

# Exploring Our Heritage

## AN OHIO WATER MILL



### Learning Objective

Students will be able to analyze primary source documents and conduct research to make inferences about technological innovations made during the nineteenth century.

### Video Synopsis

In this *Our Ohio* heritage segment, students will visit a nineteenth century Ohio water mill that is still in operation today to learn how mills revolutionized production and impacted the economy.

### Teacher Background

The milling industry in Ohio began in the late eighteenth century near Marietta—Ohio's first permanent non-native settlement. The first mill went up only two years after Marietta was established in 1788. Ohio mills had originally used practices that were centuries old, but millers adopted many of the technological improvements of the industrial era. Innovations like turbine engines and new water wheel designs all served to make the milling process more efficient and productive.

Water mills were employed in various industries around the state, for example, some served as saw mills for hewing lumber, others milled flax, and others known as gristmills, were used to process grain. These gristmills were used to grind corn into meal and wheat into flour and were built in locations to maximize their source of power—water.

Since most mills were powered by water, they were located along waterways with a running or falling water supply like streams and rivers, and later, near canal locks. However, not all mills were powered by water, some were powered by wind or even livestock. No matter the power source, mills contributed to the growth and economic development of Ohio by making a number of processes more efficient.

Bear's Mill, one of the last functioning mills in Ohio today, was begun in 1832 and completed in 1849. Just one of six remaining mills in the state, this mill was at one time a center of commerce for area farmers who brought their wheat to be milled. The mill also acted as a gathering place for the community, and later, provided flour to Union soldiers during the Civil War. Today, the mill, which is located in Greenville, Ohio is open to the public.





## Ohio Academic Content Standards

### GRADE

**3**

#### **History**

##### *Growth*

3. Describe changes in the community over time including changes in:
  - G. Technology

##### *Obtaining Information*

1. Obtain information about local issues from a variety of sources including:
  - A. Maps;
  - B. Photos;
  - D. Newspapers;
  - E. Letters;
  - F. Artifacts;
  - G. Documents.

### GRADE

**4**

#### **Social Studies Skills and Methods**

##### *Obtaining Information*

1. Obtain information about state issues from a variety of print and electronic sources, and determine the relevance of information to a research topic:
  - E. Multimedia/Electronic sources.

2. Use a glossary and index to locate information.
3. Use primary and secondary sources to answer questions about Ohio history.

### GRADE

**5**

#### **History**

##### *Growth*

6. Explain the impact of settlement, industrialization and transportation on the expansion of the United States.

#### **Social Studies Skills and Methods**

##### *Obtaining Information*

3. Differentiate between primary and secondary sources.

##### *Thinking and Organizing*

6. Draw inferences from relevant information.

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## Instructional Procedure

(3-4 class periods)

### An Ohio Water Mill: What I Learned

1. Start by asking students if they know where flour, the main ingredient in bread and cakes, comes from. Explain that flour comes from wheat, and other starchy grains and is ground into a fine powder in factories.
2. Explain that bread has been a staple food for thousands of years now. Ask students to think about how people made flour before the mechanized processes we have today. Tell students that until machines were invented for this purpose, people had to grind wheat into flour by hand.
3. Now, explain how during the nineteenth century, innovations in technology led to a number of inventions that made some tasks more efficient. For example, water mills, which have been in use for hundreds of years, were improved through the use of turbine engines, allowing for more product with less manpower.
4. Based on the information in the Teacher Background section, describe how the milling industry developed in Ohio. Then explain how mills were important to the development of the state and the economy.
5. Finally let students know that they will be watching a short video in which they will see an historic water mill in action. Bear's Mill, which was constructed in the 1830s, is one of only a few functioning water mills today. Distribute the worksheet **An Ohio Water Mill: What I Learned** and have students complete the graphic organizer while watching.
6. After watching the video, review the worksheets together as a class.



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### Power For Sale

1. Begin by reviewing primary and secondary sources with the class. Ask students to offer examples of primary sources and collect their answers on the board. (Examples of primary sources include: photographs, letters, diaries, maps, newspaper articles, historic recordings, any original item that comes from the time period)
2. Explain that by analyzing primary sources we can discover many things about the past, what people wore, what was important to them, the types of things they used in daily life and more.
3. Now, organize students in groups of two or three. Distribute the **Power For Sale** primary source analysis worksheet and have students complete.
4. Review answers together as a class once everyone is finished. Emphasize that the document they analyzed is a primary source.

