

GEORGIA AG EXPERIENCE

A MOBILE CLASSROOM POWERED BY



LESSON TITLE: “Creating a Tree Cookie”

Subject: Agriculture - Forestry	Grade Level: 3rd – 5 th	Estimated Time: 60 minutes
Resources & Materials: • PowerPoint: ○ https://docs.google.com/presentation/d/1bAv7qv0oBzLxgdX62DSUOPRIOIGQ9jvhDA03eYdU4HQ/edit?u sp=sharing • Cookie Supplies ○ medium to large sized sugar cookie (1 per student) ○ plate (1 per student) ○ napkin (1 per student) ○ plastic knife or other types of spreading utensil (1 per student) ○ a Twizzler peeled in skinny strips (1 per student) Every group of students (about 5) will need: • container of dark icing, • container light icing, • small bowl of Oreo crumbs, • bowl of black or dark colored Jimmie sprinkles, • bowl of red (or pink or blue) sanding or coarse sugar sprinkles *Color of material doesn’t matter if you are consist or have a key for the students		
Standards: <u>1st grade ag standards:</u> AFNR-NRS: Develop and build an understanding of the area of forestry, environmental and natural resource systems. a. Identify, map and label deciduous and evergreen trees nearby. <u>2nd grade</u> S2E3. Obtain, evaluate, and communicate information about how weather, plants, animals, and humans cause changes to the environment. a. Ask questions to obtain information about major changes to the environment in your community. b. Construct an explanation of the causes and effects of a change to the environment in your community. <u>2nd grade ag standard:</u>		

AFNR-2AS: Investigate and develop an understanding of agricultural systems such as Agricultural Mechanics; Plant Systems; Animal Systems; and/or Food Systems.

2AS4. Collect, display and explain the parts of a production animal and the importance of each part.

5th grade

S5L3. Obtain, evaluate, and communicate information to compare and contrast the parts of plant and animal cells.

b. Develop a model to identify and label parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus).

Learning Objectives:

1. Students will be able to individually label 100% of the parts of a tree cookie on a given worksheet during classroom instruction.
2. Students will be able to create a model of a tree cookie with 5/6 indicated parts correctly placed during a guided class project.
3. Students will be able to describe the function of the different tree cookie sections during in class discussion with 8/10 questions answers correctly

Guiding Background Knowledge & Fun Facts:

INTEREST APPROACH:

Estimated Time: 3 minutes

Ask the students: What is your favorite cookie to eat?

Say “my favorite is a tree cookie, but this isn’t a cookie that you eat. Today we are going to be looking at what a tree cookie is, the different parts of the inside of a tree, and you’ll even get a chance to make your own tree cookie.”

LEARNING ACTIVITY #1: Defining Sections of a Tree

Estimated Time:

Resources & Materials:

- Tree Cookie Worksheet
- Pencils
- Tree Cookie Power Point

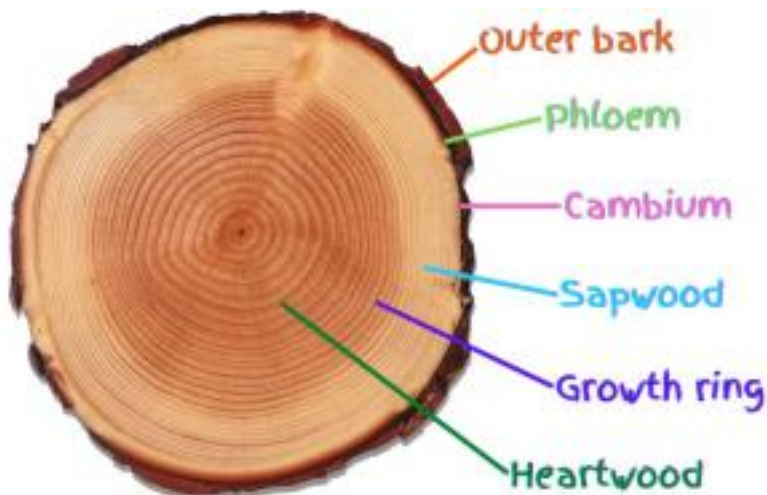
Vocabulary:

