle sticks with a line marked ½" from the edge.

*Use a marker to 'dot' where a seed should be planted. This is where you will glue your radish seeds.*

One or two radish seeds should be planted in each section. Because some seeds may fail to germinate, two seeds per section provides additional insurance that a radish plant will grow. Allow time for the glue to dry, before taping the seed mat to the inside of the root box, so that the seeds are facing outwards. This will allow students to view the seeds as they germinate and grow. Students may only be able to fit two to three (out of four) seed squares in the window of the container. That's okay.

Have students work with a Master Gardener or other volunteer to fill the root box with soil and water the seeds. Take care not to wash the soil away and/or expose the newly planted seeds. Once planted, have the students label their root boxes and place them on a table or ledge next to a window, so that the seeds and seedlings get lots of sun.

*Write your name on your root container. Allow your partner to write his or her name, too. Carefully place your container next to the window, so that the seeds will get lots of sunlight. The sunlight and the damp potting soil will help your radish seeds germinate and grow. Because you planted your seeds against the edge of the container, you should be able to watch the roots as they grow. Be patient. You may see your seeds germinate, and the plant grow roots and leaves,*



*in about 5-7 days. The next time I visit you, we should be able to see the roots of the radish.*

If the Classroom Teacher allows, have the students check their root boxes each morning. The Teacher can help them to keep the soil damp, as necessary. Students can write or draw their observations on their Growing Healthy Kids journal sheet.

Have students check on the seeds that they planted in Lesson 1. They can water the seeds, if necessary, or can record observations on seedling growth in their garden journal (pass out clipboards, garden journal sheets, pens and pencils).

## Closure

*Today we learned about different roots we can eat, like carrots and radishes. We learned that the roots we eat store energy and nutrients for the plant and they can be yummy! The next time we are together we will learn about water for people and plants (point to girl watering on MyPlate Garden Poster – Appendix E).*

*Food Adventurers: before we go, I want to give you another mission. Your mission is to **TRY** a root vegetable. Remember, you can try it with your eyes, your hands, your nose—and maybe even with your mouth. Try the food with by looking, smelling, feeling, and taste it if you like. Food Adventurers - do you accept this mission? If so, shout out YES! Food Adventurers - do you accept this mission?*

Allow students to answer.

*Wonderful. I can't wait to hear your mission reports, the next time we meet.*



## Lesson 2: Root, Root Hurray! Supplementary activities

These activities are for the Classroom Teacher to do with the students before you return for the next lesson.

- **Supplementary Activity 1 - Storybook and Discussion and Journal** - Read the storybook to children and then lead a discussion on key points that connect the book to GHK messages and activities. Sample discussion questions can be found below. Children then write or color about what they learned on a journal sheet. Journal sheets will be collected and compiled into a book after the final lesson.

Storybook Option: *Carrot Soup*\*, by John Segal

\*Note, this book is most appropriate for students up to 2<sup>nd</sup> grade; teachers may want to find another book for older students (3<sup>rd</sup> grade and up).

- **Supplementary Activity 2 – Coloring Sheet** - Discuss Lesson 2 coloring sheet message and caricature drawing, and how it is connected to the messages and activities in Lesson 2. Allow children to color the sheet. Allow children to display their colored sheets on their desk/table and invite them to walk around to see their classmates' art. Coloring sheets will be collected and compiled into a book after the final lesson.

**Supplementary Storybook Activity:** Sample Discussion Questions and Journal Sheet Ideas

***Carrot Soup*, by John Segal**

### Discussion Questions

- *Why did rabbit plant carrot seeds?* (He looked forward to enjoying his favorite food, carrot soup.)
- Point out the page showing the many kinds of carrots to choose from. *What plant part is a carrot?* (Use the Plant Part Poster to illustrate the answer: roots.)
- *Did rabbit get any physical activity during the story? If so, what?* (plowing, planting, watering, weeding)
- *Is Rabbit a Food Adventurer? Why?*

### Journal Sheet Idea

- Draw a picture of soup you could make from carrots in your garden. If appropriate, give your soup recipe a name.