



Lesson 1- Trees are Important Upper Elementary



Lesson Outcomes:

Students will understand...

- Tree structure and their function within the tree
- that trees are critical for the health of rivers and streams
- that trees provide habitat for animals
- that we live within the Chesapeake Bay Watershed

Students will be able to...

- define native tree, phloem, xylem
- investigate the importance of trees in their local community
- analyze the parts of a tree and the species they are planting
- locate where they will be planting trees at their school

Duration of Activity & Setting: 50 minutes; Indoors

Vocabulary:

Bark, branches, bud, cambium, Chesapeake Bay, conifer, deciduous, flower, heartwood, leaf (leaves), native tree, soil, seed, species, phloem, trunk rainwater, roots, xylem, watershed

Materials:

Tree poster
Magnets
Game boards for “The Functions within Tree”
Classroom copies of “Parts of a Tree” worksheet
Images of tree species being planted

Essential Questions:

1. What is a native tree?
2. What types of resources do trees provide for wildlife and humans?
3. How do trees play a role in keeping our streams clean and healthy?

Lesson Procedure:

1. Introduce yourself and tell the students they are going to be learning about trees today, but first ask students if they know what watershed they live in.
 - a. Provide the definition of a watershed. *The area of land where water travels to one place, a river, lake, or stream.*
 - b. If we live in the Chesapeake Bay Watershed where does all of the water that falls on land end up eventually? The Chesapeake Bay!

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- c. Does anyone know what major river in this area empties into the Bay? *Use the location around you; the Potomac River is the likely answer.*
2. Ask students: Why do you think trees are important? Call on a collection of students to share their thoughts. *Trees are important for providing oxygen, preventing erosion, slowing and absorbing excess stormwater runoff pollution, absorbing excess nutrients from fertilizers on lawns or farm fields, and their shade keeps the ground and streams cooler for humans and aquatic life.*
3. Tell students that they will use all of the information presented today during the tree planting at their school later in the season.
 - a. Describe the location of the tree on the school grounds
 - b. Expand on the role these trees will play at the school, for the environment, and the community.
4. Students will be planting only native trees on the school grounds. Ask students if they know what a native tree is. *A native tree is one that has grown in a given area over time. It is accustomed to the habitat, climate, and soil conditions of the area. It is balanced with the ecosystem for the specific area.*
 - a. Show students the photos of the tree species that will be planted at the school
 - b. Expand on them being native to the region and if they are conifers or deciduous trees
5. Handout the “Parts of a Tree” worksheet to students and hang the poster on the board. Tell the students that they will be working together to identify all of the parts of a tree. Also, tell students that they will be playing a game follow the identification process and that you would be giving clues for the game answers throughout the lesson so they needed to pay really close attention!
6. Students will follow along and write the answers on their worksheet as you identify each part as a class. Tell students that there is a word bank on the side to help with spelling.
7. Begin with the easier parts to identify such as the roots, seed, leaves, flower, branches, etc. leaving the center of the tree for last.
 - a. Point to a part on the tree and ask students to identify it. Once they give the correct answer you can either have that student come to the board and place the answer on the Velcro or you can do it yourself. After getting the answer placed on the board, ask students what they believe this part of the trees does for the tree. Give hits to the answers in the upcoming game.
 - b. Examples for the basic structure:
 - i. Roots. The roots help to hold the tree upright in the ground, keep soil from eroding, and absorb water and nutrients for the tree.
 - ii. Leaf. Photosynthesis occurs here and that process creates the food for the tree.
 - iii. Flower. Ascetically pleasing, important for pollinators to exchange pollen, and enables the tree to make seeds or fruit.
 - iv. Seed. The next generation of trees and is food for wildlife.
 - v. Branch. Provides a location for animals to create homes, spreads out the leaves so they can all get sunlight.
 - vi. Bark. Protects the tree from any damage.
 - c. Examples for the inside of the tree. Students need more help with understanding these; have students repeat aloud the name of each part. Work from the outside to the inside.
 - i. Phloem. Moves sugars (food) created in the leaves **DOWN** the tree.
 - ii. Cambium. This makes new phloem and xylem cells for the tree. It is found in-between the two layers.

