Lesson 4: Stand Strong with Stems

Lesson Objective

Students will …

- Try (with at least one of four senses) a stem vegetable in the classroom.
- Report completing **Lesson 3** Food Adventurer mission of drinking water when thirsty.
- Try a stem vegetable at home or the cafeteria after this lesson.

Lesson Overview

There are five activities for Lesson 4. *Note that if you choose the outdoor garden option,* ***Activity 5C,*** *Garden Stem Scavenger Hunt, you will need to adjust the sequence of activities.* ***See Activity 5C*** *for instructions.*

1. **Food Adventurer, Mission Accomplished** (5 minutes)
   Students will report on the results of their Food Adventurer mission from Lesson 3.
2. **Plant Part Poster and GHK Flash Cards** (5 minutes)
   Students will learn about stem vegetables that we eat.
3. **Elevator Up** (15 minutes)
   Students will set up a simple activity which demonstrates that stems transport water and nutrients throughout the plant.
4. **Food Adventurer Adjectives, Celery with Quick and Easy Bean Dips Recipe** (10 minutes)
   Students will try a healthy recipe.
5. **Garden Options** (20 minutes)
   Students will continue work on their mural, indoor or outdoor garden. **Choose Activity 5A, 5B or 5C.**

What you will need

General Materials and Supplies

- Food Adventurers 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 3 worksheet (page 11 of Mission Log)
- GHK Food Adventurer stickers - one per student (Appendix I)

Activity 2, Plant Part Poster and GHK Flash Cards

- GHK flash cards of celery, rhubarb and asparagus (Appendix L)

- Plant Part Poster (Appendix D)

Activity 3, Elevator Up!

- Celery stalks with leaves
- Food color
- Access to water
- Tall, clear unbreakable jar or cup (one per 4-6 students)

Activity 4, Food Adventurer Adjectives, Celery with Quick and Easy Bean Dips Recipe

- Access to soap, sink and paper towels to wash hands or hand sanitizer
- Flip chart or board and markers or chalk
- Food Adventurer Adjectives worksheet (Appendix H, pages 3 – 6 of Mission Log)
- Food Adventurer stickers (one per student)
- MyPlate Garden Poster
- Plant Part Poster
- Ingredients for making dip(s)
- Fork, potato masher, blender or food processor for making dip(s)
- Bowl(s), spoon(s) for serving dip(s)
- Quick and Easy Bean Dips recipe sheets (Appendix N). Recipes may also be on the Oregon State University Food Hero website (https://www.foodhero.org).
- Quick and Easy Bean Dips ingredients (refer to recipe).

Activity 5A, Mural Garden Option - Adding the stems

- Garden mural, from previous lessons
- Art supplies for adding stems to the garden mural
- Garden journal pages (Appendix F)

Activity 5B, Indoor or Outdoor Garden Options

- List of garden rules and seeds planted (from Lesson 1)
- Access to soap, sink and paper towels to wash hands
- Garden journal page (page 12 of Mission Log), pencils or pens, clipboard
- GHK flash cards of vegetables and fruits being grown in the garden.
- Decide which indoor or outdoor gardening activities you will do with the class (i.e. harvest, garden/grocery store comparison, garden journal, and/or propagating stems). Refer to activity description for list of supplies needed.

Activity 5C, Outdoor Garden Option, Garden Stem Scavenger Hunt

- List of garden rules and seeds planted (from Lesson 1)
- Access to soap, sink and paper towels to wash hands
- Garden journal page (page 12 of Mission Log), pencils or pens, clipboard
- GHK flash cards of vegetables and fruits being grown in the garden

Take Home Materials

- Food Hero recipe, Quick and Easy Bean Dips (Appendix N)

Supplementary Materials (as needed)

- Crayons, storybook, journal and/or coloring sheet, clipboard

Preparation

Activity 1, Food Adventurer, Mission Accomplished

- None.

Activity 2, Plant Part Poster and GHK Flash Cards

- Hang Plant Part Poster.

Activity 3, Elevator Up!

- Gather supplies.
- Talk to the Classroom Teacher before the lesson, to make sure that there is a clear spot where the celery containers can be placed, so that students can check on them over the next few days.
- With the Classroom Teacher, decide who will break down the celery set up (you, volunteer, students and/or Classroom Teacher).
- Fill jars with enough water to cover the bottom 2-3 inches of the celery.

