Lesson 5: Waves and Currents

☐ Getting Started

Today you are going to learn about motion in the ocean. Have you ever wondered why there are waves at the beach and why the waves are higher at some times of day than at others?

Stuff You Need

- ✓ *Oceans for Every Kid* by Janice VanCleave
- ✓ drinking straw
- ✓ scissors
- ✓ unsharpened pencil
- ✓ colored pencils or markers
- ✓ large rectangular, glass baking dish
- ✓ tap water
- ✓ watch or timer* (Activity 1 - optional)

Ideas to Think About

- How are the lives of living things impacted by the ocean?

Things to Know

- Water waves are caused by energy passing through water that makes the water rise and fall.
- Currents move water and objects across the ocean.

☐ Reading and Questions

Read pages 77-79 in *Oceans for Every Kid*. Answer these questions.

1. What is a water wave?

_____

_____

_____

2. Why do waves break on the shore?

3. How are the biggest waves (tsunamis) started?

Activities

☐ Activity 1: Waves and Energy

Water waves are not moving toward the shore but are actually moving up and down. Do the "Bobber" activity on pages 83-84 of *Oceans for Every Kid*. On page 84, the book explains that while wave energy is moving forward and backward, water and the bobber (straw) move in an up and down motion.

☐ Activity 2: Tsunami in Thailand

Underwater volcanoes and earthquakes form tsunamis. Research the incredible tsunami that hit Thailand in 2004. Online you can find pictures of how the tsunami damaged the geography of the land and how the communities were affected. Many volunteers across the world gave time and money to help the victims of the tsunami. Complete the page, "Tsunami in Thailand."

☐ Reading and Questions

Read pages 65-70, including "Let's Think it Through" and "Exercises" in *Oceans for Every Kid*.

1. Look up "ocean current" in the glossary of the book. What is the difference between current and a wave?

2. What causes surface currents in the ocean?

3. What is the difference between a cold current and a warm current?

☐ **Activity 3: Map of Currents**

Label the oceans on the "Map of Ocean Currents" page. Sketch the currents as shown on page 70 of the book. Make the currents in the Northern Hemisphere a different color from the Southern Hemisphere currents.

☐ **Wrapping Up**

Think about the difference between a wave and a current. Do you think boats are dependent on waves or currents? Why? Can you think of ways that ocean organisms might be affected by waves and currents?

Tsunami in Thailand

What caused the tsunami?_____

_____

_____

_____

Did the people have warning that it was coming? _____ Why or why not? _____

_____

_____

_____

_____

How many people died?_____

What damage did the storm cause on manmade and natural structures? _____

_____

_____

_____

_____

How did people around the world help the tsunami victims? _____

_____

_____

_____

Why do you think it is important that Americans help people in other countries who experience tragedy? _____

_____

_____

_____

_____

_____

MAP OF OCEAN CURRENTS

What is the difference between the currents in the Southern Hemisphere and those in the Northern Hemisphere?

Parent Overview

Lesson 5: Waves and Currents

Getting Started

? Big Ideas

- How are the lives of living things impacted by the ocean?

Facts and Definitions

- Water waves are caused by energy passing through water that makes the water rise and fall.
- Currents move water and objects across the ocean.

Skills

- Recognize that the geography of water and land impacts living things. (SS)
- Locate geographical places on a map. (SS)
- Recognize that waves are a form of energy. (S)

Introducing the Lesson

Tell your child that today he will study the motion of the ocean. If your family has been to the beach, discuss what the waves were like.

Reading and Questions (Answers)

1. What is a water wave?
   - A water wave is a disturbance on the surface of the water that repeats. The water moves up and down but not forward and back.
2. Why do waves break on the shore?
   - When a wave passes through shallow water, the lower portion rubs against the ground and slows down. The top of the wave keeps going and topples over.
3. How are the biggest waves (tsunamis) started?
   - By underwater volcanoes, landslides, or earthquakes.

Outline of Activities and Answer Keys

Activity 1: Waves and Energy

Your child will conduct the activity described on pages 83-84 of *Oceans for Every Kid*. Assist him as needed.

Activity 2: Tsunami in Thailand

Help your student locate information about the tsunami that hit Thailand in 2004.

Reading and Questions (Answers)

1. Look up "ocean current" in the glossary of the book. What is the difference between a current and a wave?
   - A wave is energy that moves through water, and a current is the continuous movement of ocean water. Waves move water up and down and currents move water and objects across the ocean.
2. What causes surface currents in the ocean?
   - Wind.
3. What is the difference between a cold current and a warm current?
   - Warm water currents move away from the equator. Cold water currents move toward the equator.

Activity 3: Map of Currents

On this page your child will sketch the directions of the currents found in the oceans. You can check his labeling using the diagrams on pp. 15 and 70 of *Oceans for Every Kid*. Your child should have also answered the question found on the sheet: What is the difference between the currents in the Southern Hemisphere and the Northern Hemisphere? (In the Northern Hemisphere, currents tend to move clockwise, while in the Southern Hemisphere they tend to move counter-clockwise.)

Wrapping Up

Questions to Discuss

- What causes currents? (The wind, the Sun, and the rotation of the earth impact currents.)
- What makes a wave crash? (Near the beach the water gets more shallow so the bottom of the wave starts to lose speed and drag along the ground while the top of the wave is still moving quickly. Eventually the wave curls over itself and breaks.)

Things to Review

Review the fact that waves are energy and discuss the difference between waves and currents. Ask your child if he can think of ways waves and currents might affect ocean organisms.