Exploring Our Heritage

OHIO WATERWAYS

Teacher Overview

Ohio's natural water resources have played very important roles in the development of the state and nation. The Ohio River for example, has important significance to the development of the country as it served as the main transportation route during westward expansion. The 981 mile long river flows through or along six states and is a tributary of the Mississippi River. The Ohio River marked the boundary of the Northwest Territory, and during the period of slavery designated the boundary between free and slave states.

Native Americans used Ohio's waterways as a means of travel and source of food and drinking water. Early settlers used Ohio's inland waterways as a means of transportation and exploration.
Today, waterways in Ohio still serve important functions. They provide our drinking water, provide a means of transportation for goods, and serve as a source of recreation for the community.

Ohio's waterways even provide access to world markets. International trade is critical to the state's economy. Lake Erie serves as an important international shipping hub via the Saint Lawrence Seaway –a series of canals that provides access to the Atlantic Ocean for Ocean going vessels. Lake Erie features nine ports, four of which are located in Ohio cities. The Saint Lawrence Seaway has been officially open since 1959 and serves a major overseas portal for the nation, and the state's export products.

For Ohio farmers and manufacturers, the ability to use waterways to transport products is critically important. In this country, over sixty percent of farm exports travel inland waterways. Maintaining barge access on our major waterways is crucial to our economy's success. But, we don't just rely on our waterways for transportation and economic success. Rivers, lakes, and streams are sources of drinking water and recreation for Ohio residents, and provide habitats for Ohio wildlife.

Video Synopsis

In this *Our Ohio* video segment hosts visit Ohio rivers and talk to National Park Service rangers to learn more about the history, importance, and use of waterways in Ohio. In addition, students will visit Port Toledo to learn about how ports function and the important role they play in state and national commerce.

Learning Objectives

Students will learn the location of Ohio's major rivers and lakes, identify the importance of waterways to the development of commerce and the state, learn about how our ports work, how international trade is made possible via waterways, as well as learn about the efficiency of different modes of transportation.

MAP OF Cincinnati AND SUBURBS AND COVINGTON & NEWPORT BELLEVUE, DAYTON, LUDLOW & BROMLEY/KY? M. & R. BURGHEIM. Publishers, Importers & Booksellers.

Ohio Academic Content Standards

Grade

3

Benchmark: Geography

1. Location: Use political maps, physical maps, and aerial photographs to ask and answer questions about the local community.

2. Location: Use a compass rose and cardinal directions to describe the relative location of places.

3. Location: Read and interpret maps by using the map title, map key, direction indicator and symbols to answer questions about the local community.

4. Movement: Identify systems of transportation used to move people and products and systems of communication used to move ideas from place to place.

Benchmark: Economics

5. Markets: Explain how the local community is an example of a market where buyers and sellers exchange goods and services.

Benchmark: Social Studies Skills and Methods

1. Obtaining information: Obtain information about local issues from a variety of sources including:
   a. maps
   g. documents

2. Locate information using various parts of a source including
   c. Illustrations
   d. keyword searches

4. Thinking and Organizing: Read and interpret pictographs, bar graphs and charts.

Grade

4

Benchmark: Geography

1. Location: Use a linear scale to measure the distance between places on a map.

2. Use cardinal and intermediate directions to describe the relative locations of places.

3. Use maps to identify the location of major physical and human features of Ohio including:
   a. Lake Erie
   b. Rivers
   c. The capital City
   d. Other major cities

8. Human Environmental Interaction: Identify how environmental processes and Characteristics influence human settlement and activity in Ohio.

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Benchmark: Economics

6. Markets: Explain why many jobs in Ohio depend on markets in other countries and why Ohio is a market for goods and services from other countries.

Benchmark: Social Studies and Methods

1. Obtaining Information: Obtain information about state issues from a variety of print and electronic sources, and determine the relevance of information to a research topic:
   a. Encyclopedias
   b. Dictionaries
   c. Multimedia/Electronic Sources

2. Use primary and secondary sources to answer questions about Ohio history.

6. Read and interpret pictographs, bar graphs, line graphs and tables.

Grade
5

Benchmark: Geography

2. Location: Use maps to identify the location of:
   a.   The Great Lakes

Benchmark: Economics

2. Scarcity and Resource Allocation: Explain that individuals in all economies must answer the fundamental economic questions of what to produce, how to produce, and for whom to produce.

