



Reading Trees

Understanding Dendrochronology

Subject: History, Virginia Studies, Science, Math/4th –6th grades

Colonization and Conflict: 1607 through the American Revolution

- VS.3 The student will demonstrate knowledge of the first permanent English settlement in America by
- a) explaining the reasons for English colonization;
 - b) describing how geography influenced the decision to settle at Jamestown;
 - f) describing the hardships faced by settlers at Jamestown and the changes that took place to ensure survival;
 - g) describing the interactions between the English settlers and the Powhatan people, including the contributions of the Powhatans to the survival of the settlers.

Scientific Investigation, Reasoning, and Logic

- 5.1 The student will plan and conduct investigations in which
- e) data are collected, recorded, and reported using the appropriate graphical representation (graphs, charts, diagrams);
 - f) predictions are made using patterns, and simple graphical data are extrapolated;
 - g) manipulated and responding variables are identified; and
 - h) an understanding of the nature of science is developed and reinforced.

Number and Number Sense

- 6.4 The student will compare and order whole numbers, fractions, and decimals, using concrete materials, drawings or pictures, and mathematical symbols.
- 6.5 The student will identify, represent, order, and compare integers.
- 6.7 The student will use estimation strategies to solve multistep practical problems involving whole numbers, decimals, and fractions (rational numbers).

Measurement

- 6.9 The student will compare and convert units of measure for length, area, weight/mass, and volume within the U.S. Customary system and the metric system and estimate conversions between units in each system:
- a) length — part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;

Background: Research at Jamestown Island has shown that the early settlers at Jamestown struggled with environmental challenges beyond their control. The study of the tree rings have shown that the settlers and the native population struggled to survive during one of the worst droughts in history. Archaeologist Dennis Blanton of the College of William and Mary has shared his research on tree rings with the archaeologists at Jamestown Rediscovery. His research shows that the limited fresh water resources caused great hardship for the people of

Jamestown. Many of the settlers died from starvation and disease which were caused by a lack of useable water.

Students may want to discuss the other stresses a lack of water could have caused. How might this affect the relationships and trade systems between the Powhatans and the English?

Dendrochronology Better known as “tree-ring dating.” Climate changes create different patterns in tree rings, which grow at a rate of one ring per year. Patterns can give scientists information about the date for when a tree was cut down.

Materials:

Yellow construction paper, at least 2 12" squares per student

Brown crayons

Compasses

Scissors

Rain fall spinner

Divide your class up into groups of five or six students each.

Start by having the students draw a circle in the center of the construction paper. Make each student draw a circle that is 1", 2", 3" or 4" in diameter. Let them each choose which diameter they start with so there is variety. Color the very edge of the circle, using the brown crayon. Make it a very thin band of color. This will represent the division between the tree rings.

Have **team one** spin the rain fall spinner. Using the same center of your circle, have all students add the amount indicated to your circle diameter. Color a very thin band of brown on the very edge of the new circle. (spin again if you get “CUT YOUR TREE” on the first spin

Repeat. Have **team two** spin the rainfall spinner. Using the same center of your circle, have all students add the amount indicated to your circle diameter. Color a very thin band of brown on the very edge of the new circle. (If a team spins “CUT YOUR TREE,” that team has to stop adding to their tree rings. Have that team start a new sequence with a new piece of paper. Pass the spinner to the next team.)

Keep this up until all the teams have had to CUT THEIR TREE, or until there is a reasonable representation of tree ring samples. Ask the students to discuss the patterns they see in their tree rings. Have them remember that the thinner rings are drought years and the thicker rings are from years with higher rainfall.

