



# Whitefish Point: Wrecks and Rescues



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## LESSON TWELVE

### Subject/Grade:

Grades 6-8, Math and Social Studies

### Duration:

Three class periods

### Materials needed:

*Per class:*

- 1 DVD or video: *Tragedies in the Mist or Ghost Ships of the Great Lakes*
- DVD player and projector or TV-VCR
- Glossary of shipping terms (Appendix)

*Optional Supplies:*

- Markers, colored pencils, colored paper, glue, poster board, transparencies
- Computers with internet access (1 per student or 1 per group)
- Computer Projector

*Per student or group:*

- Vocabulary Pyramids
- Data collection forms
- 2 sheets of paper & pencil

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## Lesson Overview

Students will research shipwrecks of Lake Superior, especially near Whitefish Point, and use their findings to create and analyze statistical data displays. Students will use “real-world” data to apply their mathematical presentation and data analysis skills. The lesson will demonstrate the essential role of mathematics in helping us to better understand our world.

## Learning Objectives

After this lesson, students will be able to

1. Collect shipwreck data either via the internet or by visiting the Great Lakes Shipwreck Museum at Whitefish Point.
2. Create various types of data displays using frequency table, scatter plot, box-and-whiskers plot, etc.
3. Analyze data to recognize patterns, trends, line of best fit, measures of central tendency.
4. Describe data: identify clusters, gaps, outliers, extremes, range.
5. Make data-based predictions or assessments from the results.

## STANDARDS



### Michigan Grade Level Content Expectations (GLCEs) Addressed

#### Grade 6 Math Strand A - Algebra

A.RP.06.08

Understand that relationships between quantities can be suggested by graphs and tables.

A.RP.06.10

Represent simple relationships between quantities using verbal descriptions, tables, and graphs

#### Grade 7 Math Strand D - Data and Probability

D.RE.07.01

Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.

D.AN.07.02

Create and interpret scatter plots and find line of best fit and use an estimated line of best fit to answer questions about the data.

D.AN.07.04

Find and interpret the median, quartiles, and interquartile range of a given data set.

#### Grade 8 Math Strand D - Data and Probability

D.AN.08.01

Determine which measures of central tendency (mean, median, or mode) best represent a data set; justify the choice made.

D.AN.08.02

Recognize practices of collecting and displaying data that may bias the presentation or analysis

#### Grade 8 Social Studies

8-U6.2.1

Use historical perspectives to analyze issues in the U.S. from the past and the present; conduct research on a historical issue or topic, identify a connection to a contemporary issue, i.e. movement of goods.

## Background

The Great Lakes system includes Lakes Ontario, Erie, Huron, Michigan, and Superior, their connecting waters, and the St. Lawrence River. It is one of the largest concentrations of fresh water on Earth. The opening of the St. Lawrence Seaway in 1959 allowed ocean-going vessels to travel through a system of canals from the Atlantic Ocean to the Great Lakes, as far as Duluth, MN in Lake Superior in order to access the great industrial and agricultural heartland of the North American continent. The entire distance totals 2,340 miles (3,768 km) to Duluth and 2,250 miles to Chicago, IL at the southern tip of Lake Michigan.

See “Surf Men of Shipwreck Coast” in this booklet for a short history of shipping on the Great Lakes and the establishment of the U.S. Life-Saving Service.

## Advance Preparation

If you cannot show a movie, download a story to read. Go to Shipwreck Stories Archives with more than 20 short stories to choose from---a good choice is “Lightkeepers Lost on the Lambton” because it is one of Lake Superior’s most tragic, yet nearly forgotten shipwrecks. <http://www.shipwreckmuseum.com/stories.phtml?artid=60>

Make copies of vocabulary pyramids or prepare Powerpoint slides with vocabulary pyramids for displaying with computer and projector. Use different words on each pyramid. Make 5 or more pyramids, depending upon number of students and amount of time available to play the game.

Make copies of data collection forms.

**Note to Teachers:** Students will need the skills and tools for collecting, organizing, summarizing, and analyzing



data such as using frequency tables, interpreting line and bar graphs and scatter plots. They should be able to analyze graphs to make predictions. Students should be able to make line plots, stem-and-leaf plots, box-and-whisker plots, bar graphs, and histograms. They should understand the three measures of central tendency (mean, median, and mode).

