Mapping the Ocean

OBJECTIVES

Students will use a formula to solve a problem. They will use a two-dimensional coordinate grid to represent data points and to graph a simple figure that communicates the concept of ocean depth.

MATERIALS

- ❑ copies of ***Mapping the Ocean*** data sheet on page 20 and ***Mapping the Ocean*** funsheet on page 21
- ❑ pencil and paper
- ❑ calculators

BACKGROUND

The ocean floor can be mapped by *sounding:* sound is sent from a ship's transmitter to the ocean bottom at an angle. The sound bounces back to the ship at the same angle and is picked up by a receiver. The speed of sound in sea water is about 1,507 meters per second. By using this information and applying a formula, ocean depth can be measured and mapped. In this activity your students will use data to map a section of the ocean floor.

ACTION

1. Describe the process of how the ocean floor can be mapped using sounding. Write the formula for measuring ocean depth on the board.
2. Distribute ***Mapping the Ocean*** data sheet and funsheet to each student. Explain that they are looking at data that was gathered from a ship that was moving straight out from shore. Every 10 km the ship stopped to collect sounding data.
3. Students use the sounding formula and the time information given to determine the depth of the ocean at each data point. They record these depths on the data sheet. *(Suggestion: ask students to round their calculations to the nearest 100 meters.)*
4. Next, students map the ocean floor on the ***Mapping the Ocean*** funsheet. They locate the distance from shore across the x axis, then plot the correct depth *(rounded to the nearest 100 meters)* on the y axis.

ANSWERS

distance	time	depth (m)	depth (km)
10	0.13	100	0.1
20	0.27	200	0.2
30	0.53	400	0.4
40	2.65	2,000	2.0
50	2.65	2,000	2.0
60	2.92	2,200	2.2
70	4.25	3,200	3.2
80	4.25	3,200	3.2
90	2.65	2,000	2.0
100	1.86	1,400	1.4
110	1.33	1,000	1.0
120	3.98	3,000	3.0
130	4.51	3,400	3.4
140	6.10	4,600	4.6
150	6.90	5,200	5.2
160	8.49	6,400	6.4
170	14.60	11,000	11.0
180	6.64	5,000	5.0
190	7.96	6,000	6.0
200	7.43	5,600	5.6

Name _____

Mapping the Ocean
data sheet

FORMULA FOR MEASURING OCEAN DEPTH

D = V x ½ T

D = depth (in meters)
T = time (in seconds)

V = speed of sound in water
= 1,507 meters per second

distance from shore (km)	time (sec)	depth (m)	depth (km)
10	0.13		
20	0.27		
30	0.53		
40	2.65		
50	2.65		
60	2.92		
70	4.25		
80	4.25		
90	2.65		
100	1.86		
110	1.33		
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