- **Tree Cookie** – a cross section of a tree
- **Cross Section** – the interior and bark between the roots and the branches of the tree
- **Outer Bark** – This layer is on the outside of the tree and protects it from insects, disease, excessive heat, and cold, and other injuries that could hurt the tree

- **Phloem** – This layer carries sugar made in the leaves or needles down to the trunk and roots
- **Cambium** – a layer or zone of cells, a single cell thick, and is found inside the inner bark
- **Sapwood** – This layer is living and located between the bark and the heartwood
- **Growth Ring** – The lighter portion is called the “early wood”, and the darker portion the “late wood.” Together, they represent one year of growth.
- **Heartwood** - develops as a tree gets older. Old sapwood no longer carries sap, but provides the trunk with support and stiffness

Instructor Directions:

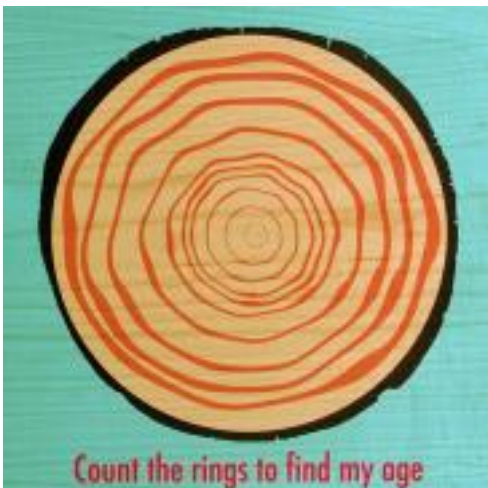
1. Hand out a Tree Cookie Worksheet to each student and instruct them to label it throughout the lesson.
 2. Open the Power Point and start on slide three and move to slide four:
 - a. <https://us.123rf.com/450wm/bezwershenco/bezwershenco1807/bezwershenco180700007/114964033-stock-vector-couple-of-gardeners-farmers-planting-tree-in-the-park-vector-flat-illustration-isolated-on-white-back.jpg?ver=6.2>.
- A tree cookie is the cross section of the tree.
 - The cross section of a tree is the interior and bark between the roots and the branches of the tree.
 - Think about what you would see if you cut the tree parallel, this is the cross section.
 - The tree cookie allows us to see the different parts of the tree that are on the inside.
 - Tree cookies tell us about the environment the tree is growing in and its life.



- a. Outer bark: This layer is on the outside of the tree and protects it from insects, disease, excessive heat, and cold, and other injuries that could hurt the tree.
 - i. The outer bark of the tree is like the skin on our bodies.
 - ii. It helps the tree from losing water when the air is very dry.
3. Move to slides 5 – 10 and point out the different parts of the tree in the picture. Explain what each part does for the tree.
 - a. Ask students: Have you ever felt the bark on a tree? What did it feel like?

- i. The bark on a tree can be dark brown or light brown, smooth or rough, flakey or in plates.
 - ii. The bark of the tree also helps scientists determine the species in the winter when the tree might not have leaves on it.
 - b. Phloem: This layer carries sugar made in the leaves or needles down to the trunk and roots. These sugars are then converted into the food trees need in order to grow.
 - i. Photosynthesis is the process that creates the sugar.
 - c. Cambium: The cambium is a layer or zone of cells, a single cell thick, and is found inside the inner bark. The cambium produces both phloem and xylem cells. The cambium is where diameter growth occurs, and where the rings and inner bark are formed.
 - i. Xylem: Like phloem, xylem moves water and minerals from the roots to the rest of the plant. It also helps provide support.
 - d. Sapwood: This layer is living and located between the bark and the heartwood. The sapwood carries the sap backup from the roots to the leaves. Sapwood gives a tree its strength.
 - i. Sap: consists of water, nitrogen, and mineral nutrients
 - e. Growth Rings (Tree rings): The lighter portion is called the “early wood”, and the darker portion the “late wood.” Together, they represent one year of growth. In order to see how old a tree is, you can count the number of rings.
 - i. Early wood: grown in the spring
 - i. Late wood: grown in the summer
 - f. Heartwood: Heartwood develops as a tree gets older. Old sapwood no longer carries sap, but provides the trunk with support and stiffness. In many species (types) of trees, heartwood is a darker color than sapwood, since its water-carrying tubes get clogged up.
4. Move to slide 11 and have students count the number of rings on the picture to practice
5. Move to slide 12 and review the careers. Ask: Who remembers what the tree rings tell us about the tree?
- a. ANSWER: the age of the tree, growing conditions, weather, climate.

