

## Seals In-depth

### OBJECTIVE

Given data, students will use math skills to organize, analyze, and interpret the results from a research project tracking elephant seals.

### MATERIALS

*per student:*

- graph paper
- pencil
- pens or markers
- copy of *Seals In-Depth* funsheet on page 11

### BACKGROUND

Recent research on the diving patterns of male elephant seals has revealed amazing data. In 1989, a small microprocessor-based time-depth recorder attached to a male elephant seal recorded a dive of 1,800 m (6,000 ft.). Male elephant seal dives can last as long as 80 minutes.



### ACTION

1. Divide students into cooperative learning groups. Distribute materials and *Seals In-Depth* funsheet.
2. Ask each group to select one data set (dive depth, dive duration, or surface time). They complete the blanks on the funsheet; then design graphs or charts to represent the information. Groups should determine how to use the data in their graphs or charts (percentages, averages, frequency, or other). Groups then create two to three questions and two to three statements about the data and their work. (For example: does the data clump?)
3. After the groups have completed their data organization and analysis, have them present their work to other "scientists" in the class. Class scientists compare and contrast their work. Which graphs or charts represent the data? Are there other ways to show the information?
4. When review is completed, ask the class, "Why do scientists want to know this information?" *Scientists seek to understand natural history, behavior such as diving and migrating, feeding strategies, habitat use, and to determine if competition exists between humans and the animals for natural resources. Research like this helps people make decisions on fishery management, land use, water recreation use, and other policies.*

### ANSWERS

1. diving depth: about 389 meters
2. dive duration: about 23 minutes
3. surface time: about 3:08 minutes

Name \_\_\_\_\_

## Seals In-Depth

Note: Treat each data box separately; numbers do not correlate. Numbers represent only a portion of data collected.

DIVE DEPTH (m)	DIVE DURATION (min)	SURFACE TIME (min:sec)
75	77	1:56
410	8	2:25
118	12	3:30
379	19	3:45
210	24	7:21
105	49	0:30
362	9	5:47
978	28	2:19
402	18	2:31
357	23	3:22
382	10	2:56
713	22	0:41
541	6	3:31
349	20	5:02
451	14	1:18

### ESTIMATE AVERAGES

1. diving depth: \_\_\_\_\_ meters
2. dive duration: \_\_\_\_\_ minutes
3. surface time: \_\_\_\_\_ minutes: seconds

### CALCULATE AVERAGES

1. diving depth: \_\_\_\_\_ meters
2. dive duration: \_\_\_\_\_ minutes
3. surface time: \_\_\_\_\_ minutes: seconds

### What scientists learned from the diving patterns of six male elephant seals.

- Seals were at sea for an average of 130 days. They made a total of 36,233 dives. Seal one: 7,137 dives. Seal two: 4,292. Seal three: 5,961. Seal four: 3,812. Seal five: 7,714. Seal six: 7,317.
- Seals were submerged 21 hours out of the day. They spent 15 hours either ascending or descending and 6 hours at the bottom.
- Bottom time (time spent at the bottom of a dive) accounted for about 29% of the durations of each seal's dive. Only 140 dives exceeded 1,000 m and of these, 73% had bottom times of 1 minute or longer. Of the 40 dives that lasted 40 minutes or more, bottom time accounted for about 25%.
- The seals shared a diving depth mode of 350 to 450 m. An average of 41% of dives were to this depth. About 30% of dives were shallower. About 6% of dives were greater than 700 m.

This information is only a portion of the data obtained.