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- iii. Xylem. This transports water from the roots **UP** the tree.
 - iv. Heartwood. Provides support for the tree and is actually dead wood at the very center of the tree.
8. Ensure the students filled in all of the answers on their worksheet and have them place them to the side.
9. Separate the class into two teams. You can call them team A and team B or any names you choose. You are welcome to keep score or not depending on the students.
10. Explain the rules of the game before passing out any materials to students.
 - a. Each team will get “The Function within Tree” game board. Each board has the same pieces just in different locations on the board.
 - b. Explain that one card will match up with one part of the tree on the board and that’s why we talked about the role of each tree part while identifying the parts.
 - c. They will need to work as a team. The instructor will name a part of the tree, the students will need to have the correct function that part plays within the tree, and be the first team to raise their hand to share their answer. *It is the instructor’s duty to call on the team they believe raised their hand first.*
 - d. If the team does not have the correct answer it can then be passed to the other team to answer. If you are keeping track of the score the second team would have a chance to steal the point.
 - e. If no correct answer is given, move on to the next part and come back to it later in the game.
 - f. The group that answers correctly will place their game piece on the board next to the corresponding part.
 - g. Each group will be given five minutes to work as a team prior to starting the game. This time should be used to start matching up the game cards with the tree parts. This helps to ensure they have familiarity with the answers and keeps the game moving forward.
11. Hints for successful game play:
 - a. Encourage the students to each have a game piece and know their tree part for the card. They can work as a team in the time given to get the answers prior to starting the game.
 - b. The team that did not add their card to the board should move it off to the side or reattach it to the game board so it is known that it is out of play and cannot be used for future answers.
 - c. Ensure that students are listening to the answer read by the team that raised their hand first. They could have the wrong answer and do not want to repeat the same answer they just gave losing the point. (if score is being kept)
12. Clean up game and review with answering the essential questions.
13. Notify students that the next time you see them they will be planting their trees at the school.

