



Tree Vests

Focus/Overview

Trees are important for multiple reasons. Besides being aesthetically pleasing trees provide us with oxygen and products we use on a daily basis.

Student Objectives

The student will

- Learn the functions of trees and products made from trees
- Learn the different parts of a tree

Louisiana Grade Level Expectations

3: 36. Compare structures (e.g., roots, leaves, stems, flowers, seeds) and their functions in a variety of plants (LS-E-A3)

4: 40. Explain the functions of plant structures in relation to their ability to make food through photosynthesis (e.g., roots, leaves, stems, flowers, seeds) (LS-E-A3)

5: 26. Identify and describe ecosystems of local importance (LS-M-C3)

Material List

- Large brown paper bags
- Straws
- Yarn
- Leaves or the foliage coloring sheet
- Markers or crayons
- Sticks
- Staplers
- Glue

Grade Level

3-5

Duration:

45 minutes to 1 hour

Setting:

The entire lesson can be completed in a forested area or in a classroom.

Vocabulary:

Xylem, phloem, phototropism, photosynthesis, anthocyanin, chlorophyll, xanthophyll

- Tape
- Scissors

Background Information

Trees are beneficial to both humans and animals. Through the process of photosynthesis trees manufacture oxygen which all living creatures breathe. Trees provide shade to humans and animals. Trees provide shelter to animals, insects and birds. After processed, trees provide many useful things to people including lumber to build housing and furniture, paper and paper products such as toilet paper and tissue paper, aspirin, toilet seats, ping pong balls, oils, mulch, golf tees and egg cartons to name a few. In order to appreciate and protect trees in our ecosystem, we must understand how they function. There are many trees in Louisiana and they vary in height, spread, leaf shape and color and life span. Trees even have different requirements for environmental factors such as amounts of water and sunlight that they require. The largest cypress tree in the US is located on Cat island. It is approximately 800 years old! The Bald Cypress (*Taxodium distichum*) is the state tree of Louisiana. But all trees have the same basic structures. Bark serves as a protective coating, foliage to produce food through the process of photosynthesis, roots for obtaining water which is critical to growth, survival and photosynthesis. Roots also play a role in soil erosion, and act as a support to hold the tree upright and in place. , and xylem and phloem tubes which transport water and sugar/ carbohydrates manufactured in the leaves through photosynthesis. Tree foliage is usually green. However in the fall different colors start appearing. These colors or pigments are present in the tree year round but are masked by chlorophyll. As the season changes to fall and winter less sunlight (in terms of hours and intensity) is available. Chlorophyll is no longer being processed at a high rate so the other pigments begin to show. Eventually these leaves will die and fall off the tree. Some cool Louisiana tree facts from the Louisiana Forestry Association include:

- "Forests cover 14 million acres, about 50% of Louisiana's land area, making it the state's greatest single land use"
- "In 2011, there were 148,000 owners of Louisiana forestland"
- "In 2010, forestry accounted for 57% of the total value of all plant commodities grown in Louisiana, including cotton, feed grain crops, fruit, soybeans, sugarcane, and others."
- Louisiana landowners (industrial and non-industrial) reforest the land each year with over 128 million seedlings, an average of 410,000 trees per day (six-day week), and at least 29 trees for each Louisiana citizen"

- "In 2010, 811.9 million board feet of sawtimber and 6.3 million cords of wood were harvested compared to 710 million board feet of sawtimber and 6.1 million cords of wood in 2009"
- "Louisiana's forests support some 180 primary wood-using industries (such as sawmills and paper mills) located throughout the state and 750 secondary wood-using industries (including furniture manufacturers, cabinet makers, millwork plants and others that use the products produced by primary wood-using industries)"

Advanced preparation

Print out enough copies of the foliage worksheet, if you do not plan on taking a hike with students through a wooded area. Gather all supplies on several tables for students to work on. If hiking, have tables set up outside or complete the activity in the classroom. Pre-mark the paper bags so that students simply cut out the dotted lines (See the making a tree vest worksheet).

Procedure

1. If weather, time and location permit take a hike in a wooded area. As you walk through the wooded area ask students what benefits a tree provides to animals and people.
2. Continue the discussion asking how a tree survives without the capability of physically moving from one location to the next. Discuss photosynthesis and how a tree manufactures its own food.
3. Continue the discussion asking students if they know the basic parts of a tree. Discuss bark, roots, foliage, xylem and phloem.
4. If time permits discuss the changing color of a tree's foliage.
5. Allow students to collect leaves and sticks or bark peelings as they walk.
6. Bring students to the area where they will make their tree vest.
7. Have all supplies available on the tables. Tell students that they will make a vest which they can wear that will transform them into a tree!
8. First have students cut out the portions of the brown paper bags that you drew to make the shell of the vest.
9. Next explain the different structures of the tree starting with the roots. Discuss why roots are important and describe the functions. Attach long pieces of yarn to the bottom of the vest (like fringe) to represent the roots.
10. Discuss the importance of bark. It protects the inter layers of the tree from animals, people, forest fires and environmental conditions. Draw swirls

on the outer portion of the vest with brown markers and crayons, or glue and tape sticks and bark peelings to the outside of the vest.