## Procedure

### Focus Questions

- *What caused shipwrecks on the Great Lakes?*
  - *Which Great Lake has the most shipwrecks? Why?*
  - *Which month has the most shipwrecks? • • Which time period had the most wrecks? Why?*
  - *Which type of vessel is shipwrecked most frequently?*
  - *How many total lives have been lost on the Great Lakes?*
1. Watch a movie about Great Lakes shipwrecks, *Tragedies in the Mist* or *Ghost Ships of the Great Lakes*, or read aloud *Shipwreck Stories* from the Great Lakes Shipwreck Museum website.
  2. Discuss some of the common causes of shipwrecks (*fog, wind, storms, shoals, navigational or human errors*). Where do many of the shipwrecks take place? What would it have been like to work on one of these ships? What information do archaeologists use to determine the identity of shipwrecks in the Great Lakes? (*The material the ship was made from, location of shipwreck, ship design.*) Which shipwreck features are usually still present, and which features are often missing? (*Visible features include masts, bow stem, anchor chain, cargo hold, deck beams. Missing features could be deck planking.*) Which is more important in identifying a shipwreck—historical or archival information? (They're both important).
  3. Play *Vocabulary Pyramid* game to generate interest, familiarize students with ship terms, and identify level of background knowledge. Tell students the topic of the terms is Great Lakes Shipping. Student should begin at the 50 point level and work their way up to the 200 point level. Give 15 – 30 seconds (depending on students' abilities) to solve for each word. One student gives clues to another student who tries to guess the word. After playing once through all the words, students switch roles, get a new pyramid of different words and play again. Highest score wins. See attached list for words and for example of pyramid. *Optional:* make a powerpoint and use a projector to display photos of maritime words and topics.
  4. Students will work in small groups or independently to research shipwrecked vessels—about 20 each. There are many ways to approach this research. All students may research the same vessels (see data collection tables: Shipwrecks at Whitefish Bay, or Whitefish Point), students may focus on shipwrecks at random in all of the Great Lakes system, or students may be assigned groups based on location (by lake: Ontario, Erie, Huron, Michigan, Superior, their connecting waters, and the St. Lawrence River).
  5. There are many different variables that are possible to research. Suggested data to collect for each vessel includes:
    - Type of vessel
    - Location of shipwreck (which Great Lake)



- Depth of shipwreck
  - Date of shipwreck
  - Cause of shipwreck (storms, strandings, fires, explosions, ice damage, collisions)
  - Vessel length
  - Vessel gross tonnage
  - Year of launch
  - Number of lives lost
6. Use *Websites for Student Use* to collect data and use the data collection forms to organize data. Forms with names of vessels lost at Whitefish Point and Whitefish Bay are included, as well as blank forms.
  7. Create at least one appropriate data display: stem-and-leaf plot, frequency table, scatter plot, circle graph, box-and-whiskers plot, or histogram. Possible data displays:
    - a. Stem-and-leaf plot of the largest vessels' length.
    - b. Stem-and-leaf plot of the largest vessels' gross tonnage.
    - c. Frequency table of shipwrecks by location (Great Lake).
    - d. Frequency table of ships lost by year.
    - e. Frequency table of shipwrecks by type of vessel.
    - f. Frequency table of shipwrecks by month.
    - g. Scatter plot of month and number of shipwrecks.
    - h. Scatter plot of century and number of shipwrecks.
    - i. Scatter plot of type of vessel and number of lives lost.
    - j. Scatter plot of location (lake) and number of shipwrecks.
    - k. Circle graph of the percentage of causes of shipwrecks.
    - l. Circle graph of percentage of shipwrecks by century.
    - m. Circle graph of percentage of wrecks by month.
    - n. Box-and-whiskers plot of the depth of the shipwrecks.
    - o. Bar graph of percentage of shipwrecks by month.
    - p. Histogram of number of lives lost per shipwreck.
    - q. Histogram of the number of wrecks and the percent of total losses.
    - r. Create your own choice of data display . . . as you can see the options are endless!
  8. Analyze data. Find the measures of central tendency (mean, median, and mode). Which measure of central tendency best represents the data? Explain your reasoning.
  9. If a box-and-whiskers plot is created, interpret the median, quartiles, and interquartile range.  
  
How is the data spread out? What is the range? Describe any trends.
  10. If a scatter plot is created, find the line of best fit and describe any obvious relationships.
  11. Make data-based predictions from the results. If the trend or relationship continues into the future, what could you conclude? For example, if a ship were to sink, where and when would it be most likely to happen?

## Assessment of Student Learning

Students will present their findings to the class. Students should show the data display they created and explain their interpretation of the data, including any trends or relationships identified. They may present by writing on the board, creating



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a poster, using overhead transparencies, or using an Excel spreadsheet to create data displays and show results to the class with a computer and a projector.

## Extensions

Create a poster identifying parts of a ship.

Create a map to display locations of shipwrecks on Lake Superior or the Great Lakes

Create a bar graph showing volume various cargos shipped on the Great Lakes or traveling through the Soo Locks.

Use a graphing calculator to make box-and-whisker plots.

Use Great Lakes & Seaway Shipping ([www.boatnerd.com](http://www.boatnerd.com)) to track your favorite vessel around the Great Lakes system.

