

Developed by Participants in the 2007 Great Lakes Maritime Transportation Summer Teacher Institute sponsored by the Great Lakes Maritime Research Institute (www.glmri.org)

Great Lakes Transportation Choices: Shipping v. Rail v. Trucking "Show Me The Evidence"

By Kathy Keeney

Topic: The advantages of using the Great Lakes for shipping goods and materials

Time: 1-2 class periods

Grade Level: Middle School

Lesson Overview:

Students need to understand the value of shipping using the Great Lakes instead of rail cars and trucks. Resources on the materials/fuel use/and emission production of these three types of transportation will be used to evaluate their benefits and disadvantages.

Learner Objectives:

Students will be able to:

1. Make connections between Waterborne, railway, and Transportation
2. Evaluate aspects of different types of transportation
3. Create a scale representation of three concepts
4. Work cooperatively with other students

Wisconsin State Standards:

Standard 2: Understands the interactions of science, technology and society 8.2.3

Standard 4: Understands the history and nature of science 8.4.1, 8.4.2

Standard 5: Understands concepts about the earth 8.5.1, 8.5.3, 8.5.10

Vocabulary tonnage, emissions

Materials:

- Graph paper (1/4" works best)
- Color pencils
- Scissors
- Glue
- Large white paper 18X24 – depending on the size graph paper squares

Procedures:

1. Read the information paragraph on transportation
2. Use the information to create a representation using graph paper
3. Using the table and scale, cut out the correct number of graph squares to represent the number of vehicles, fuel usage, and emission produced for each type of transportation.

4. Answer these questions:
- Which method of transportation used the most number of vehicles to transport 18,000 tons of cargo?
 - Which method of transportation had the fewest emission production?
 - If one ship were not used, how would this impact the railways and highways?

Information Paragraph – students should read before beginning the activity.

Transporting supplies to companies in a timely and cost effective manner is critical to the success of any economy. The ever-increasing cost of fuel, environmental concerns, and timely deliveries are the three priorities for any industry both in shipping and receiving materials. Waterborne transportation (shipping) has become the most efficient way to transport cargoes when compared to the railway and/or trucking industries.

This activity will compare the amount of tonnage (weight of cargo), the amount of fuel used, and the amount of emissions (air pollution) produced for each type of transportation.

For the Visual Representation

Step One: on the big sheet of paper, across the **TOP**, write these three categories:

Number of vessels/18,000 tons Amount of fuel (gallons) Amount of Emissions (tons)

Step Two: Down the **LEFT** edge of the paper, place these three types of transportation: (try to space them evenly down the side.)

Waterborne

Rail Cars

Trucks

Step Three: Using the scale below and the table below, cut out the number of graph paper squares for each topic.

- 1 square = 1 vessel/18,000 tons of cargo
example: 2 vessels/36,000 tons of cargo would be two squares
- 1 square = 10,000 gallons of fuel used
example: 30,000 gallons of fuel would be three squares
- 1 square = 1 ton of emission (pollution) produced
example: 4 tons of emissions would be four squares.

Table

	<u>#vessels/18,000 tons</u>	<u>Amount of fuel</u>	<u>Amount of Emissions</u>
Waterborne Vessels	1	7,167 gallons	1 ton
Rail cars	180	36,360 gallons	11 tons
Trucks	692	110,700 gallons	16 tons

Resources:

www.wcpa-ports.org

Wisconsin Commercial Ports Association: Playing a vital role in the flow of commerce.
Wisconsin Commercial Ports Association.