11. Discuss the importance of foliage. Leaves or needles manufacture food for the tree from the sun through the process of photosynthesis. You will notice that trees on the outer limits of a wooded stand usually lean towards the clear land because they are growing towards the sunlight. We call this phototropism. Some trees need more light than others to produce food. Attach the leaves you collected (or colored) to the top portion of the vest over the shoulders using staplers or tape and glue.
12. Discuss the importance of the xylem and phloem. These conductive tubes enable a tree to transport water from the roots all the way to the leaves and carbohydrates manufactured in the leaves through photosynthesis from the leaves to the rest of the tree. Using tape, have students tape the straws to the inside of the vest. Also have them draw arrows to remind them that these conductive tubes transport water and food up and down the tree.
13. Once the tree vests are complete allow students to wear them. Ask them to model their vests and explain each parts of function of the tree.

Resources

Project Learning Tree

The Louisiana Forestry Association



Photo by Kiki Fontenot

Making a Tree Vest

Step 1. Mark the front side of the bag as shown in Figure 1.

Step 2. Mark the back side of the bag as shown in Figure 2.

Step 3. Mark the inside folds of the bag as shown in Figure 3.

Step 4. Cut the lines on the brown paper bag as shown in Figures 4-6.

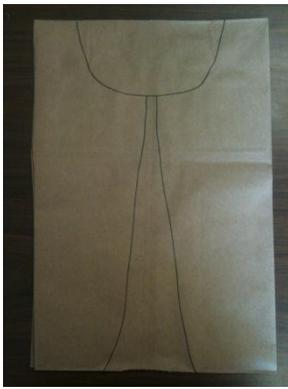


Figure 1. Front of vest



Figure 2. Back of neck hole



Figure 3. Side arm holes



Figure 4. Front neck hole and opening cut



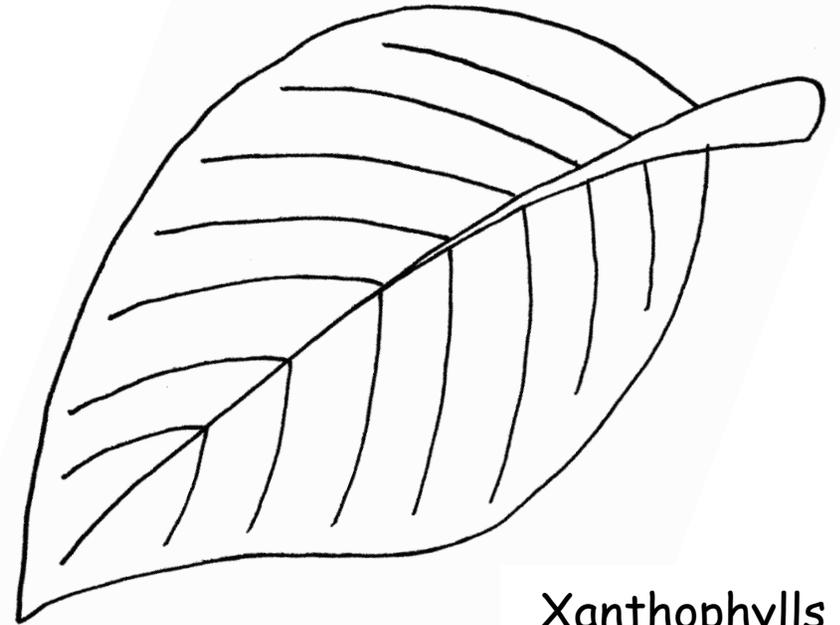
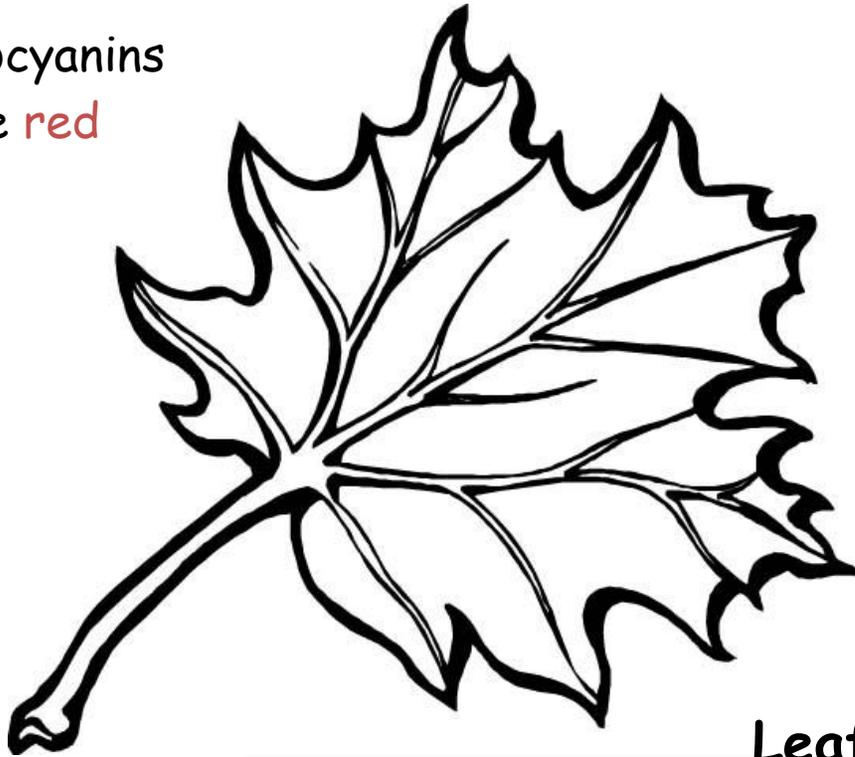
Figure 5. Arm hole cut.