## WEBSITES FOR STUDENT USE

Swayze, Dave. 1992. *Shipwreck!* Harbor House Publishers. Boyne City, Michigan

Great Lakes Seaway Shipping (Great Lakes Shipwreck File and Great Lakes Facts and Figures)  
<http://www.boatnerd.com>

Great Lakes Shipwreck Museum <http://www.shipwreckmuseum.com> (Shipwreck Stories Archives)

Great Lakes Shipwreck Preservation Society.  
<http://www.glsps.org/>

Great Lakes Under Water  
<http://www.greatlakesunderwater.com/shipwreckmap.html>

Lake Carriers Association (for information on ships, routes, cargoes, and volume shipped)  
<http://www.lcaships.com>



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## References

A&E History Channel. *Great Lakes Ghost Ship*  
DVD (50 min)

*Great Lakes Shipwreck Museum. Lightkeepers Lost  
on the Lambton – April 19, 1922.*  
<http://www.shipwreckmuseum.com/>

Hancock, Paul. (2004). *Shipwrecks of the Great  
Lakes*. Thunder Bay Press. Holt, MI.

Thunder Bay Marine Sanctuary & Underwater Pre-  
serve. *Tragedies in the Mist* DVD (30 min.) Alpena,  
MI. <http://www.thunderbay.noaa.gov/>



# Vocabulary Pyramid Game

## 50 point words

Beacon  
Lifeboat  
Buoy  
Shoal  
Capsize  
Shipwreck  
Rudder  
Mast  
Bow  
Cargo  
Freighter

## 100 point words

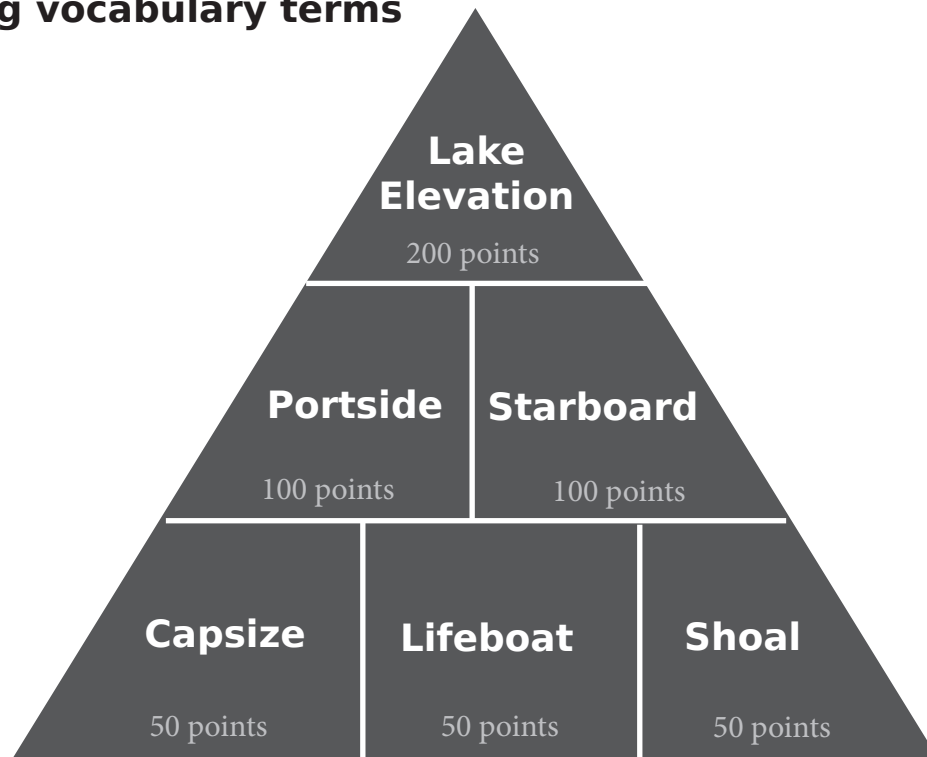
Galley  
Stern  
Portside  
Starboard  
Saltie  
Locks  
Taconite