Activity 4, Food Adventurer Adjectives - Celery with Quick and Easy Bean Dips Recipe

- Set up flip chart or arrange for space on chalkboard to compile the list of Food Adventurer adjectives.
- Gather ingredients and supplies for making dips. Prepare recipe.
- Photocopy Food Adventurer Adjectives worksheets.

Activity 5A, Mural Garden Option - Adding the stems

- Prepare mural garden activity.
- Garden journal sheet, GHK flashcards

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

- Display rules for the indoor and outdoor garden, and list of seeds planted.
- If you choose Activity 5C, anticipate that you will need to adjust the sequence of activities so that the Garden Stems Scavenger Hunt is the first activity for this lesson.
- Decide which indoor or outdoor gardening activities you will do with the class (i.e. harvest, garden/grocery store comparison, scavenger hunt with garden journal, and/or propagating stems). Refer to activity description, for list of supplies needed.

Take Home Materials

- Food Hero recipe - Quick and Easy Bean Dips (Appendix N)

Supplementary Activities (as needed)

- Talk to the Classroom Teacher about Lesson 4 supplementary activities.
- Talk to the Classroom Teacher about allowing children to check on celery over the next few days.

Teaching outline

Activity 1: Food Adventurer, Mission Accomplished

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.

Would any of you Food Adventurers like to tell me about your mission?

Ask students to turn to **page 11** of their Mission Logs and fill out the worksheet for **Mission 3**. 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 drink more water? Did you try any flavored water? What did you try?*
- (Follow-up) *Did you try it with your nose/eyes/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 drink water? Was it at home, in the cafeteria or somewhere else?*
- *If you tried flavored water, did you like it? Would you try it again?*

Good work, Food Adventurers! Remember water is an important part of your body, and you should try to drink whenever you are thirsty. When it is hot outside, or if you are running or playing, it is especially important to drink more water to avoid becoming dehydrated. Please wear this sticker, to let everyone know that you chose to drink more water as part of your Food Adventurer mission.

Activity 2: Plant Part Poster and GHK Flash Cards

Today, we will be learning more about stem vegetables. Point to the stem portion of the sunflower on the Plant Part Poster.

Raise your hand if you can name a stem vegetable that we eat.

Call on students with their hands raised. Acceptable answers include: celery, rhubarb, and asparagus. We also eat the stems of broccoli and cauliflower. Potatoes are also a special type of stem, called a tuber. Tubers are stems that grow underground, and store energy. Students may have a hard time coming up with answers on their own. In this case, you can tell them and show them examples of stems that we eat using the GHK flash cards for props.

Stems help the plant to stand strong and tall. In this way, stems in a plant are like our skeletons. Point to your legs and torso as you say this. (Refer to Lesson 1, Activity 3, when the body parts were used as analogies for plant parts.*)* *Did you know that not all stems stand up tall? Can you think of some stems that don't?* Allow students to answer. *Some are vine-like (for example, a*

watermelon stem or pumpkin stem). Yet, all stems help move water and nutrients to all parts of the plant.

There aren't very many stems that we eat. Stems are tough and firm. This helps most plants stand strong and tall - but also makes many plant stems too tough for us to digest. For example, we don't eat the stems of apple trees or blueberry bushes. We don't eat stems of sunflowers.

Point to the stem portion of the sunflower on the Plant Part Poster.

However, there are some very good examples of stems that we eat. Celery is a stem vegetable. Rhubarb is another stem that we can eat. Asparagus is another type of stem that we can eat.

Hold up GHK flash cards of celery, rhubarb and asparagus as you speak.

Activity 3: Elevator Up!

Besides helping plants to stand strong and tall, stems also help to carry water and nutrients from the roots to the leaves, and throughout the plant. Point to the Plant Part Poster and use your torso, feet and hands to help explain this concept.

In this way, stems are like the blood vessels in our bodies. Look at the inside of your wrists. Can you see the veins in your arms? They move nutrients in your blood around your body.

We're going to do an activity that will show us that stems can move water and other nutrients to all parts of the plant. Do you remember what we talked about last week? Allow students to answer - water.

