

Totally Trees

Grades: Elementary (3-5)

Key Words and Definitions

XYLEM	The tissue within a plant in which water travels through to get to the leaves
PHLOEM	The tissue within a plant in which food travels throughout the plant from the leaves
PHOTOSYNTHESIS	The process by which water and sunlight are transformed into usable plant energy
DECIDUOUS	A variety of tree that sheds its leaves in the fall
EVERGREEN	A kind of tree that keeps its leaves all winter
LOBES	The rounded projections or knob-like shapes seen in certain deciduous leaves

Pre-Field Trip Activity: Leaf Water Experiment

One 20-minute session; pre-visit

Learning Objective

Students will build on their existing knowledge of the purpose of leaves, then create and test a hypothesis about the movement of water through the leaf.

Materials

- Leaves
- Food coloring
- Cups of water
- Scissors

Procedure

1. Ask students if they know why trees have leaves. What are they used for? We will be learning about and looking at many leaves during our field trip to Wave Hill. Does anyone know the names of any trees or leaves they have seen before?
2. Leaves produce the tree's food by absorbing sunlight and receiving water from the tree's roots in order to execute the process of photosynthesis. You can introduce the words xylem and phloem if you'd like—xylem is the tissue that water travels through to get to the leaves of the plant. Phloem transports food throughout the plant from the leaves. In this experiment, we'll be viewing the xylem at work. Skip the vocab if your students are a bit younger or you want to keep the experiment simpler.
3. Introduce the experiment—we'll be trying to track the movement of water through a leaf by using food coloring. Ask students to make a hypothesis about what they think will happen when we place the end of a leaf into a small cup of colored water. Where will we see the color appear in the leaf? How long will it take for the color to show up? Make a list of these predictions on the board or a large piece of paper you can save.
4. Divide the class into groups, each group getting one leaf and one cup—try to vary the leaves you choose, picking different shapes and sizes of leaves. You can also mix things up by adding fall leaves that have changed color. Can we expect these leaves to transport water as well as the green ones?

5. Instruct students to clip off the bottom of their leaves, then add a drop of food coloring to their water. They can then place the clipped bottom of their leaf into the water and set cups by the window or in another safe place. You can take pictures and continue to return to the experiment within the next several hours and days, documenting and observing the changes in the leaves to see where the water travels!
6. To save time, you can pre-cut leaves for students and add food coloring ahead of time.

Sources

 [Science for Kids: Exploring How Water Travels Through Leaves - Buggy and Buddy](#)

Post-Field Trip Activity: Design A Leaf

One 20-minute session; post-visit

Learning Objective

Students will identify physical characteristics of common native tree leaves, learn why some trees have needles and some do not, and demonstrate their understanding of this information by designing their own leaf.

Materials


- Paper
- Pictures of leaves (can print from the pictures linked in resources)
- Drawing materials (pencils, pens, markers, colored pencils, etc.)

Procedure

1. Spend some time as a class examining a few different kinds of leaves, either printed out or on the board (images can be found under resources).
2. Ask the class if they remember seeing any of these leaves at Wave Hill. Which kind of leaves did they see the most of? Were there any that they are just seeing for the first time?
3. Why might some trees have needles instead of leaves? Remember what we learned during the field trip—evergreen trees keep their leaves all winter, and they don't want their branches to break under the heavy snow. Needles make it easier for snow to slip off the tree without harming the branches.
4. Tell the class that it's time for them to design their own leaf. They can draw a big picture of one leaf, or an entire tree full of leaves if they like. They will have to explain why they made their leaf look the way it does—do they want their trees to lose their leaves in the fall or keep them all winter? Do they want their leaves to change color or stay green? How many lobes will their leaves have (lobes are the little knobs on deciduous tree leaves, like maple or oak leaves; deciduous trees lose their leaves in the fall, while evergreen trees keep them year-round)?
5. Students can share their leaves and their design choices (what color they made their leaves, how many lobes they added, if their leaf is deciduous or evergreen) with the class if there is time.

Resources

 [Maple leaf](#)

 [Oak leaf](#)

 [Cedar leaf](#)

 [Pine leaf](#)



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