

## Great Lakes/ Great Ships

### Science

### Mapping

#### Lesson Two

**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.

Topographic map of any hilly or mountainous area

Great Lakes Navigational Charts (US Dept. of Commerce #14500)

Copy of Lake Superior from USDC # 14500 or Lake Superior nav. chart one per group

(Mark over the contour lines on this to be sure students can easily read them.) Ruler

Lined paper

**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 2. Students will be working with a partner on this project. One chart should be posted at the room's front for teacher's demonstration.

**Hook:** 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. Remind students that they have just learned the terms fathom, shoal and draft. Review these terms together and discuss who uses this specialized vocabulary and why. Ask students if any of them stepped up to the challenge to find out about a Great Lakes' vessels draft. Did any find out the size of these vessels? (Great Lakes vessels, or 'lakers' are up to 1000 feet long and usually draft about 27 feet.) Ask how many fathoms would a typical Laker need to be safe? (In perfectly calm water, they would need to have water at least 5 fathoms deep. Any wave action would require more depth.) Ask if the students can find a spot on the posted chart (#14500) where the water is that shallow.

**Lesson:** Distribute the copied charts of Lake Superior. Explain that they are going to draw an 'elevation' of the bottom of the lake. Explain that they can do the same with any topographic map to get an idea of the 'lay of the land' before they attempt a hike.

Have student locate and mark the deepest sounding.

Draw a straight line (with the ruler) from Munising to Peninsula Harbor, going through the deepest sounding lines.

Lay a sheet of white unlined paper against the line marked on the chart, and with a pencil, transfer all the depth lines to the paper's edge exactly. Check each group for accuracy.

When finished, lay the white paper along the side of a college-ruled sheet of paper, and transfer the dots to the edge of the lined paper. Draw a line three spaces above the papers edge (with the dots). This gives the student room to label their dots.

Contour depth lines are at 20 fathoms each. Each line will represent 20 fathoms.

Starting at the deepest sounding (similar to a benchmark on a topographical map) mark each dot with the depth in fathoms. Now 'graph' the depths by using each line as 20 fathoms. Connect the graphed lines with a smooth curved line. The lowest point of the lake will be the lowest edge of the marked line, and the shoreline will emerge at each end of the graph as the highest points at zero fathoms.

Be prepared to support the students as they work. This is a complex task they can do, and feel great success with, but most will have never done anything like it. If they follow the directions exactly, the bottom of the lake will emerge. Point out to them they can do this from any line drawn across a topographic map or navigational chart. This can be used to give them a good idea of what the land looks like.

Be sure they title their drawings, (a cross section of Lake Superior?) and label the graph intervals.

Collect the students' graphs and materials.

Assessment: Students can be assessed by the care and quality of their drawings.