Yes! We talked about the importance of water to people and to plants. Today we will see what water does when it enters a plant. Gather around your work tables/desks. You'll see that there is a piece of celery, a glass of water, and some food coloring at each station. Remember that celery is a stem vegetable, and that stems help the plant to stand strong. A plant's stem also helps to transport water and nutrients throughout the plant.

Allow students to gather around their work stations. These can be desks or tables. Each station should have 1 clear jar with water, 1 piece of celery, and 1 vial of red food coloring. Red food coloring is preferable, so that students can better see the dye within the celery.

The celery stalks should have leaves on them. The jars should have enough water to cover the bottom 2-3 inches of the celery. Do not fill the water to the top of the jar. Red food coloring vials can be shared between tables, as needed. You will need about 1/3 of a standard food coloring vial (0.25 oz per vial) per work station.

You can conduct this activity as an experiment. To do so, reserve a few stalks of celery (at least 2), which will NOT be placed in the red food coloring. One celery stalk can be placed in a glass of water, WITHOUT food coloring. The other celery stalk can be placed on the table (i.e. NOT in a glass of water, with or without food coloring). Have students predict what will happen, over

the next few days, with each of the three types of celery stalks. The celery stalks in water should remain relatively rigid, since the plants' cells will stay filled with water. The leaves of celery in colored water will change color. Those in plain water will not. Celery stalks out of water will go limp, as cells deflate in the absence of water.

We're going to let the celery sit for a few days. You will check the celery over the next few days, to see what happens. If the celery takes up the water with the dye, we should be able to see colored celery leaves in a few days.

Allow the celery to sit for a few days, until you can see the leaves turn the same color as the dye. At this time, you or the Classroom Teacher can return to this activity, asking students a series of questions.

- *Why does the celery in the jars with food coloring have colored leaves?*
- *Did the celery take the water up?*
- *What happens when you eat the celery, will you get that water in your body)? Remind students this is not for eating.*
- *Will you get the nutrients the water was carrying in your body?*
- *What happened when the celery didn't have water?*

Like an elevator, the stem helps to move water all around the plant, just as our blood vessels help to move our blood through our bodies.

Activity 4: Food Adventurer Adjectives, Celery with Quick and Easy Bean Dips Recipe

Celery is a stem vegetable. It is a good source of fiber, and also contains vitamins that we need to stay healthy. We're going to taste our celery with three different bean dips. Beans belong to both the vegetables and the protein group on MyPlate. Beans are another good source of fiber. Fiber in our diet helps to keep us healthy.

Point to the vegetables and protein groups on the MyPlate Garden Poster when talking about celery and beans. If this is the students' first introduction to the MyPlate, take a few minutes to explain the concept.

MyPlate is a picture that reminds us to eat healthy. The vegetables and fruits groups on MyPlate remind us to fill half of our plate with vegetables and fruits.

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

We're going to be Food Adventurers, and try our snack using our sense of sight, touch, smell and taste. We're going to practice using our adjectives to describe how our food looks, feels, smells and tastes.

Refer back to Lesson 1, Activity 2, for spoken prompts and directions associated with a Food Adventurer Adjectives recipe activity.

As resources (including time) allow, you may make one or all three of the bean dips. Serve with celery, to reinforce this lesson's focus on stem vegetables. In the chunky black bean dip, there are edible plant seeds (black beans), fruits (tomato, bell pepper), and leaves (onion and garlic are bulbs, and bulbs are specialized leaves that store energy for the plant). In the smoky pinto bean dip, there are edible plant seeds (pinto beans) and fruits (jalapeño peppers). In the lemony garbanzo bean dip, there are edible plant seeds (garbanzo beans) and leaves (garlic). You may want to refer to the Plant Part Poster to point out the different plant parts that are in this recipe.

Activity 5A: Mural Garden Option - Adding the stems

In the last few weeks, students prepared the garden, planted seeds in the mural and added in the roots of the seedlings. Last week, students added water to their garden. Today, ask students to add in the stems on their plants. You can give students leeway to add the stems as they like, but you may direct them to add the stems above ground. As you continue through *Growing Healthy Kids* lessons, you can add more detail to the garden mural.

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

Activity 5B: Indoor or Outdoor Garden Options

As necessary, review the list of garden rules that were generated in Lesson 1. These may be written on the board, or displayed on a piece of paper which is hanging on a wall.

