Splash of Math

Objective

Student practice problem-solving skills to break complex real-life problems into simpler parts. They make decisions about how to approach problems and use math skills, concepts, and strategies to find solutions.

Materials

- ❏ Copies of the Splash of Math funsheet
- ❏ Pencils
- ❏ Calculator

Action

1. Distribute the Splash of Math funsheets to your students. Explain any new vocabulary words before students begin. Correct answers are on page 2.

Deeper Depths

Students write their own story problems using animal behavior.

1. 10,460 km (6,500 miles) ÷ 56 days = 187 km per day (116 miles per day)
   187 km (116 miles) ÷ 24 hours = 7.8 or 8 km per hour (4.8 or 5 miles per hour)

2. 187 km (116 miles) x 7 days = **1,309 km (812 miles)**

3. 1 minute at the surface + 4 minutes diving = 5 minutes
   1 minute ÷ 5 minutes = 0.2 = **20%**

4. (10 sec. x total breaches) +
   (10 sec. x total bows) = n sec.
   (10 x 10) + (10 x 22) = n sec.
   100 + 220 = 320 sec.

5. total time
   2 hr. x 60 min. x 60 sec.
   = 7,200 sec.

   lobtail time:
   24 lobtails x 3 sec. 72 sec.

   72 sec. ÷ 7,200 sec. 0.01 = **1%**

6. 57 contacts with other dolphins
   x 3 sec. = 171 sec.

   time swimming alone
   = total time –
   (breaches + bows +
   lobtails + contacts)
   = 7,200 - (320 + 72 + 171)
   = 6,637 seconds
   (or **110.6 minutes or 1.8 hours**)

7. Average dive depth is about 389 meters.
   Average diving time is about 23 minutes.
   Average surface time is about 3:08 minutes.

8.
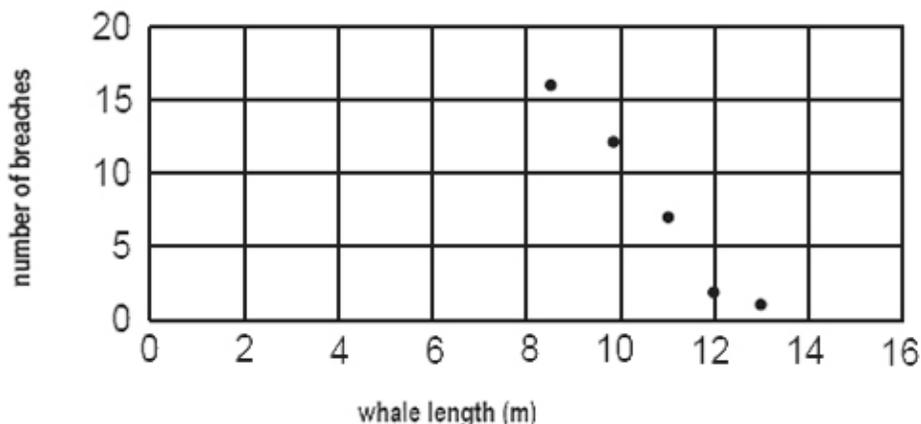
9. Based on this data, a student might predict that a 9-m whale might breach about 17–18 times.

Name_____

A. WATCH THE WHALES

Gray whales migrate each year from the Arctic to Baja California, Mexico and back: about 10,460 km (6,500 miles) each way. They leave Alaska waters in November and arrive off Baja California in January. The journey takes about 56 days. When traveling, they often breathe at the surface four times in about one minute, and then take a deep dive for four minutes.

Answer the following questions. Round answers to the nearest whole number.

1. What is a gray whale's average speed (in km per hour)?

2. On average, how far does a whale travel in one week?

3. What percentage of time does a whale spend at the surface?

B. TIME TALLY

You are an ethologist studying bottlenose dolphins. Last Tuesday you watched one dolphin for two hours and recorded these behaviors: 10 breaches, 24 lobtails, 22 bows, and 57 contacts with other dolphins. The dolphin spent the rest of the time swimming by itself.

Answer the following questions:

4. Breaches and bows last about 10 seconds each. During your observation period, how much time did the dolphin spend on these behaviors?

5. Lobtails last about 3 seconds each. What percentage of the total time did the dolphin spend lobtailing?

6. A contact with another dolphin lasted an average of 3 seconds. How much total time did the dolphin spend swimming by itself?

C. DEEP DIVERS

Research on the diving behavior of elephant seals has revealed amazing data. In 1989 a time-depth recorder attached to a male elephant seal recorded a dive of 1,581 m (almost a mile). Recently, researchers gathered the data at right.

7. First estimate, then calculate, the average dive depth, diving time, and surface time.

DIVE DEPTHS (m)	DIVING TIME (min)	SURFACE TIME (min)
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

D. BREACHES OF THE HUMPBACK

You are an ethologist studying the breaching of humpback whales in the western North Atlantic Ocean. You observed many whales and recorded the data at right for those that breached. You estimated the length of each whale and the total number of breaches in the breaching sequence.

WHALE	LENGTH	NO. BREACHES
1	12 m (39 ft.)	6
2	8.5 m (28 ft.)	20
3	11 m (36 ft.)	11
4	9.8 m (32 ft.)	16
5	13 m (43 ft.)	5

8. Using this data, graph number of breaches vs. length for these five whales.

9. Given a whale 9 m (29.5 ft.) in length, predict how many times it might breach in sequence.