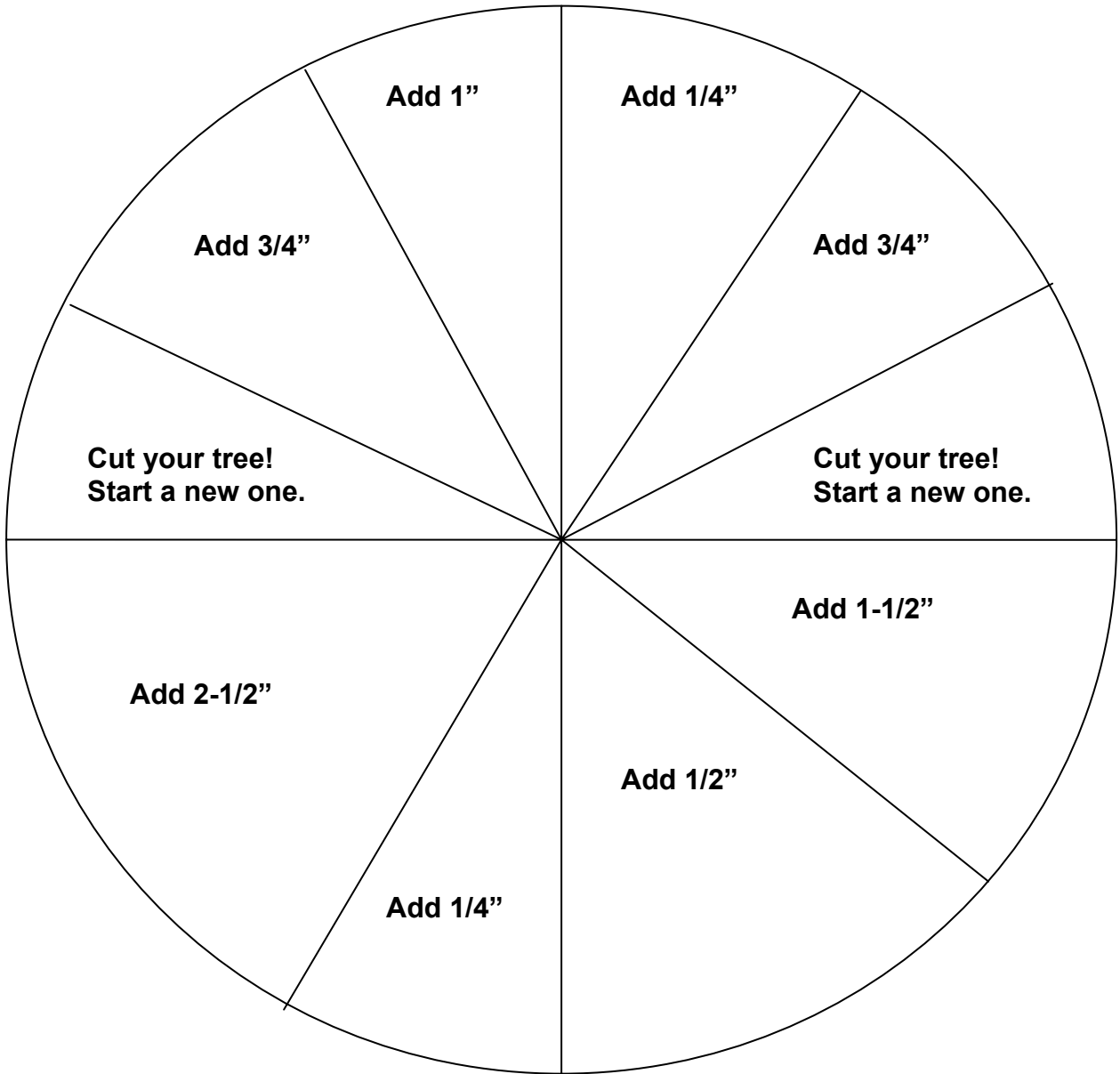
Have each student cut a 1 inch wide sample through the center of the tree rings. Collect all the ring samples, mixing them up. Randomly but evenly redistribute the strips to the teams. Have each team work together to arrange the ring samples in chronological order based on the patterns of the tree rings. The trees cut first will end up in the early part of the sequence. The trees started mid process or cut mid process will end up in the middle of the sequence, and the trees that were cut last or started near the end will end up at the end of that sequence. Have each team describe the history of the tree

sequence they have. Note the periods of drought and rainfall. Also note if there are any gaps in the sequence.

Additional projects: create graphs for rainfall based on 1" ring = 10" rain.

RAIN FALL SPINNER

Copy on heavy stock



Cut the arrow to size and attach as a spinner to the circle.

