

DENDROCHRONOLOGY



TREE RINGS



Pennsylvania has many different trees – oak trees, maple trees, pine trees, even hemlock trees. Each of these trees contains the history of what the world was like around the tree as it grew. The rings inside the tree's trunk tell the story of its annual growth and reflect changes to the seasonal climate. Climate is the average weather conditions in a place over a long period of time (30 years or more). Tree rings are important data banks. Since trees often live for hundreds of years, the tree rings contain a long record of environmental conditions before measurements were recorded.

Dendrochronology is the dating and study of annual rings in trees.

ology
chronos
dendros

the study of
time; more specifically, events and processes in the past
using trees; more specifically, the growth rings of trees

Scientists don't have to cut down a tree to gather information from the rings. A sample can be collected with an instrument called an increment borer. The increment borer extracts a thin strip of wood that goes all the way to the center of the tree. When a strip is pulled out, the rings on the strip of wood can be counted and the tree stays healthy.

Conifer Tree Ring

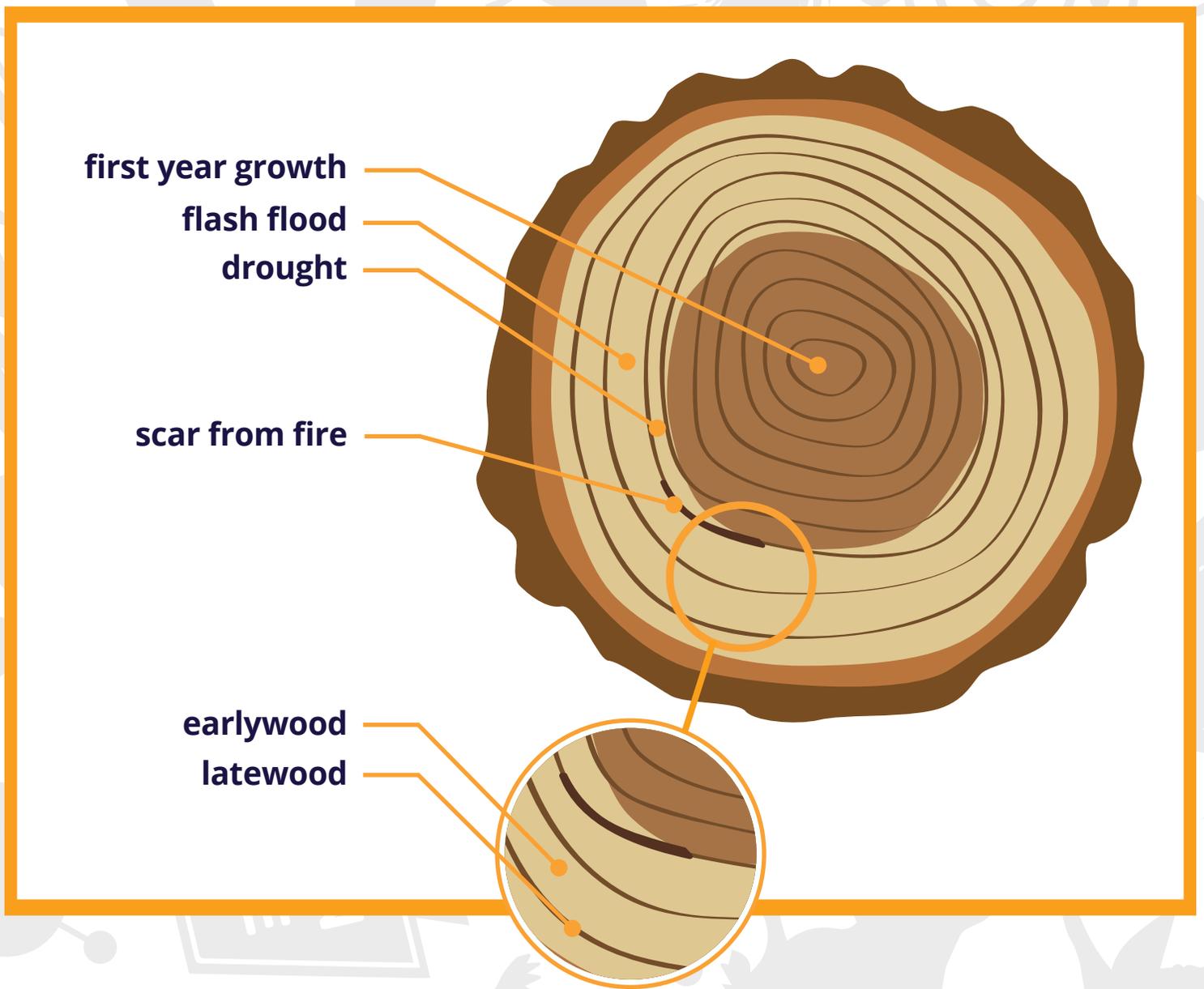
At the beginning of each growing season, in early spring, a layer of thin-walled cells called earlywood grows between the older wood and outer bark. In a conifer tree cross-section, the earlywood appears light in color.

As the growth slows toward the end of the summer, smaller, thicker-walled cells known as latewood are produced. In a conifer tree cross-section, the latewood appears dark in color.



Combined with other cells formed during the normal growing season, the earlywood and the latewood compose one annual ring representing one year of growth. Tree growth is sensitive to fluctuations in atmospheric conditions, such as moisture, temperature, and sunlight. Broad or wider rings usually reflect a warm, wet year, while narrow or thinner rings reflect colder temperatures or other environmental stress. Some factors, such as drought, may cause little annual growth.

Crossdating is an essential part of dendrochronology. It is the process of matching patterns of growth variation through time across many trees. This technique ensures that each individual tree ring is assigned its exact year of formation. This is accomplished by matching wide and narrow ring patterns across trees to temporally align the common pattern of variation. By crossdating ring growth between trees, dendrochronologists can assign a calendar year to match the ring formation.



Rings of Your Life

Make rings to reflect your life. Add a ring for every year of your life. What do your rings tell about your life? Did you grow quickly? Did you have an illness? Reflect the changes in your life as you grew in the rings that you draw.