Ask the students how old this tree is:



ANSWER: There are 11 rings so the tree is 11 years old

- Foresters are people that use information from a tree cookie to make decisions about how to manage the forest or woods
- A Dendrochronologist is someone who reads the rings on the tree to find out more information about the tree.

Content/Procedure: Engage, Explore, Test and Improve

Engage:

Explore:

Test & Improve:

LEARNING ACTIVITY #2: Cookie Crafting

Estimated Time: 20 minutes

Resources & Materials:

Cookie Supplies

- medium to large sized sugar cookie (1 per student)
- plate (1 per student)
- napkin (1 per student)
- plastic knife or other types of spreading utensil (1 per student)
- a Twizzler peeled in skinny strips (1 per student)

Every group of students (about 5) will need:

- container of dark icing,
- container light icing,
- small bowl of Oreo crumbs,
- bowl of black or dark colored Jimmie sprinkles,
- bowl of red (or pink or blue) sanding or coarse sugar sprinkles

Vocabulary:

- Tree Cookie – a cross section of a tree
- Cross section – the interior and bark between the roots and the branches of the tree
- Heartwood - develops as a tree gets older and provides the trunk with support and stiffness
- Sapwood - living and carries the sap from the roots to the leaves. Sapwood gives a tree its strength
- Bark - protects it from insects, disease, excessive heat, and cold and other injuries that could hurt the tree

- Cambium - produces phloem and xylem cells, is where diameter growth occurs, and where the rings and inner bark are formed
- Phloem - Carries sugar made in the leaves or needles down to the trunk and roots
- Growth Rings - the lighter portion is called the 'early wood' and the darker portion the 'late wood'. Together, they represent one year of growth.

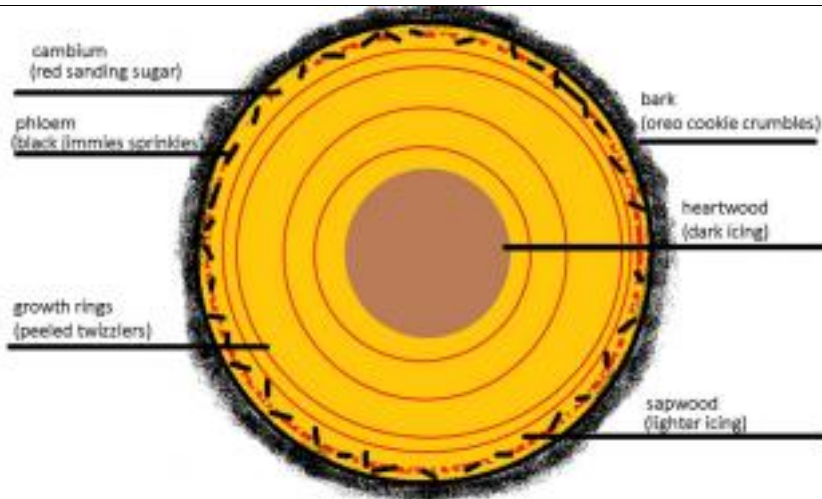
Instructor Directions:

Instruct students that we will now begin an activity to make our own tree cookies out of cookies!

REMIND STUDENTS (before or during the process of making the tree cookies) They will get to eat their cookies at the end of the lesson, but not before they get checked off.