Identifying the Parts of a Tree

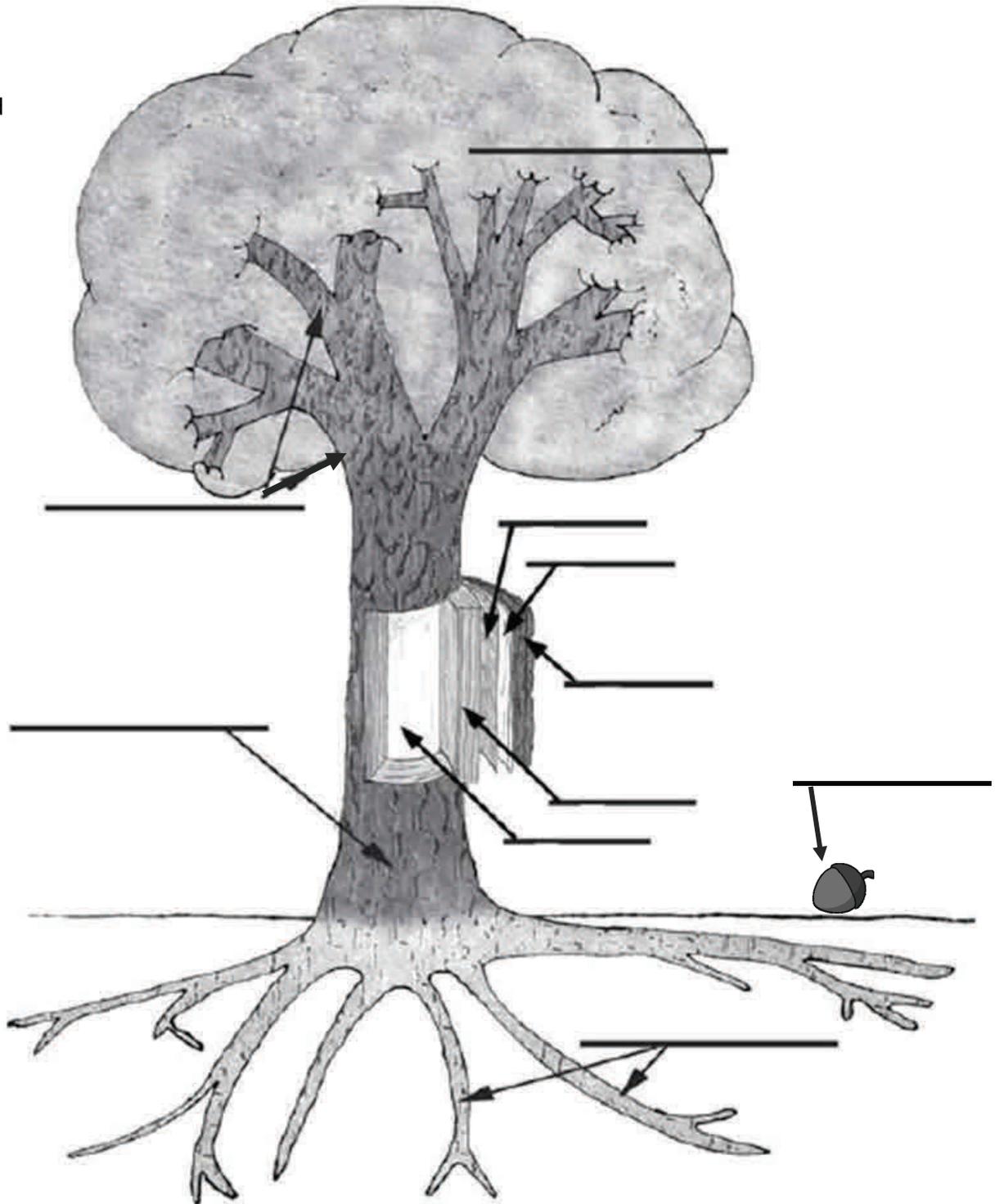
Name: _____

Date: _____

Class: _____

Tree Parts

- Bark
- Branch
- Cambium
- Heartwood
- Leaf
- Phloem
- Root
- Seed
- Trunk
- Xylem



Identifying the Parts of a Tree

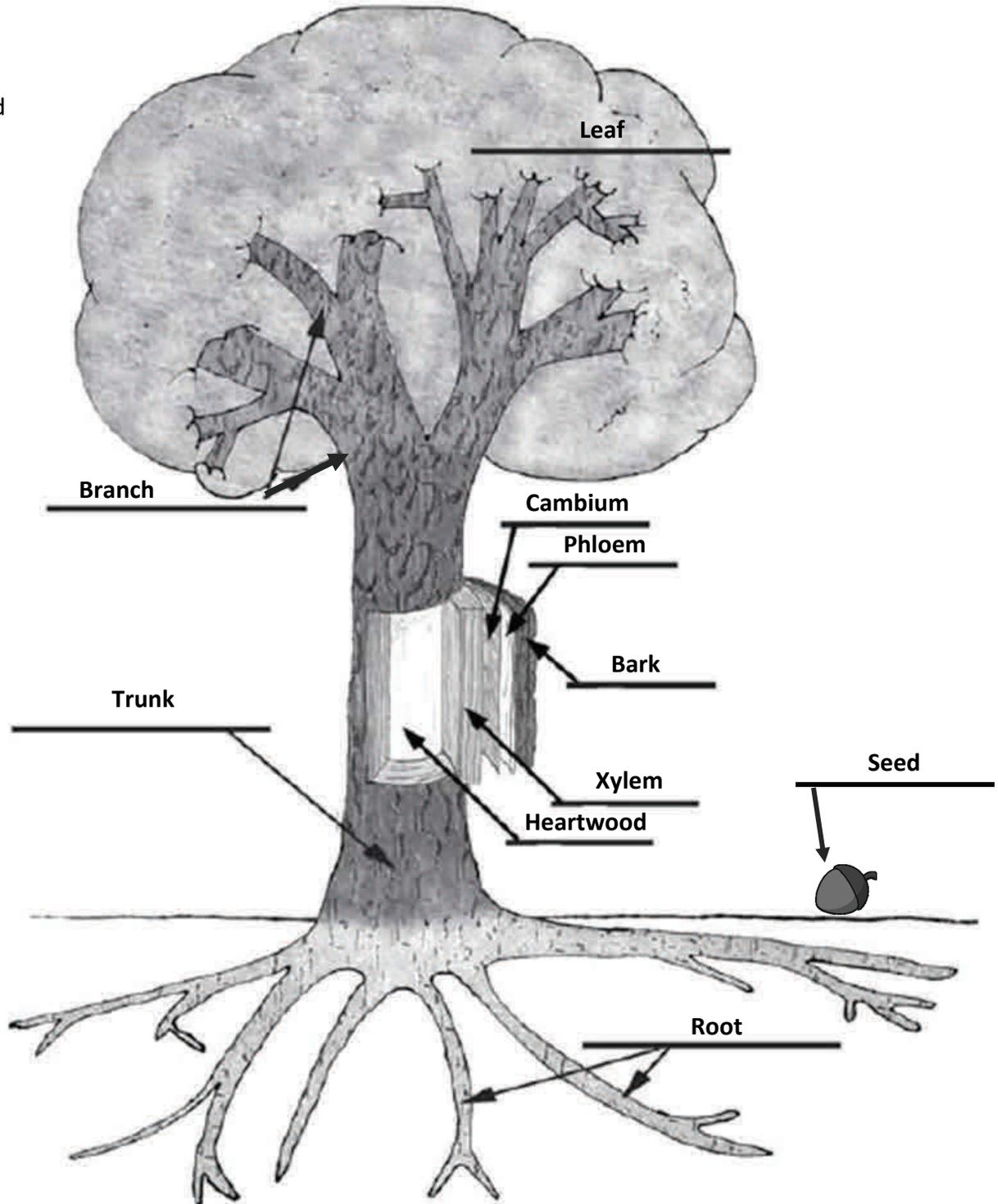
Name: Teacher Guide

Date: _____

Class: _____

Tree Parts

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- Branch
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- Root
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Tree Cards Answer Key

