



Snappy Stems

Purpose

The purpose of this lesson is to review the functions of plant stems and to demonstrate that the stems of some plants are edible.

Time

Teacher preparation:
20 minutes

Student activities:
One 60-minute lesson

Materials

For the class:

- ▶ Butcher paper or chart paper
- ▶ Markers
- ▶ Jar
- ▶ Water
- ▶ Food coloring
- ▶ Stalk of celery with leaves

For each group:

- ▶ Plate of sliced celery to eat as a healthy snack
- ▶ Toppings for celery: Peanut butter, hummus, ranch dressing, cheese

For each student:

- ▶ 3-inch section of celery
- ▶ *Celery Stems* worksheet

Background Information

Stems support leaves, flowers, and fruit. Liverworts, hornworts, and mosses are the only green plants that do not have stems. Stems can be very short, as in lettuce plants, or very tall, as in the trunks of redwood trees. Stems can be hollow, as in daffodils, or somewhat solid, as in tree trunks. Food produced in leaves through photosynthesis travels down the stems to the roots and fruits, while water and nutrients absorbed by the roots travel up the stems to other parts of the plant. Edible stems include celery, asparagus, bamboo shoots, rhubarb, and sugar cane. Other plant stems are also edible, such as broccoli and cauliflower, even though they are not necessarily grown for their stems.

Many interesting products come from stems. Granulated sugar is processed from the above-ground stems of sugar cane and sugar beets. Maple sugar is obtained from the trunks of maple trees. Cinnamon comes from the bark of trees in the *Cinnamomum* genus. Potatoes are special stems, called tubers, that grow underground.

Procedure

1. Demonstrate the function of the stem (*vascular tubes that carry water and nutrients*) by putting a stalk of celery with celery leaves in a jar of water with food coloring. Examine the celery in food coloring after a day or two to see how the leaves have changed color as a result of the xylem carrying the food coloring and water up the stem.
2. Cut a new bunch of celery stems into three-inch pieces and give each student a piece. Have students separate the vascular tubes (*xylem and phloem*) from the celery pieces.
3. Discuss the functions of the vascular tubes that the students have separated from the celery stem (*transport food and water throughout the plant*). Discuss the functions of the stem as a whole:
 - a. Supports plants
 - b. Transports water, food, and nutrients throughout the plant.
4. Have students go outside and observe a variety of stems on campus. Clarify with students whether or not you want them to pick the stems that they will be observing or simply observe them without picking the plant. Discover that stems come in all shapes and sizes.
5. Brainstorm types of edible stems that we eat.

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Content Standards

Grade 2

Science 2d, 3e

Next Generation Science
2LS4-1

History-Social Science 2.4.1

Health 1.7N

Grade 3

Science 3a

History-Social Science 3.5.1

6. Celery potluck: In advance, ask students to bring tasty toppings to class. Examples include peanut butter, cheeses, hummus, dressing, and more. Discuss food allergies and wash hands before this activity. After the celery potluck, make a bar-graph on the board that shows which toppings were most popular.

7. Help students label the parts of a celery plant on their *Celery Stems* worksheet.

Conclusion

Stems of certain plants are edible. Stems come in all shapes and sizes. Celery is a healthy snack.

Extensions

- ▶ Do a class survey and calculate the percentage of students who prefer each type of celery topping.

ELL Adaptations

- ▶ This lesson incorporates hands-on activities. Kinesthetic learning events provide an excellent learning environment for the English learner.
- ▶ Demonstrate how to set up the experiment prior to allowing students to carry out their own experiments. ELL students will benefit from observing the procedures before they get started.
- ▶ Model the *Think, Pair, Share* method: After tasting celery with toppings, have students turn to a partner and ask, “What is your favorite topping for celery?” Their partner then replies, “My favorite topping for celery is _____.”