### Industrial Era Inventions

1. Ask students if they can think of an invention, or new development in technology that has changed the way people live. In the recent past, the internet has changed the way people communicate. Describe how before the internet, people spoke on the phone, sent letters in the mail, sent memos etc. The internet changed all of that.
2. Now, describe the importance of mills in the nineteenth century. Explain that if a town did not have its own mill, farmers would have to ship their wheat to a distant mill to be ground into flour, costing that farmer money for transportation.
3. Describe the Industrialization period to students. The Industrial Era began in the 1780s in Great Britain and spread throughout Europe and the Americas. This period of technological change and invention gained momentum throughout the early and mid nineteenth centuries, eventually merging into what historians refer to as the Second Industrial Revolution beginning in 1850.
4. Now, tell students they will be conducting research to learn more about important inventions and innovations from the Industrialization Era that changed the way people lived.
5. Distribute the Industrial Era Inventions Worksheet and have students conduct research using library books and the internet to find information about each Industrialization Era invention.



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### Answer Key

#### An Ohio Water Mill: What I Learned

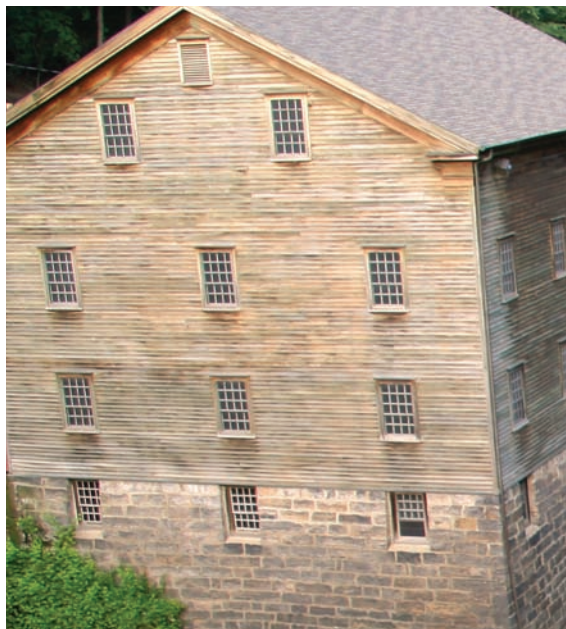
1. 1849
2. Six thousand dollars a set
3. Water powers the mill
4. Grist mills
5. 400 B.C.
6. The Union Army

#### Power For Sale

1. Primary Source
2. Steam Engines, Turbine water wheels, steel boilers
3. Water power and steam power
4. The James Leffel Company is located in Springfield, Ohio and also New York City
5. The water power was used to power the turbine water wheel and the steam powered engines and boilers.

#### Industrial Era Inventions

1. 1793, Eli Whitney. The Cotton Gin made it possible to harvest large quantities of cotton much easier and faster than by hand.
2. 1775, James Watt and Matthew Boulton. Uses steam pressure as power, later used for steamboats and locomotives.
3. 1790, Thomas Saint. Clothing could be produced quickly on a mass scale.
4. 1826, Joseph Niepce. Realistic images could be made in several minutes instead of relying on paintings and drawings to depict how things looked.
5. 1784, Edmund Cartwright. Allowed for mass production of cloth.



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### An Ohio Water Mill: What I Learned

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

**Instructions:** Read all of the boxes in the **Find Out** column below. Fill in the correct answers in the **What I Learned** column while watching the video *An Ohio Water Mill*.

FIND OUT	WHAT I LEARNED
When Was Bear's Mill Built?	
How much did the Millstones cost in 1848?	
What powers the mill?	
What are mills that grind grain called?	
When were water wheels first used?	
For what army did the mill provide grain in 1862?	

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## Power For Sale

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

**Instructions:** Below is an advertisement that dates to 1890. Read the document carefully then answer the questions that follow.

WATER POWER.

T H E

STEAM POWER.

**OLD RELIABLE**

# JAMES LEFFEL TURBINE WATER WHEEL

WITH LATEST IMPROVEMENTS.

MADE BY THE OLD AND CELEBRATED HOUSE OF JAMES LEFFEL & CO., LONG AND WELL-KNOWN FOR ITS LARGE EXPERIENCE, EXCELLENT WORK, PROMPT AND HONORABLE DEALINGS.

**WHO MADE ALSO**

UPRIGHT AND HORIZONTAL

## STEAM ENGINES AND STEEL BOILERS

MOST APPROVED STYLES.

Write for information about Water Wheels or Steam Engines, and for a finely illustrated pamphlet of either of them.

**ADDRESS**

**THE JAMES LEFFEL & CO.,**

**SPRINGFIELD, OHIO, U.S.A.,** Or, NO LIBERTY ST., N.Y. CITY.

1. Is this a primary or secondary source document?

\_\_\_\_\_

2. What is for sale in the advertisement?

\_\_\_\_\_

3. What two types of power are listed?

\_\_\_\_\_  
\_\_\_\_\_

4. What is the name of the company and where is it located?

\_\_\_\_\_  
\_\_\_\_\_

5. For what was the water power used? What do you think the steam power was used to power?

\_\_\_\_\_  
\_\_\_\_\_

Industrial Era Inventions

INNOVATION	WHO	WHEN	WHAT IT DID
Cotton Gin			
Watts Steam Engine			
Sewing Machine			
Photograph			
Power Loom			

