

The Atmosphere • Section Summary

The Air Around You

Guide for Reading

- What is the composition of Earth's atmosphere?
- How is the atmosphere important to living things?

Weather is the condition of Earth's atmosphere at a particular time and place. Earth's **atmosphere** is the envelope of gases that surrounds the planet.

Earth's atmosphere is made up of nitrogen, oxygen, carbon dioxide, water vapor, and many other gases, as well as particles of liquids and solids. Nitrogen makes up about three fourths of the air.

Oxygen is the second most abundant gas in air. Plants and animals take oxygen directly from air and use it to release energy from food. Oxygen also is needed for fire to burn. Most oxygen molecules have two oxygen atoms. A form of oxygen called **ozone**, which contains three oxygen atoms in each molecule instead of the usual two, is sometimes found in air. It forms when lightning interacts with oxygen in the air.

Carbon dioxide is very important because plants need it to survive. Plants and animals give off carbon dioxide as a waste product when they break down food to produce energy. The burning of fuels such as gasoline and coal also produces carbon dioxide.

Water vapor is invisible—it is water in the form of a gas. The amount of water vapor in the air may vary greatly. Water vapor is important in weather. It produces clouds and precipitation.

Pure air contains only gases. In the real world, air also contains tiny solid and liquid particles of dust, smoke, salt, and other chemicals.

Earth's atmosphere makes conditions on Earth suitable for living things. The atmosphere contains oxygen and other gases that living things need. The atmosphere also traps energy from the sun, which keeps Earth's surface warm and Earth's water in liquid form, another requirement of living things. In addition, the atmosphere protects Earth from dangerous radiation from the sun and from meteoroids, which are chunks of rock from outer space.

The Atmosphere • Guided Reading and Study

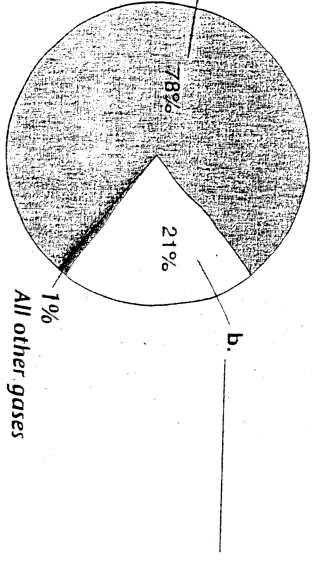
The Air Around You (continued)

Introduction

1. The condition of Earth's atmosphere at a particular time and place is called _____.
2. What is Earth's atmosphere?

Composition of the Atmosphere

3. Label the two larger pieces of the graph with the gases they represent.



- a. Use the graph to estimate how many times more nitrogen than oxygen makes up air. _____
 - b. What percentage of air is made of nitrogen and oxygen together? _____
4. Circle the letter of each sentence that is true about nitrogen.
 - a. Humans do not breathe in nitrogen.
 - b. A nitrogen molecule has two nitrogen atoms.
 - c. Nitrogen is a gas.
 - d. Nitrogen makes up more of the air than any other gas.
 5. Circle the letter of each sentence that is true about oxygen.
 - a. It is needed by animals but not plants.
 - b. It is needed to release energy from food.
 - c. It is released by fuels when they burn.
 - d. It may form ozone when it interacts with lightning.

The Atmosphere • Review and Reinforce

The Air Around You

Understanding Main Ideas

Fill in the blanks in the table below.

Gases in Dry Air	Percent by Volume
Argon	1. <u>0.93</u>
2. <u>Carbon Dioxide</u>	0.038
Nitrogen	3. <u>78</u>
4. <u>Oxygen</u>	21

Answer the following questions on a separate sheet of paper.

5. Besides the gases shown in the table, what else is found in Earth's atmosphere?
6. What are two sources of carbon dioxide in air?
7. What are trace gases?
8. How does the atmosphere make conditions on Earth suitable for living things?
9. What are two processes that use oxygen?
10. Is the atmosphere always the same? Explain why or why not.

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

11. weather _____
12. atmosphere _____
13. ozone _____
14. water vapor _____

- a. the envelope of gases that surrounds Earth
- b. a form of oxygen that has three oxygen atoms in each molecule instead of the usual two
- c. water in the form of a gas
- d. the condition of Earth's atmosphere at a particular time and place