Depending on your students and their age:

- Walk students through step by step and do the activity together
 - OR give them the instructions at the beginning of the learning activity and have them complete this on their own
1. Get the cookie – this represents a section of a tree (a tree cookie)
 2. Dark icing (in the middle as a circle) – This is the heartwood.
 - a. Heartwood develops as a tree gets older. It provides the trunk with support and stiffness
 3. White icing (rest of the cookie) – This represents the sapwood
 - a. The sapwood is living and carries the sap from the roots to the leaves. Sapwood gives a tree its strength
 4. Oreo crumbs around the edge/side of the cookie – This is the bark
 - a. Bark protects it from insects, disease, excessive heat and cold and other injuries that could hurt the tree
 - b. NOTE: Students may put icing around the edge to get Oreos to stick
 5. Ring of Red sanding sugar sprinkles just under a half an inch from edge – Cambium
 - a. The cambium produces phloem and xylem cells, is where diameter growth occurs, and where the rings and inner bark are formed.
 6. Black sprinkles on top of the red or in between in a circle around the cookie – Phloem
 - a. Carries sugar made in the leaves or needles down to the trunk and roots. These sugars are then converted into the food trees need in order to grow.
 7. Peele twizzlers in circles in the remaining space between where the dark icing begins and the red sprinkles end – Growth Rings
 - a. The lighter portion is called the 'early wood' and the darker portion the 'late wood'. Together, they represent one year of growth.



For older or more advanced students:

Now that students have made their tree cookies, challenge them to figure out a way to display some of the following characteristics (below) that can be seen on a tree cookie. You can do this by adding different colors of icing or other candies.

Review the extra material

- Before you begin decorating cookies if you want to change them to start with or if they are grasping the material really fast or after decoration occurs. The challenge with this is stopping students from eating the cookies while you introduce new material, but may work better because you are breaking up the presentation of material

1. Fire scar: When a tree is damaged by a hot fire a scar is seen on the tree cookie. The fire was not hot enough to kill the tree, but it left behind a burnt line or section on the tree cookie.
 - a. A fire scar only occurs on one year of growth



- b. _____
2. Dead or broken branch: A scar that extends across multiple years of growth. The tree is trying to repair the rings here.



3. Drought: The tree rings will become narrow in the time of drought because the tree is not growing as much
4. Small space to grow because of overcrowding of trees: Tree rings will become narrow because the tree is not growing as much
5. Bug or insect: when a tree becomes infested with bugs, they make little tunnels inside of the tree and these can be seen on the tree cookie
 - a. The above image is bark beetle damage

Content/Procedure: Engage, Explore, Test and Improve

Engage: Students build a tree cookie from edible ingredients and learn about each part of a tree.

Explore: Students can learn what each part of the tree is responsible for and how it grows through each step in the Tree Cookie making process.

Test and Improve: Students can go beyond basic knowledge of parts of a tree and learn what environmental effects can have on trees

SUMMARY:

Estimated Time: 10 minutes

Class Discussion:

While students are enjoying eating their tree cookies, the following questions for a review:

1. What is a tree cookie?
 - a. Possible Answers: cross section of the tree, inside of the tree you can see when the tree is cut, inside of the tree from the branches to the roots
2. Where is the outer bark on the tree? Where was it on your cookie?