4. Production, Distribution, and Consumption Markets: Explain how regions in North America become interdependent when they specialize in what they produce best and then trade with other regions inside and outside North America to increase the amount and variety of goods and services available.

Benchmark: Social Studies Skills and Method

6. Thinking and Organizing: Draw inferences from relevant information.

Materials
❑ **DVD player**
❑ **Television/Monitor**

Teacher Vocabulary

tributary	watershed	import	export
barge	port	commerce	

OHIO WATERWAYS

Procedure

ACTIVITY A: How We Use Our Waterways

1. Start by asking students how we use lakes and rivers in the state of Ohio today and write their answers on the board. (transportation of goods, recreation, drinking water etc.)

2. Based on the information in the overview, explain how Ohio's waterways were important to the creation of the state and the development of the nation.

3. Now, show the *Our Ohio* video segment "Ohio Waterways" and have students take notes while watching the video so that they will be able to answer the questions in **Worksheet A**.

ACTIVITY B: Map Analysis

1. Pass out **Map B** and the accompanying worksheet **"Ohio Waterways"** to the class. Students will need to use a dictionary and conduct research on the internet to answer some of the questions. Students may work in groups, or individually to answer the questions.

ACTIVITY C: What's Happening at Port Toledo

1. Start by writing the words import and export on the board. Ask students to define the terms and write their answers on the board as well.

2. Based on the information in the overview, explain how important Ohio's waterways are to the state's economy.

3. Next, describe how Lake Erie provides overseas access for export goods via the Saint Lawrence Seaway.

4. Finally, pass out **Worksheet C** and have students complete.

OHIO WATERWAYS

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Answer Key

ACTIVITY A
How We Use Our Waterways

1. Beautiful river; good river (both appear as translations; either answer is acceptable)
2. Early settlers used waterways for travel and exploration, as a source of drinking water, and for food
3. Native Americans fished the waterways and also hunted in the areas where animals would come to drink
4. Most cities are located near rivers because of ease of transportation which influenced settlement and commerce allowing cities to grow
5. Ports were a center of commerce, they were transportation hubs for immigrants and migrants, and also a source of jobs which attracted people to the area
6. Agricultural products such as grain and soybeans are exported, also manufactured products. Imports include ores and metals, as well as manufactured products
7. Ohio's waterways are a transportation asset because they are not at capacity like our roads —for instance, large shipments of cargo can be transported, via the Great Lakes there is an ocean route through the Saint Lawrence Seaway
8. Waterways must be kept clean because they are a source of drinking water, pollution can have harmful effects on the environment and affect wildlife (other answers may be acceptable)
9. Recreation, Transportation, Commerce, drinking water (other answers may be acceptable)
10. Lake Erie, there is a canal system with access from Lake Erie, the Saint Lawrence Seaway that provides access to the Atlantic Ocean

ACTIVITY B
Map Analysis

1. Tributary: A stream feeding a larger stream or lake
2. Watershed: a region or area drained by a body of water
3. Maumee River, Portage River, Sandusky River, Cuyahoga River, Grand River
4. Great Miami River, Little Miami River, Scioto River, Hocking River, Muskingum River
5. The Olentangy and Scioto Rivers
6. They are all located near waterways like rivers or lakes
7. Licking River, Mohican River, Tuscarawas River
8. a. Mississippi River, b. beautiful river or good river c. Northwest
9. a. Lake Erie b. fires c. Cleveland
10. a. five b. Native American Tribe c. Ohio, Pennsylvania, New York, Michigan

ACTIVITY C
What's Happening at Port Toledo

1. Grain, coal, general cargo
2. They are being shipped as exports
3. Fertilizer, salt, sand, metal ores
4. They are imports
5. Railroad
6. 302 gallons for each mode of transportation
7. 58 semi trucks
8. 865 semi trucks
9. The 15 ton barge because it can move the most amount of cargo in one haul. The environmental advantage is that there are less emissions, less pollution
10. They are much slower than semi trucks

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WORKSHEET A
How We Use Our Waterways

NAME:_____   DATE: _____

Directions: Use complete sentences to answer the questions based on the information in the *Our Ohio* video "Ohio Waterways."