## 200 point words

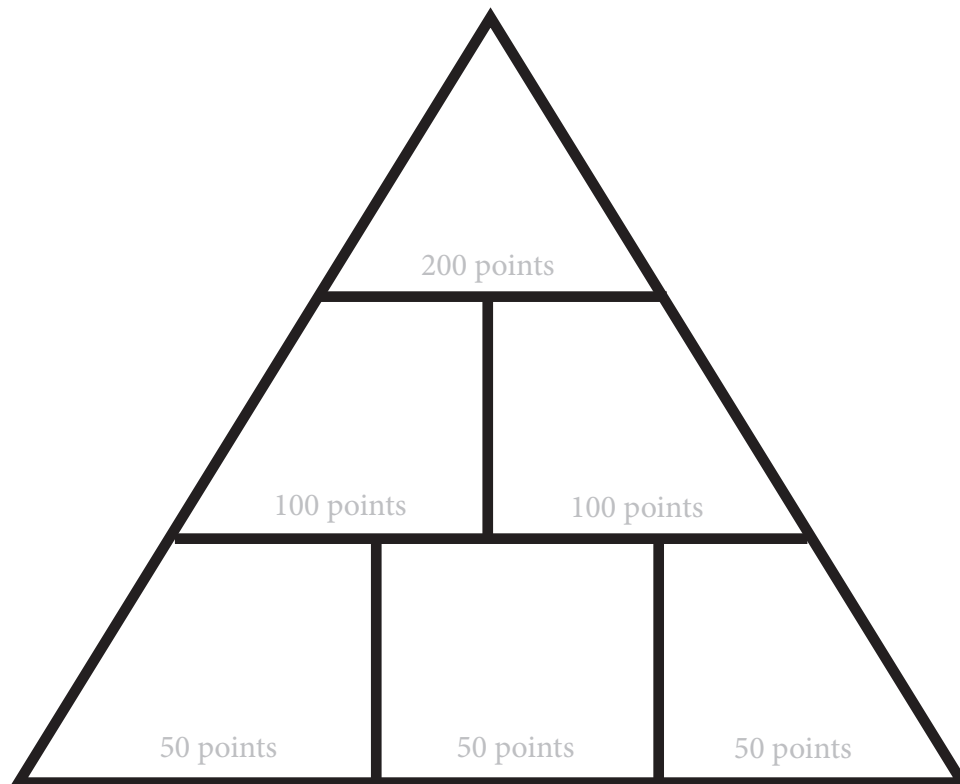
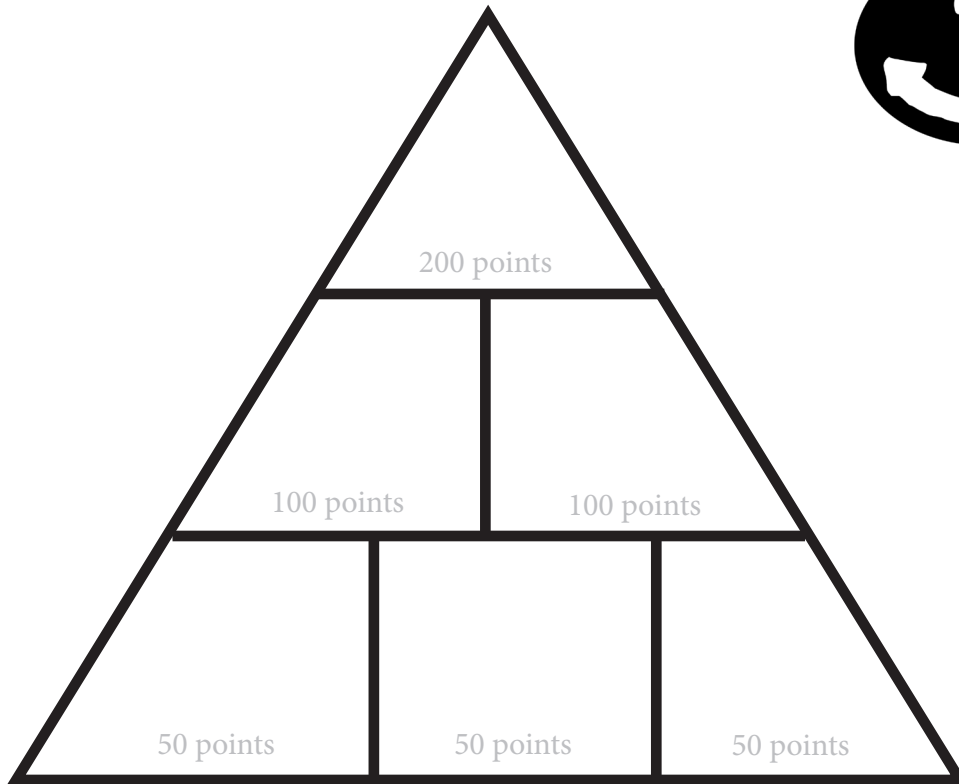
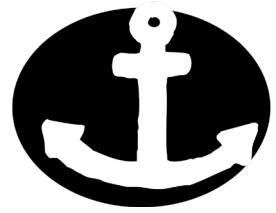
Peninsula  
Elevation  
Ballast  
Bulkhead  
Maritime  
Furlong  
Sagging  
Hogging  
Listing

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## Shipping vocabulary terms



# Shipping vocabulary terms



# SHIPWRECK DATA COLLECTION TABLE



	Name of Ship	Type of Vessel	Date sunk	Depth found	Type of loss	Loss of life
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Other Categories (variables) to research could include:

- Vessel's length
- Year of launch



# SHIPWRECKS AT WHITEFISH BAY

	Name of Ship	Type of Vessel	Date sunk	Depth found	Type of loss	Loss of life
1	Coast Guard					
2	Comet	<b>freighter</b>	<b>Aug 26</b>	<b>300 ft</b>	<b>Collision</b>	<b>11</b>
3	John B. Cowle	<b>freighter</b>	<b>July 12</b>	<b>220 ft</b>	<b>Collision</b>	<b>14</b>
4	William S. Crosth-					
5	Ora Endress					
6	Superior City					
7	Vienna					
8	Yosemite					
9	Zillah					
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

