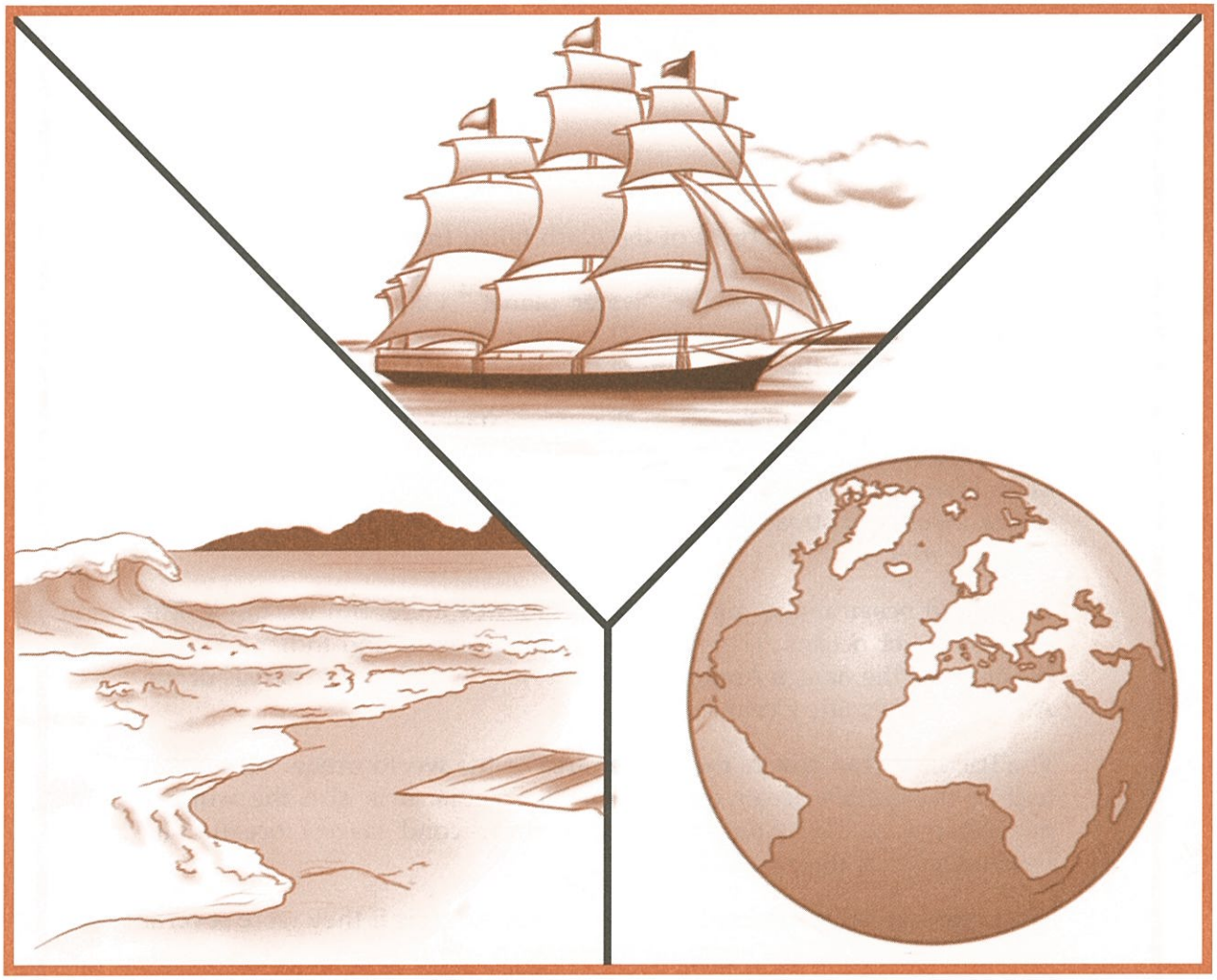
Lesson 1

What is the hydrosphere?



KEY TERMS

hydrosphere: water part of our planet

ocean currents: streams of water flowing in the ocean

LESSON 1 | What is the hydrosphere?

Have you ever seen pictures of the earth taken from space? You can see clouds, land, and water. In fact, you see mostly water. That is why the earth is sometimes called the "water planet." Only 29 percent of the earth's surface is land. The rest—71 percent—is water. We call the water part of our planet the **hydrosphere** [HY-droh-sfeer].

The hydrosphere includes all of the salt water and fresh water on the earth. Salt water makes up about 97 percent of all the water on the earth. Most of the salt water is in the world ocean. Fresh water is found in rivers, lakes, and streams. However, most of the fresh water on the earth is frozen in ice.

The world ocean makes up most of the hydrosphere. But we think of it as three major oceans. They are the Atlantic, Pacific, and Indian Oceans. We also use the names Arctic Ocean and Antarctic Ocean for areas of the Atlantic and Pacific Oceans.