1. What does the word "Ohio" mean in the Iroquois language?

    _____

2. How did early Ohio settlers use Waterways in the past?

    _____

3. How were rivers and lakes a source of food for Native Americans?

    _____

4. Near where are most major cities located and why?

    _____

5. Ports often grew into major cities. What are the reasons for this?

    _____

6. What types of things are imported and exported at the Port of Toledo?

    _____

7. Why are Ohio's waterways a transportation asset?

    _____

8. Why is it important to keep our waterways clean?

    _____

9. How do we use our waterways today?

    _____

10. What is Ohio's Great Lake, and how does this provide a route to the Atlantic Ocean for overseas trade?

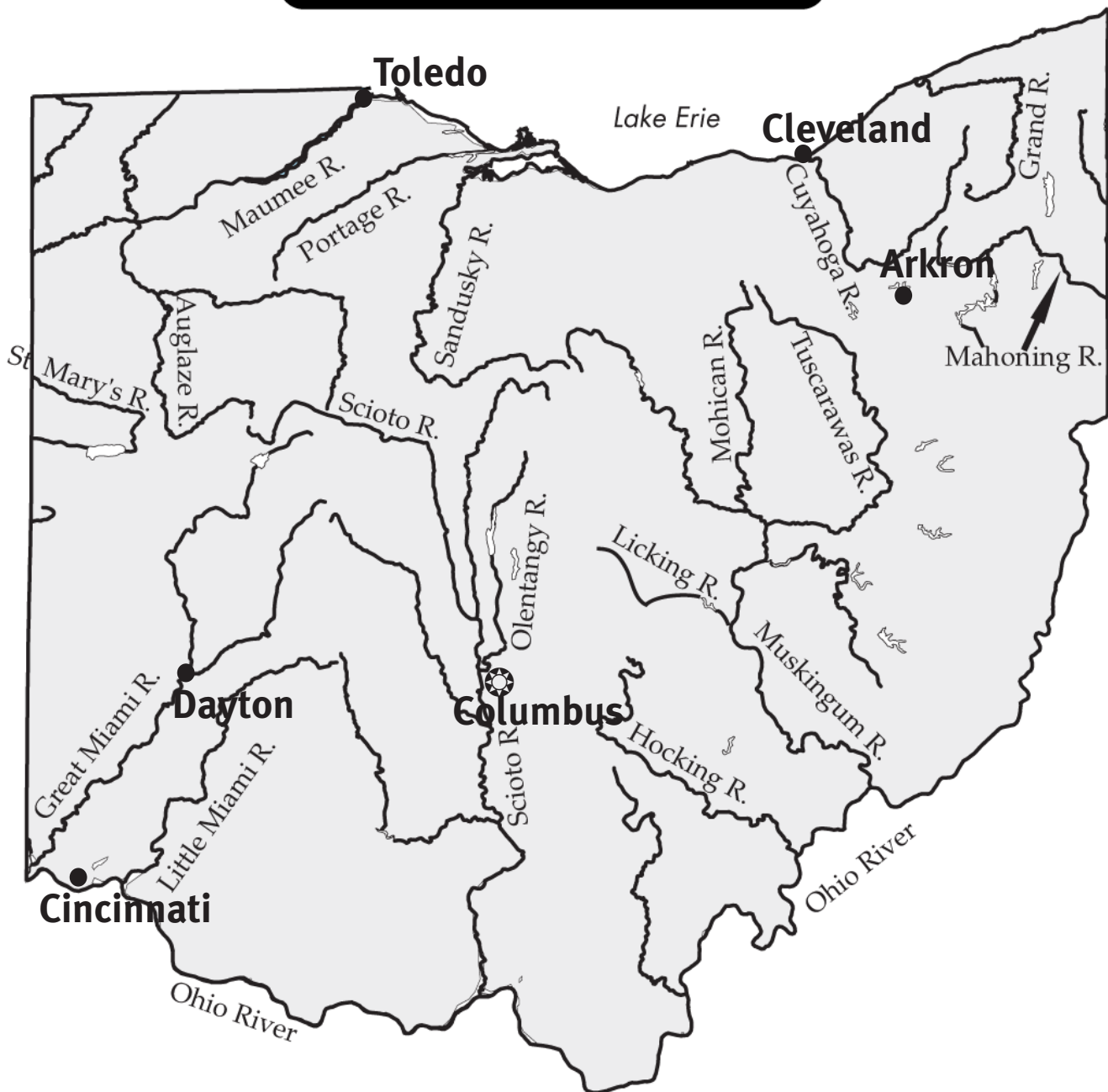   _____

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WORKSHEET B
Map Analysis

NAME: _____   DATE: _____

Map B

Ohio's Rivers

Toledo

Lake Erie

Cleveland

Grand R.