TREE PART	FUNCTION WITHIN TREE	FUNCTION WITHIN ECOSYSTEM
Leaf	Captures sunlight and carbon dioxide to produce food for the tree, using the process of photosynthesis	Provides shade and evaporates water; absorbs carbon dioxide and releases oxygen; provides food for animals and insects
Bark	Outer layer of the tree that protects it from weather, animals, insects, fire, and disease	Provides habitat and food for many insects; when decomposing, releases nutrients back into the soil; may be used for paper products and mulch
Trunk	Grows to bring leaves above competing trees so they are in contact with sunlight; supports branches	Stores carbon dioxide, reducing greenhouse gases; provides material for products such as paper and furniture
Root	Absorbs water and nutrients from the soil and anchors the tree in the ground to provide support	Holds soil in place so the tree does not wash away in rain and wind; takes up nutrients in the soil
Flower	Exchanges pollen with other trees to fertilize the next generation; enables the tree to produce seeds	Provides food in the form of nectar to bees, birds, and other pollinators
Seed and associated parts	Contains an embryo and nutrients to produce new offspring/trees	Often a source of food for wildlife and humans; may be used for medicinal purposes, dyes, or cosmetics
Phloem	Transports sugars (food) from the leaves down to the roots and branches; also called inner bark	Transfers sugars (food) the tree creates from sunlight, water, and carbon dioxide, making this energy available to the ecosystem (including humans!)
Xylem	Transports water and nutrients from the roots up the trunk to the leaves; also called sapwood	Absorbs water from the ecosystem and stores it for use in dry times; produces sap such as maple syrup
Branch	Spreads out leaves so they receive sunlight; where upward growth takes place and new buds are formed	Provides habitat for animals and insects; organic material for soil; and shelter from wind and rain
Cambium	Found between the phloem and xylem, a “growth layer” of cells that produces a new layer of xylem and phloem each year	Protects forests by enabling the tree to grow strong for protection from wind and storms; produces pectin, used in jellies, jams, and candies
Heartwood	Provides support for the tree; actually dead wood at the very center of the tree	Strong wood ideal for building materials; may eventually hollow out from the center of the tree and provide prime animal habitat



Tree Cards: Tree Functions

(Print two copies on yellow paper and cut into 22 individual cards)

<p>Captures sunlight and carbon dioxide to produce food for the tree, using the process of photosynthesis</p>	<p>Outer layer of the tree that protects it from weather, animals, insects, fire, and disease</p>	<p>Transports water and nutrients from the roots up the trunk to the leaves; also called sapwood</p>	<p>Spreads out leaves so they receive sunlight; where upward growth takes place and new buds are formed</p>
<p>Contains an embryo and nutrients to produce new offspring/trees</p>	<p>Transports sugars (food) from the leaves down to the roots and branches; also called inner bark</p>	<p>Exchanges pollen with other trees to fertilize the next generation; enables the tree to produce seeds</p>	<p>Grows to bring leaves above competing trees so they are in contact with sunlight; supports branches</p>
<p>Absorbs water and nutrients from the soil and anchors the tree in the ground to provide support</p>	<p>Found between the phloem and xylem, a “growth layer” of cells that produces a new layer of xylem and phloem each year</p>	<p>Provides support for the tree; actually dead wood at the very center of the tree</p>	



Tree Cards: Ecosystem Functions

(Print two copies on purple paper and cut into 22 individual cards)

<p>Often a source of food for wildlife and humans; may be used for medicinal purposes, dyes, or cosmetics</p>	<p>Provides habitat and food for many insects; when decomposing, releases nutrients back into the soil; may be used for paper products and mulch</p>
<p>Stores carbon dioxide, reducing greenhouse gases; provides material for products such as paper and furniture</p>	<p>Absorbs water from the ecosystem and stores it for use in dry times; produces sap such as maple syrup</p>
<p>Provides shade and evaporates water; absorbs carbon dioxide and releases oxygen; provides food for animals and insects</p>	<p>Provides food in the form of nectar to bees, birds, and other pollinators</p>
<p>Holds soil in place so the tree does not wash away in rain and wind; takes up nutrients in the soil</p>	<p>Enables the tree to grow strong for protection from wind and storms; produces pectin, used in jellies, jams, and candies</p>
<p>Transfers sugars (food) the tree creates from sunlight, water, and carbon dioxide, making this energy available to the ecosystem (including humans!)</p>	<p>Strong wood ideal for building materials; may eventually hollow out from the center of the tree and provide prime animal habitat</p>
<p>Provides shade and evaporates water; absorbs carbon dioxide and releases oxygen; provides food for animals and insects</p>	<p>Provides habitat for animals and insects; organic material for soil; and shelter from wind and rain</p>