

EarthWorks Orchard Curriculum

Parts of a Tree – Trunks

<b>Grade(s): 2-5</b>	<b>Topic: Parts of a Tree, Stems</b>	<b>Season: Any</b>
<b>Timing:</b> 60 minutes, including 5 minute RPK, 5 minute introduction, 20 minute outdoor stem observation, 15 minute indoor game, 10 minute indoor experiment setup, and 5 minute conclusion. <b>Follow Up:</b> Check back in on celery experiment every few days for the next 1 to 2 weeks and compare results to students' hypotheses		
<b>Objectives:</b> <ul style="list-style-type: none"><li>• Students can identify some vegetables they eat that are plant stems</li><li>• Students can describe the 2 main functions of trunks and stems: holding up the weight of a tree or other plant (branches, leaves, water and sugar weight, etc), and transporting water and nutrients up from the roots and sugar down from the leaves.</li></ul>		
<b>Materials:</b>  <u>For Stem Observation</u> <ul style="list-style-type: none"><li>• Large and interesting plant stalk(s) to draw and dissect (best if kids can help collect them, like sunflowers – kale or Brussels sprouts or tall thick weeds work well, too)</li><li>• “Inside a Stem” cross-section diagram with parts labeled: phloem, sapwood, bark, etc.</li><li>• Magnifying glasses</li><li>• Sharp knife to cut up stems</li></ul> <u>For Straw Races</u> <ul style="list-style-type: none"><li>• One straw set (1 cut short, 1 regular size, 1 bubble tea cut so that it is flat across, and 1 that is really 4 taped together) for each group of 4 students</li><li>• Small drinking cups, one for each student</li><li>• Pitcher of drinking water</li></ul> <u>For Celery Experiment</u> <ul style="list-style-type: none"><li>• 4 celery stalks, as fresh as possible, with leaves still on (can try other stems too, such as carnations; experiment will work better the fresher the stems are)</li><li>• 4 tall containers of water that won't fall over if they have a celery stalk inside</li><li>• Other “stem-like” objects (pencil, chopstick, straw, string)</li></ul>		
<b>Degree of need for extra teacher or parent helper?</b> Medium		
<b>Journal Prompt:</b> Why are stems important for plants and trunks important for trees?		
<b>Lesson Sequence:</b>  <b>Reactivate Prior Knowledge (5 minutes)</b> Show students the celery stem. What part of the plant is this? How do they know? What are other stems that they eat?  <b>Introduction (5 minutes)</b> Review the build a tree lesson, emphasizing the trunk. Show the students a stalk of celery and have them confirm that celery is a stem, while we call the stem of a tree a trunk. Ask students what are the two jobs of stems and trunks. They will probably guess the first, which is supporting the branches and leaves, just from how stems and trunks look.		

Explain that as well as supporting, the stem or trunk transports two things. Just like the word 'transportation' describes cars or buses on a highway, the stem is like the highway in the plant carrying things back and forth. Ask the students what travels up in the stem and what travels down? Where are those things coming from? If they need help, remind them about the xylem and phloem in the Parts of the Tree game. Show them the diagram of a cut stem and explain that you are going to go outside to look at some cut stems more closely.

### **Outdoor Stem Observation (20 minutes)**

As a class, collect some large stems in the schoolyard if possible (sunflowers or large, thick weeds work well) or bring some large stems from a garden or empty lot. Cut them open (try to cut some as cross-sections and some lengthwise) as a class. Pass out a piece of stem to each pair of students to look at inside and outside with magnifying glasses and to draw. See if students can find and label the different parts: phloem, sapwood, and bark. Together as a class, have each pair find and point at the different parts of their stem.

### **Stem Experiment 1: Straw Races (15 minutes)**

This experiment is designed to help the students think about the energy it takes to transport the water (and sugar and nutrients) to different parts of a plant through a stem. In each group of 4, give each student a different length or diameter of straw. Ask the class if they think the straws will have any impact on how quickly they can drink the water and whether some will be harder to use, and have them vote on which straw will be fastest and which will be the slowest. Give each student a small glass of water and tell them that they are going to have to drink as fast as they can but they must wait until you say 'go'. Tell the students that as soon as they finish their glass of water (THROUGH THEIR STRAW) they need to stand up silently so that we can record who finished first. Record the results and then compare with the class as a whole. Try to draw conclusions about how this would relate to a plant. Does it take more energy (did you have to suck harder) to suck water up a wide straw?

### **Stem Experiment 2: Dyeing Celery (10 minutes)**

What is a stem's job? Tell the students that they are going to do an experiment. They are going to see if celery (a stem) can do its job in their classroom. Show them the stalks of celery and the containers of water. As a class, brainstorm *predictions* about what they think will happen if the stem does its job with each color. This experiment works best if there is lots of food coloring in the water, if the celery is fresh, and if there are still leaves on the celery. At each table group, have the students set up their experiment with different colors of food coloring with one stalk of celery and one other stem-like object to compare with. Make sure to keep your eye on evaporation in the containers and to store them in a safe place where they won't spill, and to check in on them every few days for the following week.

### **Conclusion (5 minutes)**

What are the different jobs of a stem? How is a stem like a straw? What do you see when you cut open a stem? What are some stems that we eat? What is the word for a trees' stem?

### **Vocabulary**

Experiment  
Heartwood  
Phloem

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Predict  
Sapwood  
Stem  
Support  
Transport  
Trunk  
Vein  
Xylem

**Vocabulario**

Albura  
Duramen  
Experimentar  
Floema  
Predecir  
Sostener  
Tallo  
Transportar  
Tronco  
Vena  
Xilema

**Extensions / Homework Ideas:**

- Have students create stem analogies: A stem is like an elevator. A stem is like a straw. Have them draw pictures to illustrate them.
- Have students do the Stem Scavenger Hunt