

ACTIVITY 6

TIMBER-R-R THIEVES

In Chapter 6 of *Wisconsin Forest Tales*, students read about thieves stealing four trees growing on the property of Paul’s family. In this activity, students calculate what those trees may have been worth to gain a better understanding of their value.

BACKGROUND

Black walnut trees hold value in both their nuts and their wood. The nuts are commonly used in baking, ice cream, and candy making. The rich, dark color of walnut wood makes it a choice material in furniture, musical instruments, cabinets, boats, and many other beautiful wood products. Other highly valued types of wood in Wisconsin include oak and maple, but typically black walnut wins the prize of most highly valued. Even other countries seek black walnut as a material for their wood products. The United States commonly exports black walnut to countries such as Germany, South Korea, and Japan. Although

some black walnut trees are grown in plantations, most black walnut trees in Wisconsin occur naturally in the southern part of the state. The older the tree, the more valuable the wood will likely be. Veneer quality wood goes for the highest price. (Veneer is a thin sheet of wood peeled from a log. It is applied to the surface of many products such as furniture.) To be veneer quality, the wood must be straight and virtually flawless. Typically the butt log, or log that came from the bottom of the tree, is worth the most money and has the greatest potential to be veneer quality. Logs not good enough to be used for veneer are usually used as saw logs (logs that are milled into lumber).



LESSON OBJECTIVES

Upon completion of this activity, students will be able to:

- Determine the monetary value of a tree.
- Determine the number of products that can be made from a particular volume of wood.

TIME

Introduction.....5 minutes
Activity.....30 minutes
Conclusion.....5 minutes

MATERIALS

- Chalk/Marker board
- Tape measure
- One worksheet per student
- One calculator per student

SUBJECT AREAS ADDRESSED

Mathematics

INTRODUCTION

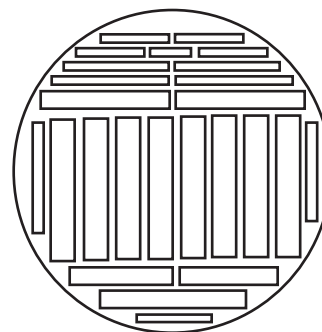
Remind your students that the trees stolen in “Timber-r-r Thieves” are the same four trees at the bottom of the bluff in “Dreaming of Wisconsin.” Ask your students to look back at “Dreaming of Wisconsin.” Remind your students how the Meyer family was struggling to survive. Ask your students why Pa and Will didn’t cut down the four trees and sell them. *(They were not able to cut them down. The forester told them it would take ten oxen and a week to haul the trees up the bluff.)* Ask your students what the thieves in “Timber-r-r Thieves” used to cut and haul the trees. *(They used a chain saw to cut the trees. They used a winch and a truck to haul the logs up the bluff and transport the*

logs to the lumber mill.) Ask your students how long it took the thieves to cut and load the logs. (*The story doesn't give an exact time, but two men completed the job in less than one day.*) Discuss with your students how new technology made it easier and faster to harvest the trees.



such as wood chips used in landscaping or as fuel in the sawmill.

SAMPLE



ACTIVITY

1) Tell your students that in this lesson they will calculate how much wood was in each of the black walnut trees. They will also figure out the value of the trees in dollars and in terms of how many products can be made from the trees.

Tell your students that the biggest tree of the four was 28 inches in diameter. Draw a circle on the board that is approximately 28 inches in diameter. Explain to your students that when the tree was cut down, this is about how big around the stump was.

2) Next have your class walk into the hallway. Take a tape measure with you. Explain to your students that when a tree is harvested, not all of the tree can be used. When foresters measure the height of trees, they usually measure the amount that can be used. Tell your students that the tallest of the four trees had 64 feet of useable wood. Run the tape measure along the floor in the hallway to show your students what 64 feet looks like. Explain that if the tree were lying down, this much of the tree could be used to make products. Have several students hold hands and stretch themselves out along the measured distance. How many students does it take to fill this space?

3) Go back into the classroom and draw your students' attention back to the circle you drew on the board. Draw several rectangles inside of the circle to show how the round log gets sliced into pieces of lumber. Explain that since rectangles don't fit exactly into a circle, some of the wood is not used for lumber. Explain how the rectangles are different sizes in order to make the best use of the wood in the log. Some of the wood around the edges of the circle does not get used for lumber. It can be used for other wood products

4) Next, draw a board on the chalkboard that measures 12 inches wide and 8 feet long. Make note on the chalkboard that this board is also 1 inch thick. Ask your students to imagine a real board of this size. Explain that you will be using a board of this size as a unit of measure during the activity. Tell your students that you are going to tell them how many boards of this size can be made from each of the four trees in the story. Remind them that in reality, you cannot cut all the boards in one tree to be the same size and shape. However, the numbers you are giving them represent the equivalent number of boards IF they could all be the same size and shape.

