INNOVATION WYRKSHOP

TREE RING'S

ESTIMATED TIME: 2.5 HOURS

LEARNING OBJECTIVES

- Learn the anatomy of a tree.
- Create your own model.
- Teach the class what you have learned.

LEVEL: 1–3

STANDARDS

- NGSS
  - MS-LS1-5
- PBL
  - A Challenging Problem or Question
  - Sustained Inquiry
  - Authenticity
  - Student Voice and Choice
  - Reflection
- STEM
  - Life Science
    - Sustained life requires sustainable energy and matter inputs
    - Ecosystems are dynamic in nature
- ISTE
  - Empowered Learner 1.1a, 1.1c
  - Innovative Designer 1.4.a, 1.4.c

MATERIALS NEEDED:

Laptop with CAD software (optional)

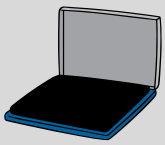

Markers

Glue


Tape


Calculator


Card Stock


Black Stamp Ink


Wood Cross Section

ACTIVITY OUTLINE:

Students reconstruct a tree based on what they learn from a tree cross section. They must formulate their own ideas about what it looked like, how tall it was and how old it was.

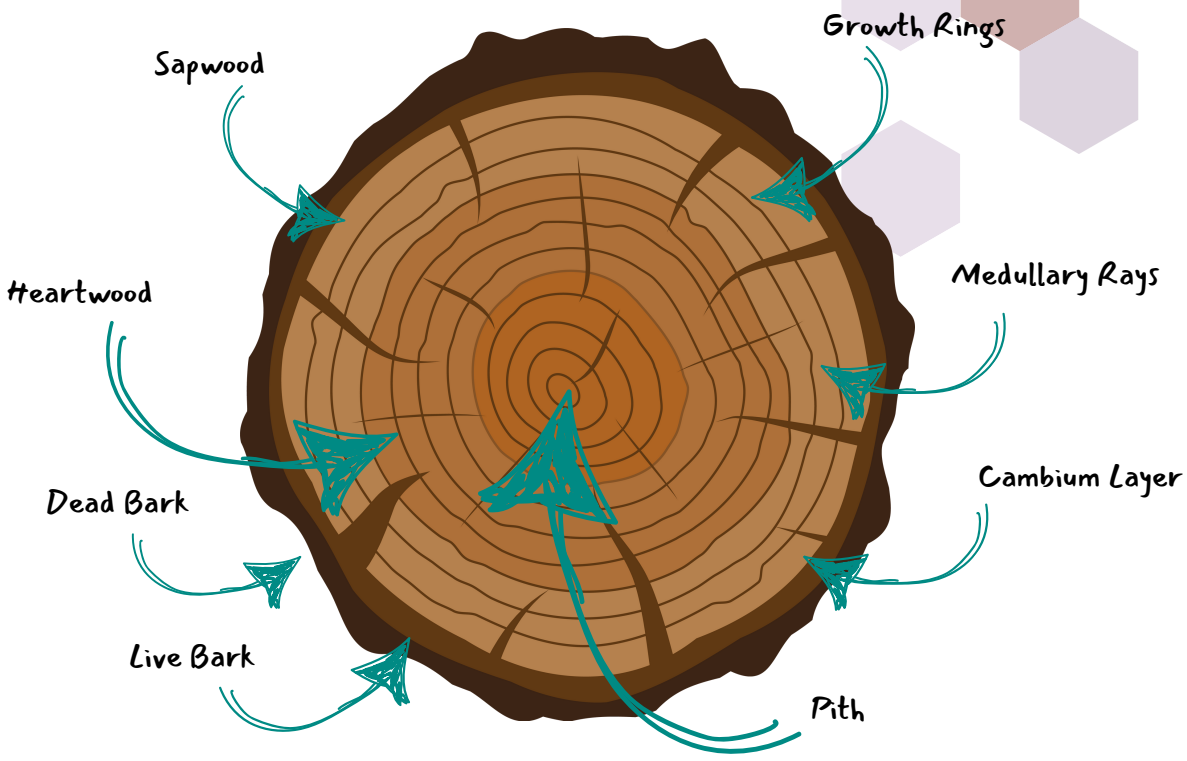
Advanced: Students will work to reconstruct the tree with precise dimensions relative to an object using a CAD software.