Source: *Shipwreck!* by David Swayze

**Types of Vessels:** freighter, schooner, tug, passenger, etc.

**Types of Loss:** gales or storms, strandings, fires or explosions, ice damage, collisions, or other



# SHIPWRECKS AT WHITEFISH POINT

	Name of Ship	Type of Vessel	Date sunk	Depth found	Type of loss	Loss of life
1	Alberta					
2	Algosoo					
3	Bennington					
4	Charlie					
5	Bertha Endress					
6	Edmund Fitzgerald					
7	Grey Eagle					
8	W.C.Griswold					
9	Harriet A Hart					
10	Huronton					
11	Invincible					
12	Major					
13	Milan					
14	Missoula					
15	John Mitchell					
16	Myron					
17	Alex Nimick					
18	Nucleus					
19	John M Osborne					
20	Julia Palmer					
21	Panther					
22	Pearl					
23	Plover					
24	Sattelite					
25	Saturn					
26	William F Sauber					
27	Servia					
28	C J Sheffield					
29	Adella Shores					

Source: *Shipwreck!* by David Swayze

**Types of Vessels:** freighter, schooner, tug, passenger, etc.

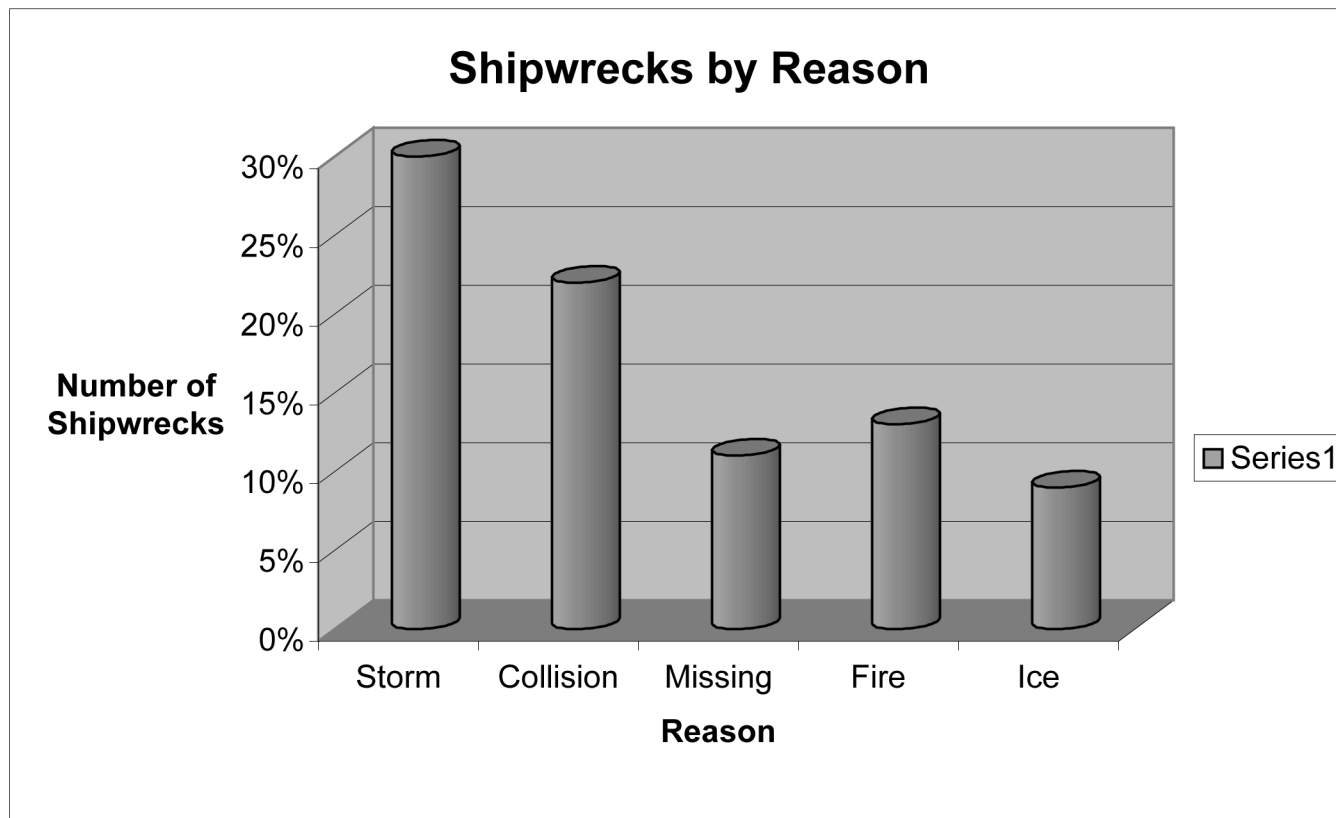
**Types of Loss:** gales or storms, strandings, fires or explosions, ice damage, collisions, or other