Maumee R.

Portage R.

Cuyahoga R.

Arkron

Sandusky R.

St. Mary's R.

Auglaze R.

Scioto R.

Mohican R.

Tuscarawas R.

Mahoning R.

Olentangy R.

Licking R.

Muskingum R.

Great Miami R.

Dayton

Columbus

Scioto R.

Hocking R.

Little Miami R.

Cincinnati

Ohio River

Ohio River

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WORKSHEET B
Map Analysis

NAME: _____   DATE: _____

Use a dictionary to define the following words:

1. Tributary [noun]:

2. Watershed [noun]:

Use Map B to help answer the following questions:

3. Based on the map, which rivers are tributaries of Lake Erie?

   _____

4. Based on the map, which rivers are tributaries of the Ohio River?

   _____

5. Between what two rivers is the state capital located?

   _____

6. The map includes the locations of Ohio's six largest cities. What do they all have in common?

   _____

7. Which rivers are tributaries of the Muskingum River?

   _____

Use the internet to research the following waterways and fill in the blanks for each question.

8. Ohio River
   a.   Is a main tributary of the _____ River.
   b.   Ohio is an Iroquois word meaning _____ _____.
   c.   The Ohio River was the southern boundary of the _____ Territory.

9. Cuyahoga River
   a.   Is a tributary of _____ _____.
   b.   Pollution such as oil and debris have caused several _____ on the river.
   c.   The Cuyahoga River is near the city of _____.

10. Lake Erie
    a.   Lake Erie is just one of the _____ Great Lakes.
    b.   Lake Erie is named after a _____ _____ _____.
    c.   Four states, _____, _____, _____, _____ border Lake Erie.

OHIO WATERWAYS

WORKSHEET C

What's Happening at Port Toledo?

NAME:_____   DATE: _____

Directions: Ohio is an important producer and exporter of agricultural and manufactured products. Ohio's economy depends on world markets –overseas cargo transportation is critical to success. In this worksheet, you will take a look at some of the activity at the docks of one of Ohio's ports on Lake Erie –Port Toledo, to learn about how the port system works. You will use the information in this table to answer questions 1-5 on **page 9**.

Dock Information for the Port of Toledo

Dock	Loading	Unloading	Railroad Connections
1	Grain	Fertilizer Rock Salt	Norfolk and Western Penn Central
2		Sand	Penn Central
3	Grain	Cement	B&O Penn Central
4	Coal		B&O Penn Central
5		Iron ore	B&O Penn Central
6	Grain		B&O
7		Sand Slag	Penn Central
8		Sand	Ohio Railway
9	Grain		B&O
10	General Cargo		Chesapeake

(Ohio Department of Transportation)

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WORKSHEET C
What's Happening at Port Toledo?

NAME:_____   DATE: _____

1. What were the types of things being loaded at the docks at Port Toledo?
   _____

2. What conclusions can you make about the things being loaded?
   _____

3. What types of cargo were being unloaded?
   _____

4. What conclusions can you make about the things being unloaded?
   _____

5. What other type of transportation was available for taking cargo to and from the port?
   _____

Transportation Mode Comparison

Mode of Transportation	Barge	15-Barge Tow	Jumbo Hopper Car	100 Car Train	Large Semi Truck
Cargo (tons)	1500	22,500	100	10,000	26
Bushels	52,500	767,500	3,500	350,000	910
Fuel (gallons)	453,000	6,804,000	30,240	3,024,000	7,865

(Army Corps of Engineers Data)
Look at the tables above to help answer questions 6-10.

6. How many gallons of fuel does each mode of transportation require for each ton of cargo?
   Barge: _____   Barge Tow: _____
   Jumbo Hopper Car:_____   100 Car Train:_____
   Large Semi Truck:_____

7. How many semi trucks would it take to transport the same amount of cargo as a barge?
   _____

8. How many semi trucks would it take to transport the same amount of cargo as a 15 barge tow?
   _____

9. Which mode of transportation is the most fuel efficient and why? What are the environmental advantages?
   _____

10. Barges average between 10-20 knots (1 knot equals 1.15 miles per hour). What is one disadvantage of barge transportation compared to semi trucks?
    _____