- a. Answer: The outside of the tree
- b. Answer: On the cookie, the outer bark was the oreo crumbs covering the outside edges of the cookie
- 3. What does the outer bark do for the tree?
 - a. protects it from insects, disease, excessive heat and cold, and other injuries that could hurt the tree.
- 4. Where is the phloem on a tree? Where was it on your cookie?
 - a. Answer: Phloem is between the bark and cambium.
 - b. Answer: On the cookie, the phloem was the dark sprinkles.
- 5. What does phloem do for the tree?
 - a. Answer: Carries sugar made in the leaves or needles down to the trunk and roots. These sugars are then converted into the food trees need in order to grow.
- 6. Where is the cambium on a tree? Where was it on your cookie?
 - a. Answer: Cambium is a layer or zone of cells, a single cell thick, and is found inside the inner bark.
 - b. Answer: The red sprinkles on the cookie was the cambium
- 7. What does the cambium do for the tree?
 - a. Answer: The cambium produces phloem and xylem cells, is where diameter growth occurs, and where the rings and inner bark are formed.
- 8. Where is sapwood on a tree? Where was it on your cookie?
 - a. Answer: This layer is living and located between the bark and the heartwood.
 - b. Answer: The sapwood is the light colored icing on the cookie
- 9. What does the sapwood do for a tree?
 - a. Answer: The sapwood is living and carries the sap from the roots to the leaves. Sapwood gives a tree its strength.
- 10. Where are the tree rings on a tree? Where was it on your cookie?
 - a. Answer: Tree rings are shown all throughout the tree.
 - b. Answer: The tree rings were the twizzlers on the cookie.
- 11. What do tree rings tell us?
 - a. Answer: Tree rings tell us how old the tree is and information about the living conditions of the tree.
- 12. Where is the heartwood of the tree? Where was it on your cookie?
 - a. Answer: Heartwood is in the middle of the tree.
 - b. Answer: The dark icing was the heartwood on the cookie.
- 13. What does the heartwood do for the tree?
 - a. Answer: Heartwood develops as a tree gets older. It provides the trunk with support and stiffness.

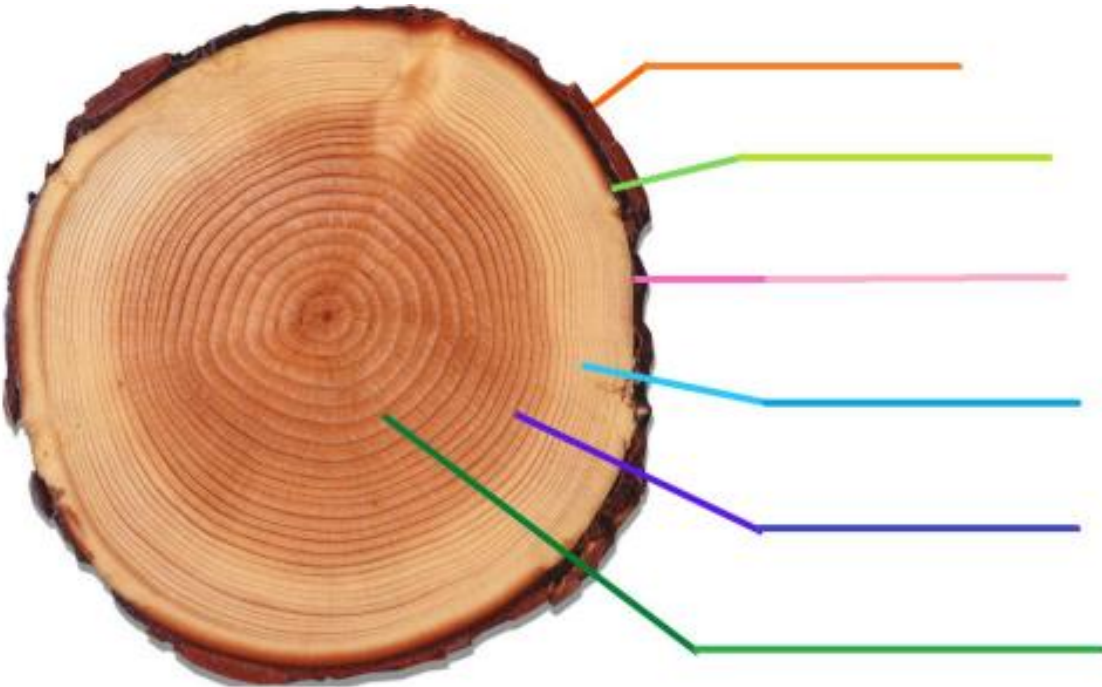
EVALUATION:

Estimated Time: 10 minutes

Formative: Questions asked throughout the lesson and tree cookie completion	
Summative: Questions asked during the reflection that can also be applied to a test or quiz.	

Parts of a Tree Cookie Worksheet

Label the parts as the teacher is teaching



Write down the part of the tree cookie that goes with each piece of candy

Dark icing:

Light icing:

Red sugar sprinkles:

Dark sprinkles:

Oreos:

Twizzlers: