



## Mapping the Ocean Floor

### Background

Mapping the ocean floor can only be done by indirect methods. One such method is known as sounding. Sounding involves sending sound waves from the ocean surface down to the ocean floor. The sound waves are reflected from the ocean floor and are recorded back at the surface. Knowing the speed of sound in water, which is 1450 meters per second, and the time it takes sound waves to make a round trip, oceanographers can determine the ocean depth at any location along the ocean floor. The formula for this calculation is:

$$\text{Ocean depth in meters} = \frac{1}{2} \text{ time} \times 1450 \text{ meters/second}$$

### Objectives:

- To determine the depths of selected points on the ocean floor
- To complete a profile of the ocean floor
- To label sea floor features constructed in the profile.

### Materials (per student):

- Pencil
- Graph
- Calculator

### Procedure:

1. You have just started working for the United States Navy as an oceanographer aboard a ship named the USS Flip. Your mission is to map the ocean floor between New York and England.
2. During your trip, your echo sounder has recorded the time it took individual signals sent out from the Flip to return from the ocean floor. This information is given in the Data Table.
3. Use the formula provided to calculate the ocean depth at each point. Record this information in the Data Table.
4. Complete the accompanying graph by plotting the depth of each point on the ocean floor based on the values you entered on the Data Table. Connect all the points with a smooth line. This line represents a profile of the ocean floor between New York and England.
5. On your profile of the ocean floor, label the following features: abyssal plain, seamount, continental slope, mid-ocean ridge, continental shelf, trench, abyssal hill and continental rise.

## Observations and Conclusions

### Data Table

Point on the Ocean Floor	Time (sec)	Depth of Ocean Floor (m)	Point on the Ocean Floor	Time (sec)	Depth of Ocean Floor (m)
A	0.2		T	5.0	
B	0.2		U	4.8	
C	0.2		V	4.8	
D	1.6		W	4.0	
E	2.0		X	3.2	
F	3.0		Y	3.0	
G	4.0		Z	3.0	
H	4.0		a	2.0	
I	3.6		b	2.0	
J	3.2		c	3.0	
K	3.0		d	2.5	
L	3.0		e	3.2	
M	3.6		f	2.5	
N	4.0		g	3.2	
O	4.0		h	3.0	
P	6.0		i	3.0	
Q	8.0		j	3.0	
R	12.0		k	2.0	
S	8.0		l	2.0	