TREE	NUMBER OF BOARDS IN THE TREE
1	120
2	70
3	65
4	110

5) Give each student a copy of the worksheet and allow them time to fill these numbers in on Table One on their worksheets. When they are finished, explain to your students that you would like them to use the table to figure out how much money each of the trees is worth. Show your students how to use a calculator to multiply the number of boards in each tree by the price per board to get the total value of each tree. Give your students time to complete this part of the table.

6) Next have your students use their calculators to add up the total number of boards in all

four trees and the total value of all four trees. Have them write those numbers in the corresponding space on the table. When everyone has completed Table One, review the answers with your students and answer any questions they have.

7) Explain to your students that people commonly use black walnut trees to make beautiful furniture. Tell them that they are going to figure out how many rocking chairs could be made from the four trees and how many dining room tables could be made from the four trees. Show them Table Two on their worksheet which will help them calculate this. Tell your students to transfer the total number of boards from Table One to the first column on Table Two. (Note: they will write this number twice.) In each row, they will use a calculator to divide the total number of boards by the figure given in the third column, which is the number of boards in each product. The result will be the total number of rocking chairs or dining room tables that could be made from the four trees. Give your students time to complete this table. When everyone has completed Table Two, review the answers with your students and answer any questions they have.



Note: This lesson is an oversimplification of how wood is measured and cut. The goal of the lesson is for students to gain a basic understanding of the volume of wood in a tree and its potential value.



ASSESSMENT

Ask your students to imagine they are reporters for the local newspaper in Chippewa Falls. Have each of your students write a one-page newspaper article about how Paul used his level head to help recover the stolen trees. Suggest to your students that they may want to use some of the information from the lesson to help their readers understand just how valuable the trees were. Tell your students to be sure to answer the following questions: Who are the main players in the story? What events took place? Where, when, why, and how did it all happen?

ANSWER KEYS

TABLE 1

TREE	NUMBER OF BOARDS IN EACH TREE	MULTIPLY (number of boards X price per board)	PRICE PER BOARD	VALUE OF EACH TREE
1	120	x	\$80.80	\$9696.00
2	70	x	\$80.80	\$5656.00
3	65	x	\$80.80	\$5252.00
4	110	x	\$80.80	\$8888.00
TOTAL NUMBER OF BOARDS:	365		TOTAL VALUE FOR ALL FOUR TREES:	\$29,492.00

TABLE 2

TOTAL NUMBER OF BOARDS	DIVIDE	NUMBER OF BOARDS IN EACH PRODUCT	HOW MANY PRODUCTS CAN BE MADE FROM THESE TREES
365	÷	4.2 boards per rocking chair	86 CHAIRS
365	÷	12.5 boards per table (8-person dining room table)	29 TABLES

CONCLUSION

When everyone understands Table Two, ask your students, "When Paul first told his parents he had seen something red on the farm, how did they respond?" (*They made a joke about it, suggesting that it may have been a UFO, or alien spaceship.*) The story explains how Paul helped solve the crime of the stolen trees. Ask your students, "Throughout the story, how did Paul's actions lead to the recovery of the stolen trees?" (*Paul was observant; he asked himself questions to try to explain the unusual things he observed, he used quick thinking when he camouflaged himself and marked the trees with his belt buckle, he moved quickly to report the crime to the police, he cooperated with the police to help them find the trees.*) Remind your students that in the end Paul's efforts paid off. The trees were recovered and Paul still had money to go to college one day. Paul was the hero of the story.

TABLE 1

TREE	NUMBER OF BOARDS IN EACH TREE	MULTIPLY (number of boards X price per board)	PRICE PER BOARD	VALUE OF EACH TREE
1		X	\$80.80	
2		X	\$80.80	
3		X	\$80.80	
4		X	\$80.80	
TOTAL NUMBER OF BOARDS:		TOTAL VALUE FOR ALL FOUR TREES:		

TABLE 2

TOTAL NUMBER OF BOARDS	DIVIDE	NUMBER OF BOARDS IN EACH PRODUCT	HOW MANY PRODUCTS CAN BE MADE FROM THESE TREES?
	$\frac{\cdot}{\cdot}$	4.2 boards per rocking chair	_____ ROCKING CHAIRS
	$\frac{\cdot}{\cdot}$	12.5 boards per table (8-person dining room table)	_____ TABLES