



TREE TRAILS

2-1

★ SECONDARY ★

★ TREE STRUCTURE AND FUNCTION ★

Trees are living organisms with many specialized structures – leaves, roots, wood, and the living cells that connect them. Understanding how trees are constructed and grow is essential to care for trees and calculate the benefits that trees provide.

Goal and Objectives

Goal: Students will explain how tree parts are structured to function for the tree.

Objectives: Students will

1. Differentiate tree structure parts and explain their function.
2. Describe how a tree grows, produces food and distributes it.
3. Demonstrate how a tree grows, produces food and distributes it throughout the tree.

Materials

General

- Tablet(s) or computer(s) with internet access
- Projector and screen
- White board or chart paper and markers
- Tree Trails Portfolio, Student Learning Log/Journal

Handouts

- Tree Parts

Activity Materials

- Materials for video set construction
- Cameras or camera phones

Time and Internet Links

Instructional Time: 2-3 sessions, 45 minutes each

- Trees of Texas, How Trees Grow
<http://texastreeid.tamu.edu/content/howTreesGrow/>
- Keep America Beautiful Student and Leader Guides
The Social Blast lesson
<https://www.kab.org/our-programs/education/student-and-leader-learning-guides>



Instructional Procedures

I. Engage/Excite

1. Provide students with the Tree Parts handout to take with them outside as they observe the parts of their trail tree; specifically observe the crown, leaves, branch, flowers/seeds, trunk, bark, and roots. They should take pictures and/or make drawings of their tree.
2. When they return to the class with their pictures, drawings and notes, they should label the parts and discuss their specific Tree Trail tree functions.
3. Ask students what they Want to know about tree parts and list on a whiteboard/chart or in their journal.

II. Explore

1. Select student volunteers to draw a large tree outline on bulletin board paper. Divide the "tree" into sections: a. crown, b. leaves, c. branches, d. flowers/seeds, e. trunk, f. bark, g. roots including lateral roots and root hairs.
2. As a mnemonic device, students may give alternate names to their trees parts; i.e., its hands, its hair, its feet, its shoes, etc.

III. Explain

1. Divide the class into seven groups to expand their research of the seven sections of the tree drawing. They may use the Trees of Texas website and click on How Trees Grow to research their assigned part. They will need to pay particular attention to the underlined words and definitions.
2. Then each group should present their findings. Each group should develop and include an assessment to check other students understanding of their research. It may be a question and answer session, a checklist, a fill in the blank, etc.

IV. Extend/Elaborate

1. To extend their research, students will produce a video skit or another media genre found in the Keep America Beautiful Leader Learning Guide lesson "The Social Blast."
2. Ask students what positions of responsibility are needed to produce a video skit or other media genre. List their responses and ask for volunteers to assume the responsibilities. For the skit, prompt



IV. Extend/Elaborate continued

- them to include these kinds of roles: 1. Skit writers, 2. Rap or song writers for lyrics and music, 3. Set designers, 4. Prop constructionist, 5. Materials assemblers, 6. Producer and Director, 7. Video Recorders, etc. Develop a similar list for other media genres.
3. Write the skit and song about what each part does. The skit should be the performance of the part while the students are singing their song. The music and lyric composition of the song may be determined by the students.
 4. Have students present the video skit and invite guests as deemed appropriate.

V. Evaluate

1. Have tree trail groups ask questions to the rest of the class about their tree's part and its function such as: "Can you name my part that carries water from the roots? Can you tell how I make food?" Other groups can chime in with additional or corrective responses.
2. Ask students to draw a tree, label the parts and name the function of the different parts. Have students share in pairs or triads and add or correct the drawing. Have students save their drawings and descriptions in their portfolio and/or learning logs.
3. Ask students what they Learned and list on the whiteboard/chart or in their journal.

VI. Extra Mileage/Attention

Extra Mileage: Have students draw a tree, label the part they would want to be and write a paragraph about why they want to be the part.

Extra Attention: Have students work in small groups to compare a tree to a factory, such as an auto manufacturing facility, and list the likenesses and differences.

Tree Trails curriculum was developed by Texas A&M Forest Service in cooperation with Texas Urban Forestry Council and was supported by grants from the USDA Forest Service and Keep America Beautiful.



