

## Lesson 3: Investigation of Shipwrecks

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Target grade: 6-8

**Lesson overview:** The goals of this lesson are to have students analyze shipwreck data to determine the cause of the wrecks, locations of shipwrecks in relation to lighthouses, cargo being shipped, and weather conditions that could have contributed to the accident.

**Objectives:** Students will research shipwrecks and lighthouses in the Great Lakes and plot their locations on a map. Students will graph the months during which the ships were lost, and then compare those data with weather conditions. Students will research the cargo being carried in each case to determine any mitigating factors.

### State of Michigan science standards

I.1.M.1 Generate scientific questions about the world based on observation.  
I.1.M.2 Design and conduct scientific investigations.  
I.1.M.5 Use sources of information in support of scientific investigations.  
II.1.M.1 Evaluate the strengths and weaknesses of claims, arguments, or data.  
II.1.M.2 Describe limitations in personal knowledge.  
II.1.M.3 Show how common themes of math, science, and technology apply in real-world contexts.  
II.1.M.4 Describe the advantages and risks of new technologies.  
II.1.M.5 Develop an awareness and sensitivity to the natural world.  
V.1.m.1 Describe and identify surface features using maps.  
V.1.M.5 Explain how technology changes the surface of the Earth.  
V.2.M.1 Use maps of the Earth to locate water in its various forms and describe conditions under which they exist.  
V.2.M.2 Describe how surface water in Michigan reaches the oceans and returns.  
V.3.M.3 Explain the behavior of water in the atmosphere.

### Materials needed per group of 4 students:

Map of the Great Lakes,  
Blue and red dot stickers,  
Computer with Internet capability,  
Graph paper

**Background info:** Nearly 5000 shipwrecks have been recorded 30,000 people have died in shipwrecks. Some of these are due to storms, collisions, fires, explosions, or hull failure. Some listed as shipwrecks were salvaged, repaired, and continued sailing. 24% of the shipwrecks occurred in Lake Michigan, and 23% in Lake Huron. The last recorded shipwreck was a tugboat in 2001.

**Pre-assessment:** Having students working alone, answer the focus question and then write any responses on the board. Discuss as a class, which responses seem reasonable and which ones could be further investigated.

**Focus question:** What do you think are the causes of shipwrecks? In which Great Lake do you suppose the most shipwrecks occur? Why?

**Attention getter:**

Read the following account from <http://greatlakeshistory.homestead.com> and ask students to find its location on a map of the Detroit River.

On October 3, 2001, the famous mail boat **J. W. WESTCOTT II** was making a routine transfer of a pilot to the Norwegian tanker **SIDSEL KNUTSEN**, upbound with gasoline. The tug apparently got caught in the freighter's wash, swamped and reportedly sank in 20 seconds. Two members of her crew went down with the vessel, while two river pilots were located by the tanker and rescued by the tug **STORMONT**. The tug was found upside down on the bottom the same day and preparations were being made to raise her immediately, as she lay in the center of the shipping channel at a relatively shallow depth. She was raised on Oct 29. The tug had been transferring mail and pilots on the Detroit River since being built, as part of the "mail-by-pail" delivery service begun in the 19th century and provided by the J. W. Westcott Co. since 1895.

Accident Place: off Old Rouge River mouth, Zug Island.

**Vocabulary:**

1. Wash: Turbulence in water caused by the motion or action of an oar or propeller.
2. Swamped: flooded

**Activity:**

1. For inquiry, students may investigate one of the questions that were defined after the pre-assessment question discussion, or do the following:
2. Students will be broken into groups of 4 and assigned 100 different Great Lakes shipwrecks, for example, group one will investigate the first 100 beginning with the letter A, the second group will investigate the first 100 beginning with the letter B. This is because there are nearly 250 recorded shipwrecks just with the letter A. Using the Internet, students will investigate their 100 shipwrecks in the Great Lakes. They will plot their wreck location on a map using numbered blue dots. They will plot on a map the location of lighthouses ([nightbeacon.com](http://nightbeacon.com)) using numbered red dots. They will create a key to show which dot corresponds to what ship and lighthouse. The key should include the name of the ship as well as the date it went down.
3. Students will find the dates the ships were wrecked, and using [boatnerd.com](http://boatnerd.com)
4. check the archived data to see if weather conditions caused the shipwreck.
5. Also using [boatnerd.com](http://boatnerd.com), students will determine the cargo that each ship was carrying (cement, ore, furs, grain, etc.).
6. Students will graph the dates of the shipwrecks, and using all of the above information, try to come up with logical explanations of the wrecks. They will also determine if lighthouses were erected before or after the shipwrecks.
7. Discuss the correlation between lighthouses and shipwrecks.
8. When was the last shipwreck? What was its cause?
9. Are there fewer shipwrecks now? Why or why not? (Students may suggest GPS, better navigational aids, and better vessel traffic service from the Coast Guard.)
10. Have students answer the question, "Can anything be done to reduce the number of shipwrecks?"

**Assessment:** Comparison of the data and explanations for the wrecks, maps of locations of shipwrecks and lighthouses, answers to questions, graphs.

## **Extensions**

Students can create an interactive map using a model or map of the Great Lakes and one color of miniature Christmas tree lights to show the locations of the shipwrecks, and a different color light to show the locations of the lighthouses. This would also reinforce electric circuits.

Students can construct models of boats using foil and load them with cargo (pennies). Waves could be created with a hairdryer or fan. How much load does it take before the ships capsize in the waves? Is the draft line of a ship determined in the same way?

Students can research:

- One particular shipwreck and find out where the crew was from.
- When GPS became commonly used and when lighthouses were phased out. Which ones (if any) are still in operation?
- How the Coast Guard currently help ships stay on course.

## **Resources**

<http://www.boatnerd.com/swayze/shipwreck/>

<http://www.nightbeacon.com/mapindexpage.htm>

<http://www.navcen.uscg.gov/>

<http://www.navcen.uscg.gov/enav/ais/default.htm>

<http://greatlakeshistory.homestead.com/home.html> (this site has graphs already completed for shipwrecks per lake, shipwrecks by cause, and shipwrecks by month)