# Sample of student work

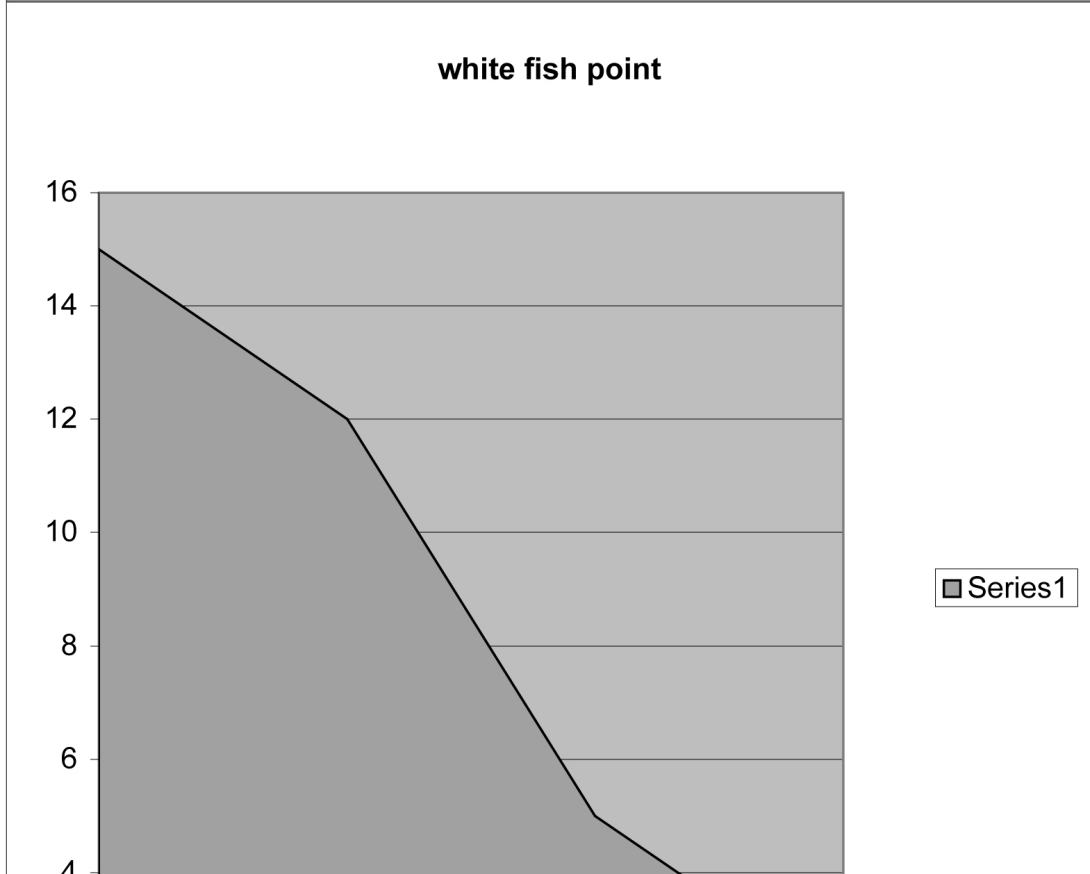
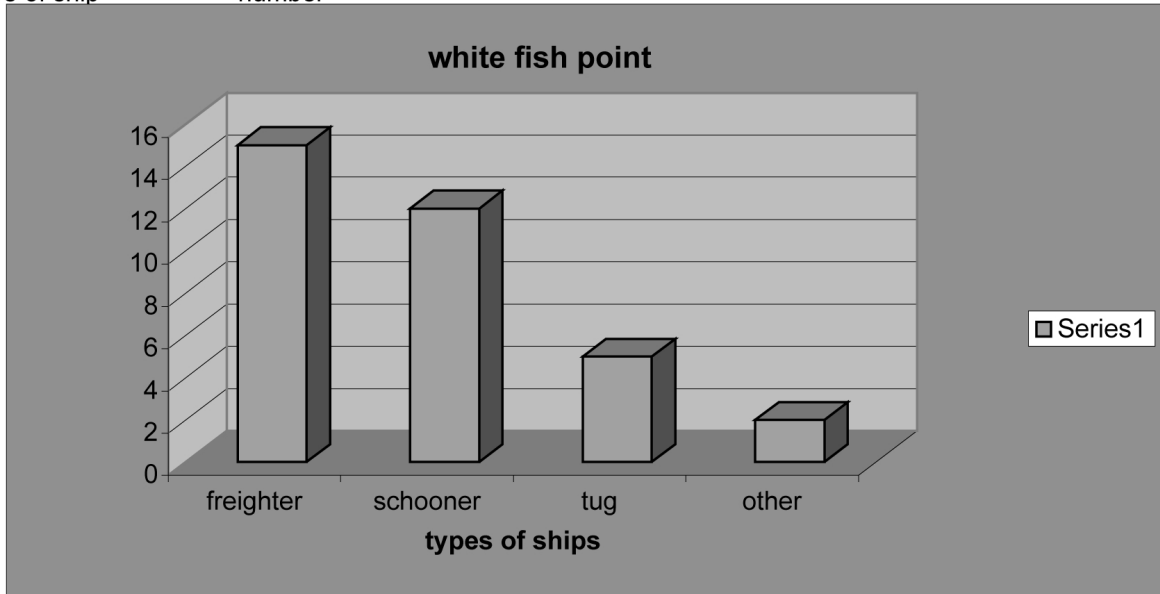
Vessel	Freq
Freighter:	15%
schooner:	12%
Tug:	2%
Bark:	1%
unrigged:	1%
steamer:	3%