The Pacific Ocean covers the largest area of the world ocean. More than half of the earth's ocean water is in the Pacific. It is also the world's deepest ocean. The Atlantic Ocean is the second largest ocean. The Indian Ocean is the smallest.

The oceans are all connected, but the waters move as if they were several separate bodies. These separate movements are called **ocean currents.** Currents have been called "rivers of water" in the ocean.

You will learn more about ocean currents on the facing page.

OCEAN CURRENTS

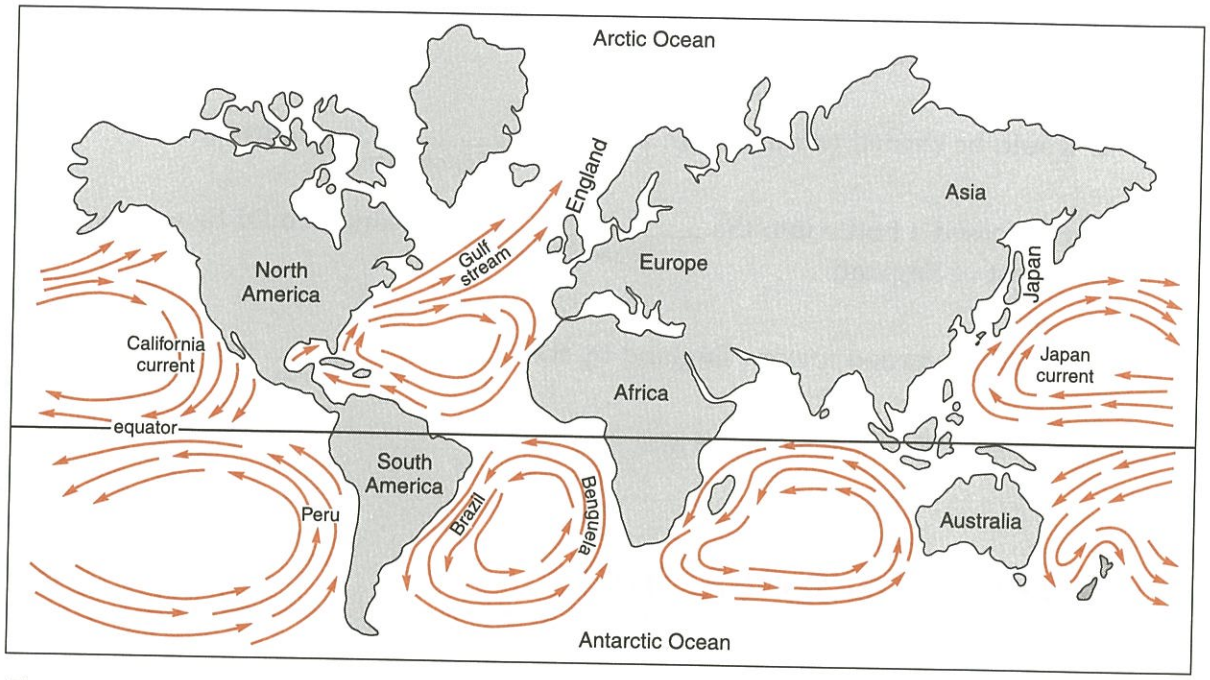


Figure A

Figure A shows the major ocean currents. Notice their circular paths. Each one covers a great distance.

What causes ocean currents?

- Global winds are the chief cause of currents.
- The spinning of the earth causes currents to turn.
- The continents (land) cause currents to turn.

The ocean currents can be warm or cold. Currents that flow from the equator are warm currents. Currents that come from the North Pole and South Pole are cold currents.

Use Figure A to answer these questions.

1. North of the equator, the ocean currents move in a _____ direction.
   clockwise, counterclockwise

2. South of the equator, the ocean currents move in a _____ direction.
   clockwise, counterclockwise

Follow the path of the Gulf Stream.

3. The Gulf Stream starts in the Gulf of Mexico, where the water is _____.
   warm, cold

4. The Gulf Stream flows _____ toward Europe.
   northeast, southwest

5. It flows toward the coast of _____.
   Japan, England

Which current?

6. If you tossed a bottle into the _____ Ocean, it could be washed up on the coast of Japan.
   Pacific, Atlantic

7. It would be carried toward Japan by the _____ current.
   Gulf Stream, Japan

8. If you tossed a bottle into the _____ Ocean, it could be washed up on the coast of England.
   Pacific, Atlantic

9. It would be carried toward England by the _____ current.
   Gulf Stream, California

10. The ocean currents near Brazil are _____.
    warm, cold

OCEAN CURRENTS AFFECT CLIMATE

The oceans and the atmosphere work together in many ways. Air masses pick up water over oceans and bring rain to the land. But ocean currents also affect climate.

For example, the Gulf Stream starts in a warm part of the earth. Gulf Stream water is warmer than the water next to it. Winds that blow over the Gulf Stream pick up some of this warmth and moisture. The warm, moist air blowing over the Gulf Stream brings mild weather with it.

Figure B

London is famous for its "pea soup" fogs. They form when warm Gulf Stream water meets colder water off the English Coast.