If there are vegetables near maturity in an established outdoor garden, you can have students harvest, wash and taste the vegetables. If not available, have students point out stems of plants.

Garden Journal Prompts: Have students draw vegetables they see in the garden, and note how they look similar to or different from the same vegetables in the grocery store or at home. You may want to use your GHK flash cards for reference.

Do this for two or three different plants at various stages of development, to remind students that (1) we eat many different plant parts, (2) these healthy and nutritious foods come from plants, and (3) it is easy to grow a variety of healthy foods in a garden.

Before we end today's lesson) we need to wash our hands. We want to make sure that we keep our hands clean. This will help to keep us healthy.

Activity 5C: Outdoor Garden Stems Scavenger Hunt (*note, this will change the sequence of this lesson and become the first activity for Lesson 4*)
This option will work well for a lively group of students who want to explore the garden before sitting through activities that involve more sitting and listening. Students will start the lesson in the garden with a scavenger hunt of various garden stems. If your garden space does not include plants with visible stems, encourage students to explore other non-edible plants.

As necessary, review the list of garden rules that were generated in Lesson 1. These may be written on the board, or displayed on a piece of paper which is hanging on a wall.

Garden Journal Prompts: Have students do a scavenger hunt to explore the garden and other non-edible plants nearby for as many different types of stems as they can find. Ask students to draw pictures of what they find and note their similarities and differences. Encourage students to find at least three different types of stems to represent: (1) stems that stand straight and strong, (2) stems that are vines that stay close to the ground, and (3) stems that are edible and non-edible.

Once students have completed their drawings, allow them to share their findings briefly before showing the GHK flash cards of vegetables and fruits being grown in the garden and explaining the function of stems.

Modify Activity 2 Plants Part Poster and Activity 3, Elevator Up as needed to allow time for the scavenger hunt. For example, Activity 3, Elevator Up, the celery demonstration, can be modified to be an educator led, single demonstration rather than having each student set up their own experiment.

Have students wash hands and move on to Activity 4, the tasting activity.

Before we move on to another activity we need to wash our hands. We want to make sure that we keep our hands clean. This will help to keep us healthy.

Closure

Today we learned about stem vegetables. Celery, rhubarb and asparagus are all stem vegetables we can eat. Stems are the skeleton of a plant. We set up an activity that will show us how stems move water up and around the plant like blood vessels move blood through our body. You will check on your celery over the next few days. We are continuing to watch the plants in our garden grow. We will soon harvest and taste the vegetables and fruits we have grown. The next time we are together we will learn more about physical activity.

Point to kids being active on the MyPlate Garden Poster, if it is posted.

Food Adventurers: before we go, I want to give you another mission. Your mission is to find and to try a new stem vegetable at home or in the cafeteria. You can find the stem vegetable at home or in the cafeteria. You can try it with your eyes, nose, hands or your mouth. 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. Make sure to share what you learned today with your family, and to tell them about the stem vegetables that we talked about.

Lesson 4: Stand Strong with Stems
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 on 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: *How Groundhog's Garden Grew*, by Lynne Cherry

- **Supplementary Activity 2 – Coloring Sheet -** Discuss Lesson 4 coloring sheet message and caricature drawing, and how it is connected to the messages and activities in Lesson 4. Allow children to color the sheet. Allow children to display their colored sheets on their desks/tables and invite them to walk around to see others' 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

***How Groundhog's Garden Grew*, by Lynne Cherry**

Discussion Questions

- On the inside cover pages, name the edible/eatable plant parts. Use the Plant Part Poster to illustrate:
  - potato (also a tuber) – stem
  - pepper – fruit
  - chard – leaf
  - radish – root
  - pumpkin and sunflower – seeds
- *Did you see any stems in the story?* Turn to page with asparagus growing, or in the meal at the end.
- *What did the animals do with the seeds they collected from the fruits and veggies in the fall?* (dried them in the sun and then planted them to grow food in the spring – on the page showing this there are asparagus seeds which can be pointed out)
- *Are the animals Food Adventurers? Why?*

Journal Sheet Idea

- Draw a picture of an animal picking stem vegetables in the garden. If students can spell, have he or she label the names of the different stem vegetables.