loss	freq
Storm	30%
Collision	22%
Missing	11%
Fire	13%
Ice	9%



# Sample of student work

freighter	15		
schooner	12		
tug	5	\\	kc
other	2	~	
freighter	15		
type of ship	number		

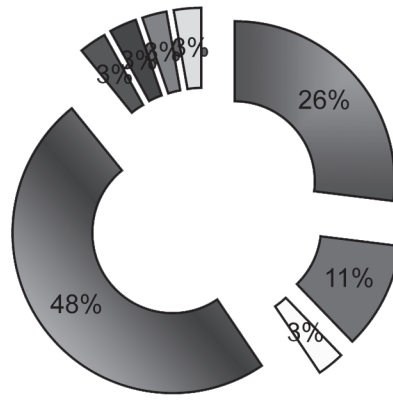


# Sample of student work

## Whitefish point shipwrecks

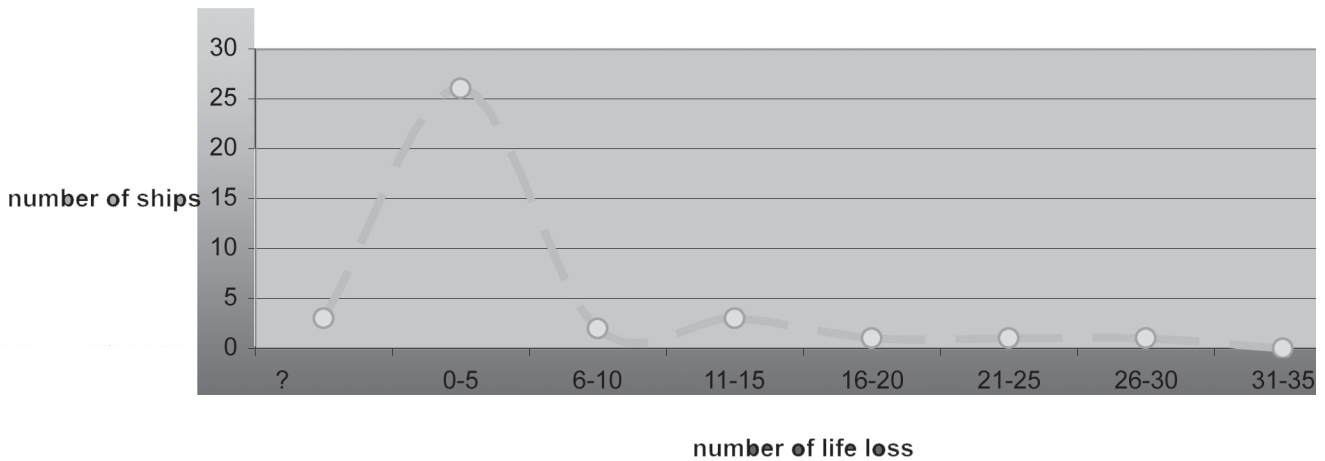
type of loss	number of loss
collision	10
fire	4
capsize	1
storm	18
hull failure	1
went missing	1
spang a leak	1
wrecked	1

whitefish piont shipwrecks



collision 
  fire 
  capsize 
  storm 
  hull failure 
  went missing 
  spang a leak 
  wrecked

whitefish point shipwrecks



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# Glossary of Nautical Terms

## Aft

Behind or back

## Aid to Navigation

Device that is external to the vessel whose purpose is to assist a navigator in determining position.

## Ballast

Weight added to lower ship's center of gravity in the water, to make it less top heavy when traveling without cargo. Fresh or salt water are most commonly used.

## Bathymetry

The topography of the lake or ocean bottom.

## Beacon

Light to aid navigation.

## Bearing

The direction to an object as measured from the boat.

## Berth

A place where a ship anchors or ties up to a dock.

## Boat

Smaller than a ship

## Bow

The front of the ship.

## Broach

When a vessel veers broadside to the wind and waves. See "listing."