OCEAN CURRENTS ALSO AFFECT SEA NAVIGATION

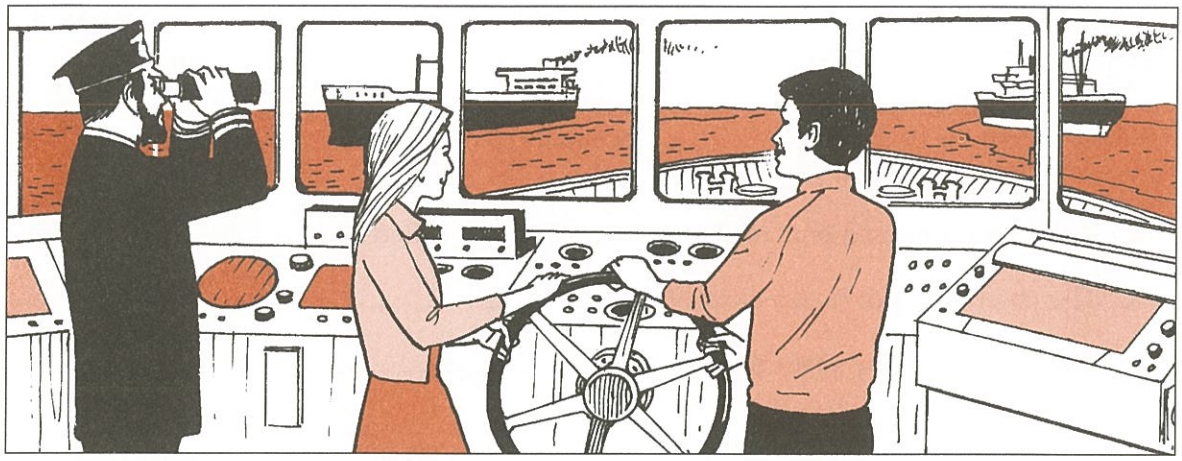


Figure C

Imagine that you are a ship's captain.

1. If you were sailing to England from the United States, you would _____ (seek out, avoid) the Gulf Stream.

2. Why? _____

_____

3. If you were sailing from England to the United States, you would _____ (seek out, avoid) the Gulf Stream.

4. Why? _____

_____

WORD SCRAMBLE

Below are several scrambled words you have used in this Lesson. Unscramble the words and write your answers in the spaces provided.

1. RUCTERN _____
2. SEERPHOHRDY _____
3. TINNONECT _____
4. NOCEA _____
5. PCICFIA _____

FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided.

continent	cold currents	equator
warm currents	ocean currents	global winds
move at an angle	poles	clockwise

1. The general movements of the ocean waters are called _____.
2. The chief cause of ocean currents is the _____.
3. The turning of the earth makes the currents _____.
4. An ocean current turns about when it comes near a _____.
5. In the part of the world you live, the ocean currents move in a _____ direction.
6. Ocean currents are classified as _____ and _____.
7. Warm currents start near the _____.
8. Cold currents start near the _____.

Use Figure D to answer the questions.

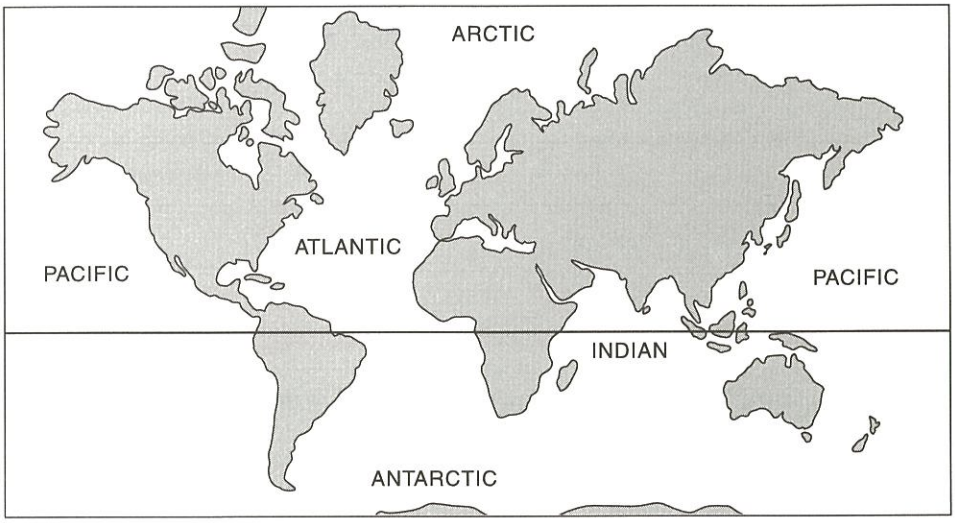


Figure D

Most of the earth's water is part of one huge ocean. But it has been divided into three major oceans.

1. Name the oceans. _____
2. Which is the largest ocean? _____
3. What other names do we use for areas of the Atlantic and Pacific Oceans? _____

_____