

Great Lakes/ Great Ships

Science

Mapping

Lesson One

Goal: The student will become familiar with Great Lakes' navigational charts while practicing topographical map skills.

Benchmark(s)

MS I.1 Generate scientific questions about the world based on observation.

MS II.1.5 Develop an awareness and sensitivity to the natural worlds.

MS V.1.1 Describe and identify surface features using maps.

Materials:

Poster or large photo of Lake Superior or other large body of water, showing a vast expanse of blue.

Photo or poster of a mountainous or hilly area

Road map

Topographic map of any hilly or mountainous area

Great Lakes Navigational Charts (US Dept. of Commerce #14500): one for each group

Construction type measuring tapes, at least two

Light colored string – at least 200 yards

Scissors

Black or dark colored markers

Background Information: This lesson is meant to extend lessons on using maps and especially practicing topographic map skills. Students should be familiar with the 5 features of a map. These include the title, scale, symbols for features, compass rose and legend or key. They should also be somewhat familiar with topographic lines, benchmarks, and contour intervals. This lesson will help them understand the depths and contours of underwater features, to introduce them to the measurement of fathoms, and realize some of the unique features of the five Great Lakes.

Room Arrangement: Flat topped desks should be arranged in tables of 4 or 6 before passing out charts. Flat topped areas of 4' x 6' are needed to spread out the charts. One chart should be posted at the room's front for teacher's demonstration. You will need access to a deep stairway or balcony. A second story window without a screen may also be used.

Hook: Display poster of mountainous or hilly area. Ask what a map of that area might look like. Students should begin a discussion of road maps and topographic maps. Take time to review and check for understanding of the five features of any map, and the different purpose of a road map and a topographic map. Be sure to review contour interval, benchmark and contour lines.

Now show the photo of the Great Lake. Ask what a map of this area might look like. Encourage the students to discuss what a road map of this area might look like. (a shore and a lot of blue!) Discuss what a topographic map would look like. (a shore and a lot of blue!) Now ask if anyone has seen a map of the bottom of a lake or ocean.

Lesson: Post the chart of the Great Lakes Region. Explain that today students will have a chance to work with these special maps. A map of the contours of the bottom of a body of water is called a **chart**. Explain that we will be calling these specialized maps charts.

Distribute one chart to each group. Charts should be laminated. If they are not, caution students not to mark on or otherwise damage the charts in any way.

Take some time to explore the charts and enjoy them. Teachers can decide ahead of time what they would like children to see, or they can take ideas from the class. Throughout this exploration, however, be certain students realize the measurement of the depths. Define **fathom**. You may ask students to look for the deepest part of the lake. (The deepest part of Lake Superior is marked 'deepest sounding' or 222 fathoms) or the shallowest. Define **shoal**. Take time to find the purpose of the chart. You may want to spend time looking at ports, shoreline cities, reviewing geographic terms such as **bay** and **peninsula**.

Because fathom is a new term, and students need a concrete awareness of it, have them make, as a group, a string that is 5 fathoms deep (long). Have several balls of thin twine, yardsticks or measuring tapes scissors and markers available. Have each group measure off their own string that is 5 fathoms deep, ($6 \times 5 = 30$ feet) cut it off, and mark each fathom with a dark mark. (There will be 4 marks.) Wind the 5-fathom string into a ball. Now, allow students to find a stairwell to drop their fathom strings down. Have them estimate the 'depth' of the stairwell in fathoms. In most schools stairwells will be between 2 and three fathoms deep. Ask them if this would be deep water. Take this understanding of depths back to the map and look again at the shoals. Find a spot where the water is about the depth of the stairwell. Is this water shallow? (Not if you are swimming!) Pose the question to the class: *Who or what would find a depth of 3 fathoms shallow or dangerous?*

From this point, begin a short discussion of the use of navigational charts by ships. Challenge the students to find out on their own, how big Great Lakes ships are, and how deep they go down in the water (**draft**). Ask them if a ship's draft changes at any time. Ask them to find out all they can and bring that information back to class the next day. Those that are interested, and have access to the computer may find out a good deal of information before tomorrow's lesson.

Carefully collect the materials.

Assessment: No formal assessment is needed for this lesson. Informal assessment will be through the students' enthusiasm for the exploration, and any information they may find about Great Lakes ships or charts on their own at home and bring back to class.