## Buoy

A floating object moored to the bottom to mark a channel to aid in navigation.

## Buoyancy

Upward force on an object produced by the surrounding liquid and equal to the weight of the displaced liquid

## Cargo

Goods carried by a ship. General cargo is boxed, bagged, crated or placed on a pallet. Bulk cargo is

loose—such as grain, iron ore, taconite pellets, or coal.

## Cartographers

Map-makers.

## Channel

The deeper part of a river or harbor for ships to pass through; a route between two bodies of water.

## Chart

Map of navigable waterways; nautical version of a highway road map.

## Commodity

Anything that is bought and sold.

## Course

Direction in which a boat is intended to be steered.

## Danger signal

Five short toots.

## Day beacon

Unlighted fixed aid to navigation.

## Deck

Flat surface on the upper part of the ship where the crew and passengers can walk. Passenger ships have several decks, whereas a cargo ship (freighter) may have only one deck.

## Dredging

Removes bottom materials in order to keep navigation channels barrier-free and deep enough for ships to pass through. Dredging may disturb aquatic ecosystems by disrupting bottom-dwelling organisms, and may expose contaminated sediments previously buried on the lake bottom. Dredged materials require proper **disposal**.

## Dock

A long platform built next to the water as a landing place for ships.

## Elevator

A building for storing grain.



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**Export**

To send goods from one country for sale in another.

**Foghorn**

A horn blown during foggy weather to warn ships of danger.

**Grounded**

When a ship runs aground in shallow waters or on rocky outcrops on the .

**Harbor**

A place where ships may anchor and be safe from storms.

**Hatch**

Doorway on a vessel. Hatchcovers are on the deck of a freighter where the vessel is loaded with cargo.

**Head**

Bathroom on a vessel.

**Heading**

The direction the boat is pointing.

**Hogging**

Improper loading can cause vessel to “hog” causing a convex curve in hull.

**Hull**

Lowermost portion of a ship floating partially submerged.

**Import**

To bring goods into one country from another.

**Inter-modal transportation**

Moving cargo using more than one mode of transportation, such as truck, railway, ship, or plane.

**Invasive species**

Non-native species that are transported to a new area that typically have no natural predators (ex: zebra mussels).

**Leg of a journey**

Portion of a trip.

**Lifeboat**

Small craft aboard a ship to allow for emergency escape

**Lighthouse**

Marks entrance to harbor or warns ship captain of shallow water or obstructions.

**Line**

All ropes on a vessel are called lines.

**Listing**

Tipping to the side

**Locks**

Section of a waterway that can raise or lower water levels to allow vessels to move between water bodies of different elevations.

**Longshoreman**

A person who works on the waterfront loading and unloading ships.

**Marina**

Harbor where recreational boats may dock and pick up supplies.

**Maritime**

Having to do with sailing or shipping on; nautical.

**Maritime shipping**

Transportation of cargo via waterways.

**Navigate**

Steer or control the course of a ship.

**Navigational aids**

Device that is external to the vessel that assists a navigator in determining location; may include lighthouses, compasses, buoys, radios, etc.



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**Radar**

Radar helps ships find their way in the dark or in the fog.

**Pilothouse**

Enclosed structure on the deck of a ship from which it can be navigated.

**Port**

1. A city or town with a harbor for loading/unloading ships.
2. Left-hand side of a vessel, facing forward.

**Quarry**

Limestone and other stone used in construction and steel-making is mined from quarries and loaded into Great Lakes ships.

**Range**

Two visible objects in a line, or the distance to an object

**Sagging**

Improper loading can cause vessel to “sag” causing a concave curve in hull.

**Ship**

Vessel larger than a boat.

**Shipping route**

Route which a freighter travels from one port to another.

**Shipping**

Transportation of cargo via water, road, rail or airplane using a freighter, train, truck, or plane.

**Shipwreck**

Remains of a wrecked ship.

**Shipyard**

A place where ships are built or repaired.

**Sonar**

Technique that uses sound waves (usually underwater) to navigate, communicate or detect other vessels (SOund NAVigation and Ranging).

**Starboard**

The right-hand side of a vessel, facing forward.

**Stern**

Back of the ship

**Taconite**

Iron ore that is refined and formed into small marble-sized pellets

**Terminal**

Facilities at either end of a carrier line with management offices, storage warehouses, and freight or passenger facilities serving as a junction point with other lines or modes (methods) of transportation.

**Ton**

A unit of weight equivalent to 2,000 pounds.

**Track**

The path the boat has actually followed.

**Tugboats**

Help move ships around in harbors or rivers.

**U.S. Coast Guard**

Oversees programs to protect the Great Lakes' environment (pollution spills, invasive species control), security, navigation of foreign vessels, search & rescue, as well as the Vessel Tracking Service which knows where every ship is at any time in the Great Lakes system.

**Vessel**

General term for any watercraft.