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Tree Parts

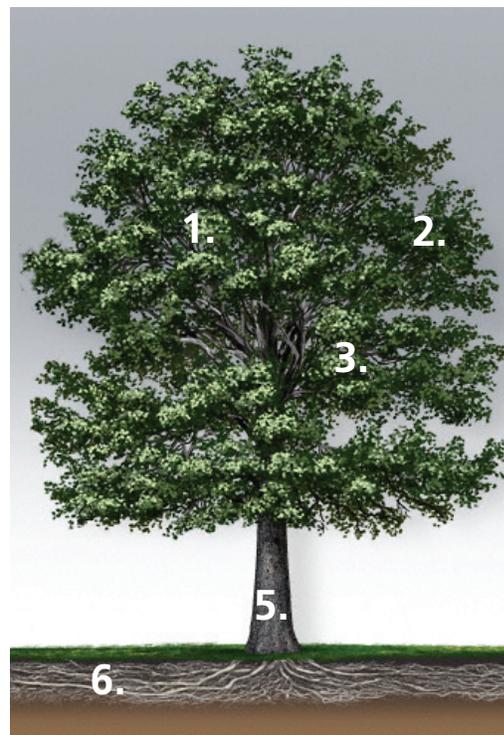
1. **Crown:** (head) part of the tree that consists of the leaves and the branches at the top of a tree.

2. **Leaves:** (fingers) food factories of the tree. The leaves contain chlorophyll which gives leaves their green color and is responsible for photosynthesis. During photosynthesis, leaves use solar energy from the sun to transform carbon dioxide from the atmosphere and water from the soil into sugar and oxygen producing a chemical change. The sugar (which is the tree's food) is either used or stored in the branches, in the trunk, or in the roots. The oxygen is released into the atmosphere. Leaves clean the air and use energy from the sun to produce food for the tree.

3. **Branch, Twigs and Boughs:** (arms) A branch is a woody part of the tree connected to, but not part of the central trunk. Large branches are known as boughs and small branches are known as twigs.

4. **Flowers and Seeds:** Flowers produce seeds. Seeds are the primary way that trees produce new trees. Seeds vary greatly in size and shape.

5. **Trunk:** Provides support and is used as "pipes" to transport nutrients to the leaves and sugar from the leaves to the rest of the tree.



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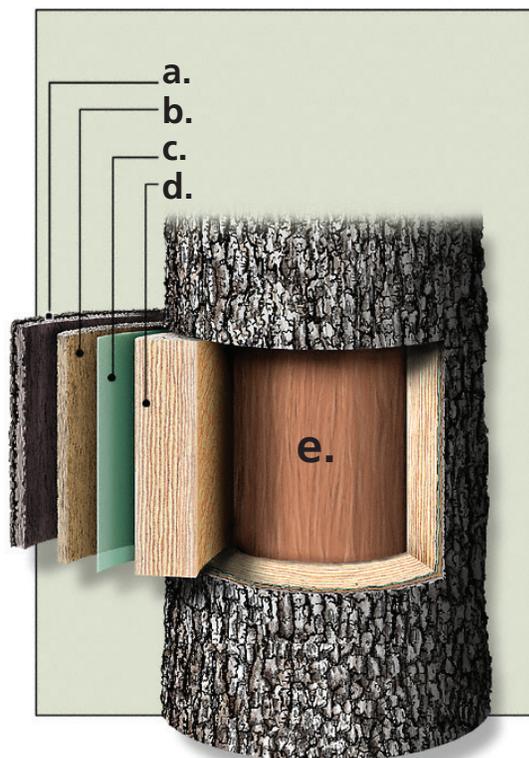


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Parts of the Trunk are

- Bark:** (skin) protects the tree from injury by animals, diseases, fire, etc. and has a variety of characteristics such as thin, thick, spongy, rough, smooth.
- Inner Bark or Phloem:** (arteries) inner bark that carries sap from leaves to rest of tree.
- Cambium:** (veins or artery tissue) a thin layer of growing tissue between the xylem and phloem.
- Sapwood or Xylem:** (veins) brings water and nutrients up from the tree roots.
- Heartwood:** (skeleton) forms the core, is made of deadwood and provides strength.

6. **Roots:** (feet) holds the soil in place, anchor the tree in the ground and absorb water and nutrients from the ground. The roots include lateral roots, rootlets and root hairs.



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