

# Shamu Math

## OBJECTIVES

Students demonstrate that numbers can be used to describe various quantities and relationships between quantities.

Students gain experience adding, subtracting, multiplying, and dividing – building their understanding of how numbers are put together and taken apart.

Students connect what they know to symbolic representation using number sentences.

It's showtime! SeaWorld animal trainers send whales into the main pool to start the show.

## MATERIALS

- copies of *Shamu Math* funsheet, page 15 (one per cooperative learning group)
- pencils and paper



## BACKGROUND

The Animal Welfare Act establishes habitat requirements for all oceanariums including SeaWorld. SeaWorld's killer whale facility exceeds these required guidelines. One of the largest zoological killer whale habitats in the world, the Shamu Stadium complex at SeaWorld San Diego holds about 26.5 million liters of continuously filtered sea water. It includes the four pools shown in the diagrams on the Shamu Math funsheet, plus a fifth breeding and research pool. Gates between the pools can be opened or closed.

There are ten killer whales at SeaWorld San Diego: Corky, Orkid, Kasatka, Ulises, Takara, Splash, Nakai, Keet, Sumar, and Kohana. Each day, animal trainers feed the whales about 580 kg of fish and squid.

## ANSWERS TO PAGE 14

### Exercise #1

Number sentences:

$$\begin{array}{lll} 0 + 6 = 6 & 1 + 5 = 6 & 2 + 4 = 6 \\ 3 + 3 = 6 & 4 + 2 = 6 & 5 + 1 = 6 \\ 6 + 0 = 6 & & \end{array}$$

### Exercise #2

Two killer whales go into the main show pool:  $6 - 2 = 4$  left in holding pools

One more killer whale swims into the show pool:  $2 + 1 = 3$  now in the show pool

The number of killer whales left in the holding pools:  $4 - 1 = 3$

### Exercise #3

If the same number of people are sitting in each row,  $22 \div 2 = 11$  people in each row

Orkid splashes  $6 \times 11 = 66$  wet people

Ulises splashes  $9 \times 11 = 99$  wet people

### Exercise #4

Six buckets of fish per show, three shows per day:  $6 \times 3 = 18$  buckets of fish

In kilograms,  $18 \times 14 = 252$  kg during shows

Food eaten while not doing shows:  
 $580 \text{ kg} - 252 \text{ kg} = 328 \text{ kg}$



## ACTION

1. Distribute *Shamu Math* funsheets.
2. Read the exercises below to students. Work through the problems either as a class or in cooperative learning groups. Students use the funsheet to do Exercise 1.
3. After each exercise, ask student volunteers to explain to the class how they worked out an answer.

### Shamu Math exercises

#### Exercise #1

About a half-hour before the Shamu show is about to start, trainers move Nakai, Keet, Sumar, and Kohana to the research and breeding pool and all the other whales to holding pools A and B, then close the gates. How many different ways can the trainers place the six whales in pools A and B? Use X's to represent killer whales, and mark the whale pool diagrams to show all the various possibilities of where the six whales might go.

How can you communicate how many killer whales are in each pool using numbers and symbols? (*Show students how they can write number sentences that describe how many whales are in each pool.*)

#### Exercise #2

To start the show, Orkid and Ulises go into the main show pool to do bows. Now how many killer whales are left in the holding pools?

Next, Takara swims into the show pool to splash the audience. Now how many killer whales are in the show pool? In the holding pools?

Can students create a number sentence to show each of these situations?

#### Exercise #3

During the Shamu show, Orkid splashed six rows, Takara splashed two

rows, and Ulises splashed nine rows. If the same number of people are sitting in each row, which whale got the most people wet?

(*For grades 2-3*) Takara got 22 people wet.

- ◆ If the same number of people are sitting in each row, how many people does one row hold?
- ◆ How many people did Orkid get wet? How many people did Ulises get wet?
- ◆ Can students create number sentences for each situation?

#### Exercise #4 (*For grades 2-3*)

The whales are fed throughout the day, including during shows. During the first show the trainers feed the whales six buckets of fish. Each bucket holds about 14 kilograms of fish. If there are two more shows today (a total of three shows), how many buckets of fish will the whales eat during all three shows? How many kilograms of fish is that?

Can students create a number sentence to communicate how many kilograms of fish the whales eat during three shows?

In one day the killer whales eat about 580 kilograms of fish. How much fish will they eat while they are not doing shows? Create a number sentence that shows how much fish the killer whales eat while they are not doing shows.

# Shamu Math

About a half-hour before the Shamu show starts, trainers move six killer whales to holding pools A and B. How many different ways can trainers place the whales? Use X's to represent killer whales and mark the whale pool diagrams to show all the possibilities of where six whales might go.

