THE MULEY SAWMILL

Post & Lesson Plan

THE MULEY SAWMILL

Figure 1 A lumberjack in a hat climbs a tree. Image courtesy of Wisconsin Historical Society. WHI 138359.

If you grew up in Wisconsin, you may be familiar with some of Wisconsin's forests like the Black River forest, Menominee forest, or the Chequamegon-Nicolet forest. For hundreds of years these forests have provided Wisconsin with lumber used for building homes, factories, furniture, and more. Logging has been a big part of our state's economy, yet many people don't know much about logging. What do you think of when you hear logging? Paul Bunyan, the axe swinging, flannel wearing lumberjack? Log jams? There's more to logging than lumberjacks toppling trees. To create finished lumber, those trees have to go through a sawmill.

When lumberjacks cut trees down, the wood is splintery and sappy. Sawmills turn rough wood into useful planks. These planks can then be used in construction projects. In the 1800s, those projects might have been homebuilding, creating railroad ties, or even laying plank roads!

Before the invention of electrical power, many sawmills relied on water to keep their saw blades in motion. Waterpower was useful because it was readily available through Wisconsin's waterways. However, more efficient mills were created in the early 1900s that used **electricity**. This meant that many water-powered mills went out of use and were eventually torn down, but not all of them. The Wade House, near Greenbush, Wisconsin still has a working muley sawmill.

The muley sawmill was popular between the 1840s and 1910s for its speed and unique design. Instead of a rotating wheel blade, it used an up-and-down saw blade that moved at a rate of 325-375 revolutions per minute.

Figure 2 The turbine of the muley sawmill. Image courtesy of Wisconsin Magazine of History, Vol. 85, No. 4.

This was important for the people of Greenbush because the demand for logs was high. In the 1860s, for instance, the Sheboygan-Mississippi railroad was being built near Greenbush. The muley sawmill produced the pieces of wood between the metal tracks known as railroad ties.

An underwater **turbine** powered the muley sawmill. This type of sawmill was different than earlier types of sawing like the pit saw. The pit saw was simple. It relied on two people, a pit and a big saw. A log was laid across the pit. One person went into the pit and another stood on top of the log. The person in the pit would pull the saw down, cutting the log, and the person on top would pull it back up. This must have been awfully messy for the person in the pit.

Although pit sawing was cheaper, because it relied on manpower it was less efficient.
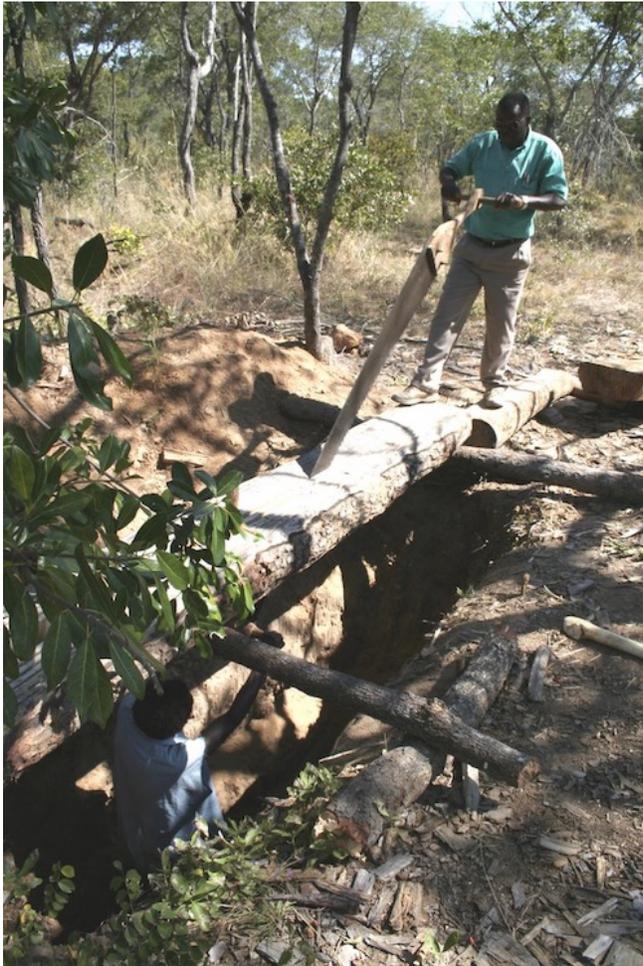

Figure 3 Two men use a pit saw in Kalomo town, Southern Province, Zambia. Photo by Amanit Phalloides - Namwianga Mission, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.pho?curid=1534654

Waterpower was important because it used a lot less human energy. The muley saw relied on water to turn a turbine that moved its saw blade. Making water turn a turbine is a complex process. It requires a dam and a turbine. The dam changes the flow of a stream or river and forces it towards a turbine. The water rushes by the turbine and causes it to spin. The turbines spins because it has blades on the inside that are movable. If this is a hard to picture, try and think about a merry-go-round. It spins when your hand grabs the railing and gives it a push. It's the same for a turbine. Water pushes against the blades of a turbine and cause it to spin just like your hand on the railing.

Once the turbine started moving, its motion spun a metal pole that had a gear on its head. This gear spun horizontally, but it was attached to a vertical gear too. The horizontal gear spun and brought the vertical gear into motion. This vertical gear started a leather band pulley system which caused the saw blade to move up and down.