Figure 6. Finished vest

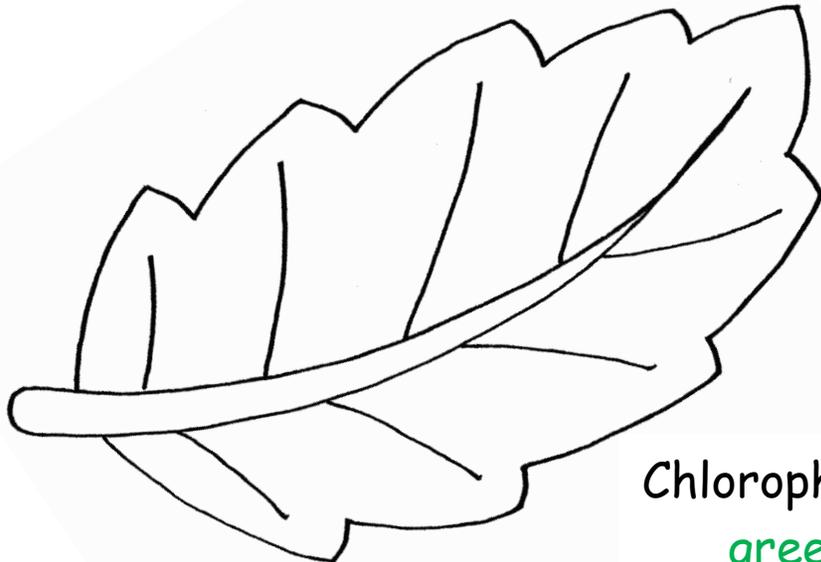
Foliage Coloring Worksheet

Anthocyanins
are red

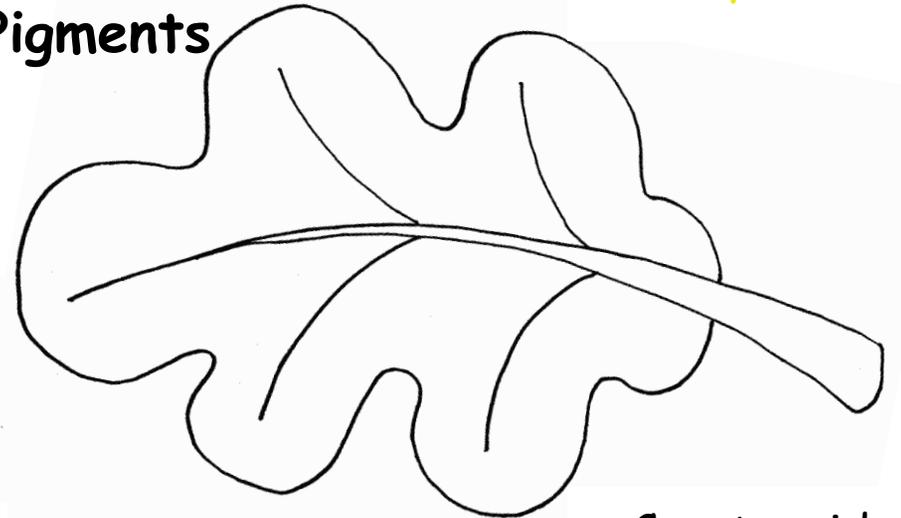


Xanthophylls
are yellow

Leaf Pigments



Chlorophyll is
green



Carotenoids
are orange