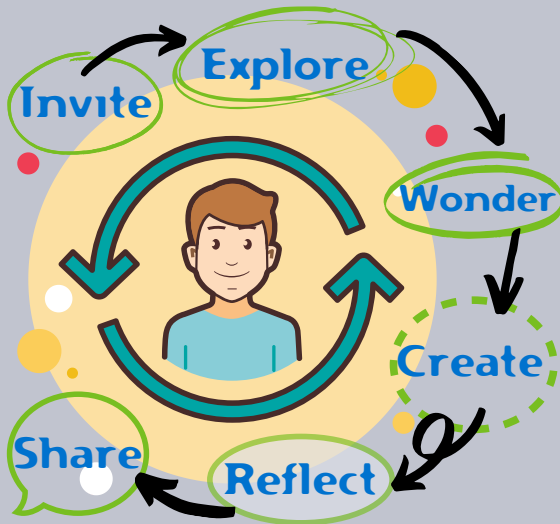




Tree-Hugger: Practicing Mean, Median, and Mode



Exploration, combined with wonder, creativity, and reflection, inspires meaningful learning. This six-step model can be used to inspire learning of the most significance- forming a vital connection between content and world.

To begin this lesson, ask your students initiating questions, like, *Have you ever hugged a tree? Were you able to fit your arms all the way around it? What did it look like? What did it feel like?* Eventually, work your way to the leading question, *How big around do you think it was?* Then, explain to the students that today, they'll be able to hug some trees and figure out how big around they are (feel free to use the word "circumference" if age appropriate). Before measuring the actual trees, take some time to allow the students to measure their own arm-span (besides being fun, this will actually begin to engage them in the activity). Then, review the concepts of mean, median, and mode, and have the students determine the mean, median, and mode arm-span of the class (or family). Finally, it's time to formally invite your students on an adventure to measure the circumference of trees.

INVITE:

Explore the schoolyard, backyard, or park with your students. Allow them to pick the trees that they want to study. With each tree, prompt the students to make a variety of observations. Use guiding questions like, *What do you notice about it? What do you think about it? Does it remind you of anything? What do you wonder about it?* Eventually, demonstrate to the students how to measure the tree by wrapping a string around the trunk, and then measuring the length of the string used with a tape measure, yardstick, or ruler.

EXPLORE:

WONDER:

Based on the students' responses to your guiding questions, prompt them to record their observations about the trees in a journal, notebook, or loose paper. These observations can be just about anything, like relative size, leaf-shape, bark texture, something the tree might remind them of, or anything they think or feel about the tree. Older students might be prompted to identify the tree using a guide book or dichotomous key. Always feel free to ask more guiding questions. Among every other observation, be sure the students record the circumference of each tree.

CREATE:

In a journal or notebook, create a page for each tree that the students observed. On each page, have them describe anything they noticed about the tree. Encourage the students to make this neat and orderly, so that they might share it with friends or family. Additionally, have the students create a table where they record each tree's circumference.

REFLECT:

Prompt the students to reflect on all of the trees that they explored. *Which was their favorite? Why? What did they like about particular trees? Which tree was the tallest? etc.* Finally, ask the leading questions, *Which tree was the biggest around? Which was the narrowest?* With that, invite the students to calculate the mean, median, and mode circumference of the trees that they measured, using the table that they created. Ask some reflective questions, like, *Why are some trees wide versus thin? Are the tallest trees also the widest trees? Which tree was the closest to average circumference? Which was the furthest from average circumference? In this case, are the mean and median similar numbers? Why might we be more interested in using either the mean, the median, or the mode? etc.*

SHARE:

Give your students time to share their journals with other students or family members. Encourage them to ask questions of each-other, and share their favorite information. Guide them to continue thinking about why this information might be important, how professional foresters might measure trees, and what similar types of measurements they might do in their own futures. Encourage them to share these thoughts with others.

Potential standards (Common Core curriculum)

Mathematics

6.SP.B.5.c – Give quantitative measures of center (median and/or mean) and variability (range) as well as describing any overall pattern with reference to the context in which the data were gathered.

7.SP.D.8.a – Give quantitative measures of center (median and/or mean) and variability (range and/or interquartile range), as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

A1.S.ID.A.2 – Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

G.GMD.A.1 – Give an informal argument for the formulas for the circumference of a circle and the volume and surface area of a cylinder, cone, prism, and pyramid.

B.G.C.A.1 – Apply a variety of strategies to determine the area and circumference of circles after identifying necessary information.

English Language Arts

SL.PKI.4 – Present information, findings, and supporting evidence such that listeners can follow the line of reasoning; the organization, development, and style are appropriate to task, purpose, and audience.

SL.CC.2 – Integrate and evaluate information presented in diverse media formats, such as visual, quantitative, and oral formats.

Science

BIO2.LS413 – Interpret data supporting current plant classification schemes. Use a dichotomous key to identify plants based on variations in characteristics.

