Lesson Plan

The Best Time to Plant a Tree

This lesson can be done either with tree core printouts, or with actual tree cores.

Learning Goals

By the end of this lesson, students can:

1. Collect, present, and use data to tell the story of a tree
2. Look at growth patterns, including linear and non-linear patterns.
3. Use this information to predict the future and consider the importance of long-term planning.

Materials

- Assignment Package
- 'What is a Tree Core' Sheet
- Printed or physical tree cores
- Rulers
- Poster materials (coloured pencils, markers, etc.)

Minds-On (8 mins)

Place students at desks in small groups (2-4), each with a different tree core and What is A Tree Core sheet. Ask students how they might determine how old the tree sitting in front of them was when it was sampled. Let students discuss. Some may already know to count rings. Others might not. Let them think about it, and use technology, or other groups if they want to. After a few minutes of open discussion, provide groups with necessary hints. By the end of the discussion, all groups should understand the idea of counting rings.

Introduction (8 mins)

Hand out the data sheet.

Explain that today we will be looking at some of the ways we can use math to learn about trees. Introduce the math focus questions. Tell students that these are the questions we're going to try to answer — maybe not with exact answers, but in general. Give them 5 minutes to review the activity and try to understand how/when we're going to answer each of these focus questions.

Explain, briefly, that they'll start by collecting data from their tree cores. Then they'll graph their data and look at the growth pattern. They'll predict how big a tree seedling would be after 175 years. And finally, they'll present their work as an infographic/poster.

Review classroom norms for groupwork, asking questions, problem-solving, etc.

Class work (2-3 hrs)

Let students work through the sheets. As they finish one, get them to check their work with you. Check in frequently with the groups, providing hints and extensions when necessary. Consider splitting this work over a few days.

Consolidation (10 mins)

Have students place infographics around the room. Give students ten minutes to read the other group's work. Ask them a final prompt question as an exit card: if you were to plant a tree, which species would you choose, and why?

Possible Learning Outcomes (Grade 7-Can be easily modified for other grades)

D1.2 collect continuous data to answer questions of interest involving two variables, and organize the data sets as appropriate in a table of values

Students will compare the variable 'year' to both 'tree width' and 'trunk area.'

D1.4 create an infographic about a data set, representing the data in appropriate ways, including in tables and scatter plots, and incorporating any other relevant information that helps to tell a story about the data

Students will present their data using scatter plots, and incorporate other information.

E1.3 use scale drawings to calculate actual lengths and areas, and reproduce scale drawings at different ratios

Infographic includes scale drawings of the tree species in question.

C1.1 identify and compare a variety of repeating, growing, and shrinking patterns, including patterns found in real-life contexts, and compare linear growing and shrinking patterns on the basis of their constant rates and initial values

Students will examine and compare the growth pattern of different tree species.

C1.2 create and translate repeating, growing, and shrinking patterns involving rational numbers using various representations, including algebraic expressions and equations for linear growing and shrinking patterns

Students will look at the algebraic expression for linear growth.

C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in growing and shrinking patterns involving rational numbers, and use algebraic representations of the pattern rules to solve for unknown values in linear growing and shrinking patterns

Students will look at linear growth in order to predict the width of a planted tree after 7-generations (175 years).

Resources:

http://www.7generations.ca/about/seven-generations/

https://ojibwe.lib.umn.edu/

https://www.youtube.com/watch?v=G71ISbIRCAc