

Spheres of Earth



Biosphere (bī' ə sfīr) the part of Earth in which organisms can live

Lithosphere (lith' ə sfīr) the layer of Earth made of the crust and the upper mantle

Hydrosphere (hī' drə sfīr) Earth's large bodies of water, such as the Great Lakes and the oceans

Using SCIENCE Words

1. Dolphins live within Earth's _____.
A. biosphere
B. hydrosphere
C. both A and B

- 1 Earth can be divided into spheres. The part of Earth in which life exists is the **biosphere**. Forests, deserts, and mountains are part of the ecological system called the biosphere. Rivers, lakes, and oceans are also part of the biosphere.
- 2 The **lithosphere** is the rocky outer surface of Earth, which is made of the crust and the top layer of the upper mantle. The upper surface of the lithosphere has many landforms. There are mountains, plains, and valleys. The deepest valleys can be found below sea level along the ocean floor.
- 3 Try to picture the world without water. The dry, dusty surface of Earth would represent a portion of the lithosphere. Add trillions of liters of water, and another layer of Earth is formed, the hydrosphere. The **hydrosphere** contains all the planet's water. Salt water makes up 97 percent of the water on Earth. Freshwater, which makes up the remaining 3 percent, can be found in streams, rivers, groundwater, and glaciers.
- 4 The atmosphere is the layer of gases that surrounds Earth. Earth's atmosphere acts as an insulating blanket that prevents Earth from becoming too hot or too cold. It also acts as a shield against some harmful rays from the sun. Without the atmosphere, life as we know it would not exist on Earth.
- 5 Events that occur in one sphere may affect one sphere or all the spheres. A volcano, for example, begins in the lithosphere; an eruption can cause widespread damage to nearby landforms. Plants and animals in the region may perish because of the flow of lava. As volcanic ash rises into the air, the atmosphere may become polluted. Both lava and volcanic ash can harm bodies of water (hydrosphere) and the organisms that live in the water.
- 6 Energy from the sun has a tremendous effect on Earth's spheres. As energy from the sun reaches the lithosphere, air near the ground is warmed. Because warm air is less dense than cold air, the warm air rises, and cold air moves in to replace the warm air. This movement of air is wind.
- 7 Large bodies of water, such as oceans and lakes, make up Earth's hydrosphere. They respond to the sun's energy differently than land does. This uneven response of the lithosphere and hydrosphere to the sun's energy shapes Earth's weather.
- 8 The surface of Earth warms faster than large bodies of water do, but large bodies of water maintain a constant temperature longer than land does. For this reason, air is warmer over the ocean at night. Cooler air from the land rushes over the ocean to replace the warm, rising ocean air. This movement of air creates a land breeze. During the day, the air is warmer over the land. When the warm, less-dense air over land rises, cooler air from the ocean rushes over the land, causing a sea breeze.
- 9 The hydrosphere has a significant effect on weather. When the sun's rays strike the surface of a large body of water, some of the water turns into water vapor. When this moist air cools, the water in the air is released in the form of rain, snow, or ice. Therefore, large bodies of water affect the weather by supplying much of the water that later falls as precipitation.

COMPREHENSION

Write the letter of the best answer.

2. Which is part of Earth's lithosphere?
 - a. a hill
 - b. a pond
 - c. fog
3. Which is **not** part of the hydrosphere?
 - a. a glacier
 - b. river
 - c. lava
4. Which statement is **not** true?
 - a. Energy from the sun affects Earth's spheres.
 - b. Events that occur in one sphere may affect one sphere or all the spheres.
 - c. The hydrosphere does not have an effect on weather.
5. The _____ prevents Earth from becoming too hot or too cold.
 - a. lithosphere
 - b. atmosphere
 - c. hydrosphere
6. Which statement is true?
 - a. Large bodies of water warm faster than land.
 - b. Land warms faster than ocean water.
 - c. During the day, the air over the land is cooler than the air over the ocean.

LEARN ABOUT WORDS

A. You can often tell the meaning of a word by reading the words around it. Look at each number in parentheses. Find the paragraph in the reading with the same number. Then find the word that fits the given meaning. Write the word.

7. large bodies of salt water (1)
 8. to imagine (3)
 9. includes (3)
 10. huge masses of ice that move (3)
 11. having special importance (9)
- B. The small boat / swayed in the wind.
(Subject) (Predicate)
- The fence / is made of wood.
(Subject) (Predicate)
- Each sentence above has a subject and a predicate. Read the following sentences and the words in **bold type**. If those words are the subject of the sentence, write *S*. If they are the predicate, write *P*.
12. **Prince Jeffrey** is heir to the throne.
 13. Jen **watched six planes land at the airport.**
 14. **Wood** is a natural resource that comes from trees.
 15. Dew **forms on the plants and grass.**
 16. **Carla and I** think it will rain today.

THINK ABOUT IT

When natural events occur, they can cause changes in one or more of the spheres. Below is an article written about a series of weather-related events. Read the article, and answer the question.

Last Tuesday, Spring Town was hit with a severe thunderstorm that lasted six hours. From the safety of their homes, the residents of Spring Town watched as the rain flooded nearby rivers and streams. The flash floods have caused a considerable amount of damage to the local area as mud slides have destroyed much of the terrain and blocked roads in the southern portion of the county. The mud slides did not reach the Scarsdale neighborhood, but they did destroy most of the trees and wildlife in their paths. City council members will be meeting tonight to discuss ways to restore the region and its wildlife.

17. Based on this article, changes occurred in three of Earth's spheres. In which order were the spheres affected?
- A. hydrosphere, lithosphere, atmosphere
 - B. lithosphere, hydrosphere, atmosphere
 - C. atmosphere, lithosphere, hydrosphere
 - D. atmosphere, hydrosphere, lithosphere

Using Science Words

1. C

Comprehension

2. a
3. c
4. c
5. b
6. b

Learn About Words

- A.
7. oceans
 8. picture
 9. contains
 10. glaciers
 11. significant
- B.
12. S
 13. P
 14. S
 15. P
 16. S

Think About It

17. D

Writing About Science

List the spheres of Earth, and write a description of each sphere.