

Materials Needed

- Nearby trees listed in this Learning Activity Sheet
- Measuring tape (cloth) or string
- Pen or pencil
- Writing paper or STEAM journal
- Smartphone, tablet or computer with calculator (Internet access optional)

Grade Range

6-8

Topics/Skills

Math: Measurement; Estimation; Circumference;
Science: Life Science;
Engineering

Learning Standards

CCSS: [Geometry](#)
NGSS: [Engineering](#)
NGSS: [Life Science](#)

Duration

30 – 45 minutes

Prep Time

10 minutes

Tree, How Old Are You?

Estimate How Old Trees Are

We track our age by keeping track of our birthday every year. How can we find out how old a tree is? When a tree is cut down scientists count its annual growth rings to estimate its age. But what if the tree is still alive? Can we go up to a tree and ask it how old it is? No! Should we cut it down to find out? Not unless we need to remove the tree for other reasons! In this activity, you will learn how to estimate a tree's age without harming it.

Activity Challenge

Determine the approximate age of common trees in the neighborhood.

Preparation

Review the Materials List and gather the necessary items.

To Do - Refer to the table on the next page to complete the Learning Activity.

1. Locate as many of the 4 different types of trees in the table that you can find close to where you live or in nearby parks, playlots, or trails. You can identify the type of tree by the shape of its leaves and the appearance of the seed pods and seeds. Seeds typically form in the summer, but before summer you might find seeds that are left over from the previous year.
2. Measure the circumference of each tree, in inches, about 4 ½ feet above the ground. To do this wrap a measuring tape or string all the way around the trunk.
3. To calculate the tree's approximate diameter, divide the circumference by approximately 3.1, which is approximately equal to Pi (π).
4. Multiply the diameter by the Growth Factor (GF) shown in the table to find the approximate age of the tree. The GF can also be found online in this [table of tree growth factors by species](#).

Observations

The tree's environment affects the speed that it grows, its overall shape, the number of seeds that it creates, and its overall health. Write about the environmental growing conditions of each tree in your STEAM journal. Note the amount of sun, shade, water, space, and pollution in each tree's environment.





Extensions

- Take note of any potential risks to each tree's life.
- What things could the owner of the tree do to make the environmental growing conditions better for their tree?
- What can society do to make growing conditions better for all trees?
- Approximately what year were each of the trees planted? What major events happened in those years?
- Write a historical fiction story about the life of one or more of the trees.

The Science Behind the Activity

Different types of trees grow at different rates. Foresters have published tables of [Growth Factors \(GF\)](#) for many types of trees, which can be used to estimate a tree’s age. Growth Factors are based on average conditions across many different trees. An individual tree can grow faster or slower than the average based on the tree’s growing conditions.

Each year a tree grows new layers of wood to form annual rings just under a tree’s bark. Each ring has a light and a dark portion. The light portion is fast spring growth, and the dark portion is slower late summer growth. The bark grows along with the tree. A tree’s exact age is equal to the number of rings, which can only be counted after the tree is cut.

Tree Type	Growth Factor	Circumference of Tree	Diameter	Approximate Age of Tree
<p>American Beech</p> 	6.0	25 inches	$25 \text{ inches} \div 3.1 = 8 \text{ inches}$	$8 \text{ inches} \times 6.0 = 48 \text{ years old}$
<p>Cottonwood</p> 	2.0			
<p>Black Walnut</p> 	4.5			
<p>River Birch Species</p> 	3.5			