Just like the pit saw, the muley sawmill's advantages did not last forever. Eventually faster and more efficient mills replaced the muley model. However, the sawmill in Greenbush split logs into lumber for over 60 years! Effective and durable, the muley is a steadfast part of the Wisconsin story.

Written by [Michael DeLeers](#)

Word Bank:

Chequamegon-Nicolet forest (She-wa-me-gon - Nik-O-lay): a 1,530,647-acre U.S. National Forest in northern Wisconsin in the United States.

Electricity: presence and flow of electric charge.

Turbine: a machine for producing continuous power in which a wheel or rotor is made to revolve by the flow of water or air.

Reading Comprehension Questions:

1) What is a muley saw? Where can you find a working one?

2) How would you compare the muley sawmill to a pit saw? Are there any differences?

3) What are the parts of a muley sawmill? How is it powered?

4) Why were most muley sawmills replaced?

The Muley Sawmill

Enduring Questions:

- How do objects help us understand Wisconsin history?

Essential Questions:

- What is the value of studying forms of production?
- What do forms of production tell us about the world today?
- What information can help us understand the past better?

Wisconsin Standard for Social Studies

Behavioral Sciences:

- Classify technologies based on intended use, access, and design, and how they might change people's lives (for better or worse). (**SS.BH4**)

Social Studies Inquiry Practices and Processes:

- Evaluate the strength of claim, evidence, and communication using criteria established by both teacher and student. **(SS.Inq4)**
- Explore opportunities for personal or collaborative civic engagement with community, school, state, tribal, national, and/or global implications **(SS.Inq5)**

Economics:

- Use economic reasoning to compare and contrast the costs and benefits of a decision. **(SS.Econ1)**
- Compare two product markets found in the local community. **(SS.Econ2)**

Geography:

- Summarize how location (absolute and relative) affects people, places, and environment. **(SS.Geog1)**
- Summarize how transportation and communication have changed economic activities over time. (**SS.Geog4)**

History:

- Use evidence to draw conclusions about probable causes of historical events, issues, and problems. **(SS.Hist1)**

- Describe patterns of change over time in the community, state, and the United States. (**SS.Hist2**)
- Explain how historical events have possible implications on the present. (**SS.Hist3**)

Content Questions:

- In what ways, did the muley mill help early settlers?
- Why did the muley sawmill fall into disuse?
- What commodities are made possible by sawmills?

Educational Goals:

- Understand the importance of sawmills in early Wisconsin
- Compare and contrast the developments of sawmills
- Understand the difference between different forms of energy

Activity #1: Wat(er) is your name?

- Using a map of Wisconsin, (below) find at least three towns or cities that have water in their name or are water related, e.g., Eagle River or Wisconsin Dells.
- Once you have identified three places, if you have access to a computer, try to research the early histories of your selected places to see if they relied on waterpower.
- If you are having troubles researching, it may be helpful to google search **"the name of your town or city + sawmill or watermill"** This search should produce some helpful results.
  - A lot of the results may be advertisements, so it will be good to click through a few websites.
  - Try to look for a webpage that discusses the history of a mill
- After finding results, it may be helpful to discuss your findings with a classmate
  - For instance, it might be helpful to discuss the different kinds of mills you and your classmate found. Are the mills you found the same? If different, what are the major differences between them?

Activity #2: Types of energy

- First, watch over these short videos about types of energy.
- After watching the videos, try and fill out a pros and cons chart!
1. **Nuclear Energy**: https://www.youtube.com/watch?v=FNNKhE1FNNM
2. **Waterpower:** https://www.youtube.com/watch?v=q8HmRLCgDAI (1st minute)
3. **Wind Power:** https://www.youtube.com/watch?v=niZ_cvu9Fts
4. **Coal Power:** https://www.youtube.com/watch?v=iN6LvH_4Q3g

Activity #3: Compare and Contrast

- Create a Venn diagram to compare pit sawing and the muley sawmill.
- Questions to consider: What kind of energy source do these mills use? How is the finished product moved away? How many people do you think work at each?

Bibliography

Special thanks to the Wade House for all their support in the research and writing process!

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Mark Knipping. "Cutting Edge History: Reconstructing the Herrling Sawmill." *The Wisconsin Magazine of History* 85, no. 4 (2002): 20-31. http://www.jstor.org/stable/4636985.

Activity #1: Wat(er) is your name?

WISCONSIN

POPULATED PLACES

500,000 – 999,999	● Milwaukee
100,000 – 499,999	● Green Bay
25,000 – 99,999	• La Crosse
24,999 and less	• Kewaunee
State capital	★ Madison

TRANSPORTATION

Interstate; limited access highway 39
Other principal highway
Railroad
Ferry

PHYSICAL FEATURES

Streams
Lakes

Highest elevation in state (feet) +1951

The lowest elevation in Wisconsin is 579 feet above sea level (Lake Michigan).

0 20 40 60 80 100 120 140 km
0   20   40   60   80 mi
Albers equal area projection

© Nations Online Project

Activity #2: Types of energy

Energy Source	Pros	Cons
92 U Uranium 238.02891 2 8 18 32 21 9 2		
COAL		
(wind turbine)		
(water mill)		