INTRODUCTION:

Tree's come in all different kinds of shapes and sizes. But did you know that even a dead tree can tell you about its history? A tree cross section can tell you what age the plant was when it died, but it can also teach you the weather patterns of the local area.

In today's lesson, we will each get a cross section of a tree and information on what species it was, when it was cut down, and where it grew. From there, you will need to calculate how old the tree was. Then do a bit of research to find out how big that species usually gets and recreate the tree! You can use paper, glue and tape or for more advanced learners, you can use a CAD software.

ANATOMY:



Sapwood: This is like the tree's drinking straw. It's the part of the tree that carries water and nutrients from the roots to the rest of the tree. It's usually lighter in color than the heartwood.

Heartwood: Imagine this as the tree's strong backbone. It's the inner part of the tree and gives the tree its strength and support. It's darker in color compared to the sapwood.

Dead bark: This is like the tree's old, crusty skin. It's the outer layer of the tree's trunk and branches, and it protects the tree from things like bugs and weather.

Live bark: This is the outer layer of the bark that's still alive and growing. It helps protect the tree, and it's where the tree grows wider.

Pith: Think of this as the tree's core. It's a soft, spongy material at the very center of the tree. When the tree is young, it helps it grow, but as the tree gets older, it doesn't do much.

Cambium layer: This is like the tree's growth factory. It's a thin layer of cells between the sapwood and the bark. It's where the tree grows wider and adds new layers of wood.

Medullary rays: These are like the tree's little highways. They're tiny structures that go from the center of the tree all the way to the bark. They help transport food and water sideways through the tree.

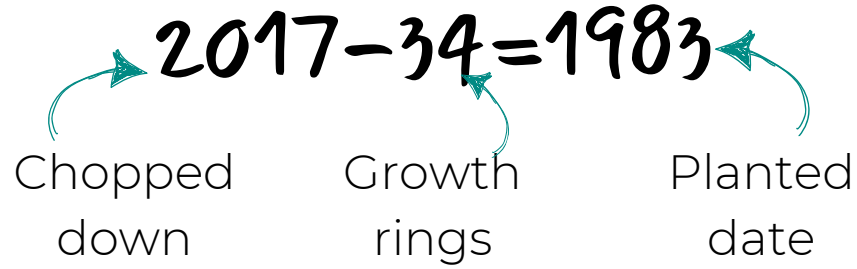
Growth rings: Imagine these as the tree's age rings, just like how you can count the rings on a tree stump to see how old it is. Each year, the tree adds a new layer of wood. If the year was dryer than normal, the space between the rings will be thinner.

STEP 1:

Let's calculate the age of the tree! First, look at your cross section. Start by counting the growth rings starting in the middle working out. When you get done counting, write down your number.

STEP 2:

Ready for some math? Don't worry, its pretty easy. Take the year the tree was cut down and subtract the number of growth rings. This will tell you when the tree was planted.



STEP 3:

Great job! Now, let's do a little research on our tree.

Your Species:

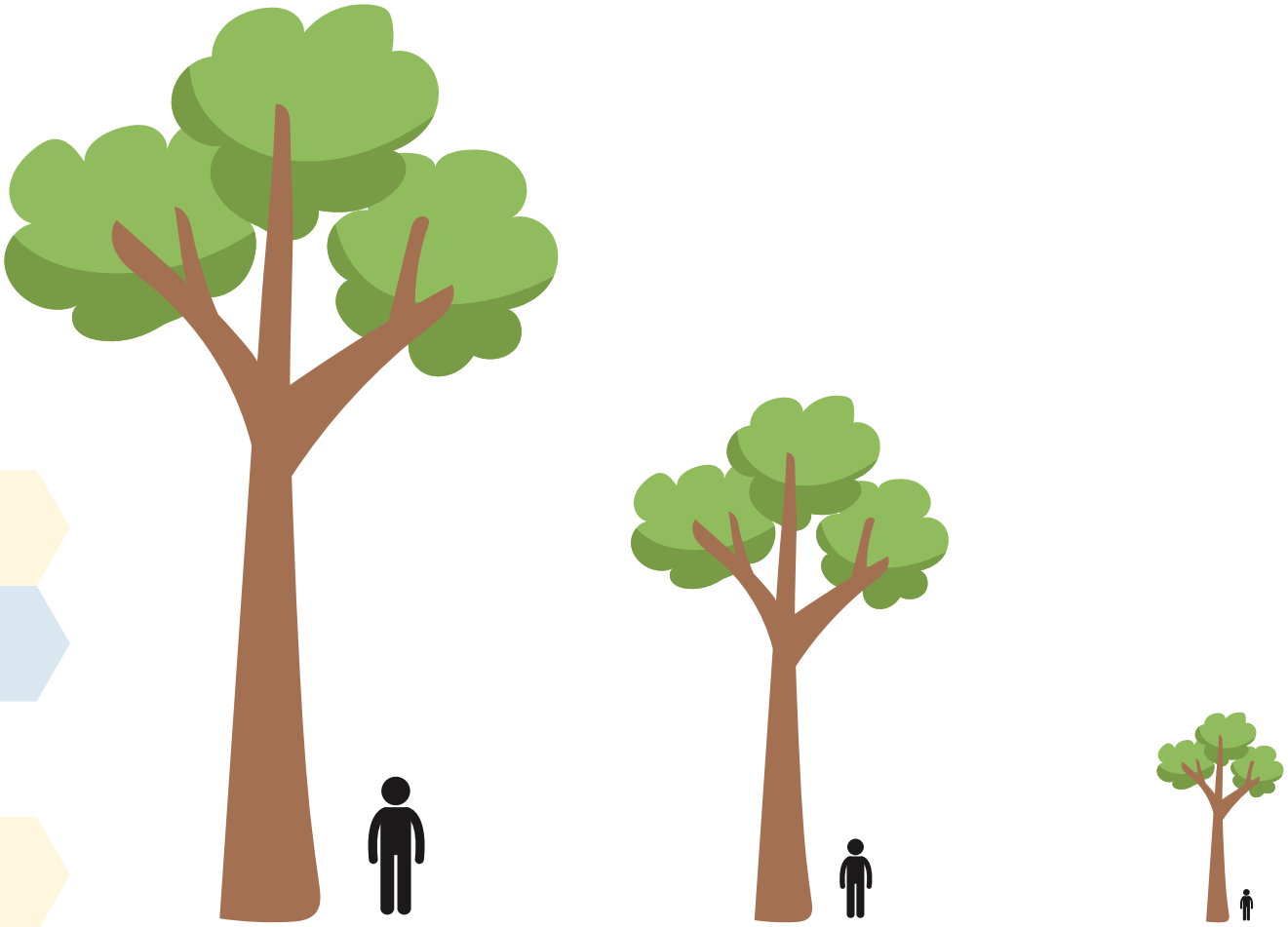
Average Height:

Average Growth per Year:

STEP 4:

Now that you have all of the necessary information, let's recreate our tree. Now we aren't going to recreate a 60 foot tall tree out of paper, glue and tape. But we can create a scaled model of the tree.

To do this, choose an object with a known height and compare its size to the tree's size. So if you had a 6 foot tall human and a 60 foot tall tree, the human would be 1/10th of the tree's height. With that in mind, decide how big your tree model is going to be. If I wanted a 6 inch model of the tree, I need to scale my tree by 120 times and my human by 1,200 times.



BONUS:

What else can you tell from your tree cross section? Are there any knots in the wood, or scarring?

Based on the cross section, where there years of drought or abundance? Cross reference this with historical weather records.

Create your tree using a CAD software using the same sizing and scaling methods in the previous step.