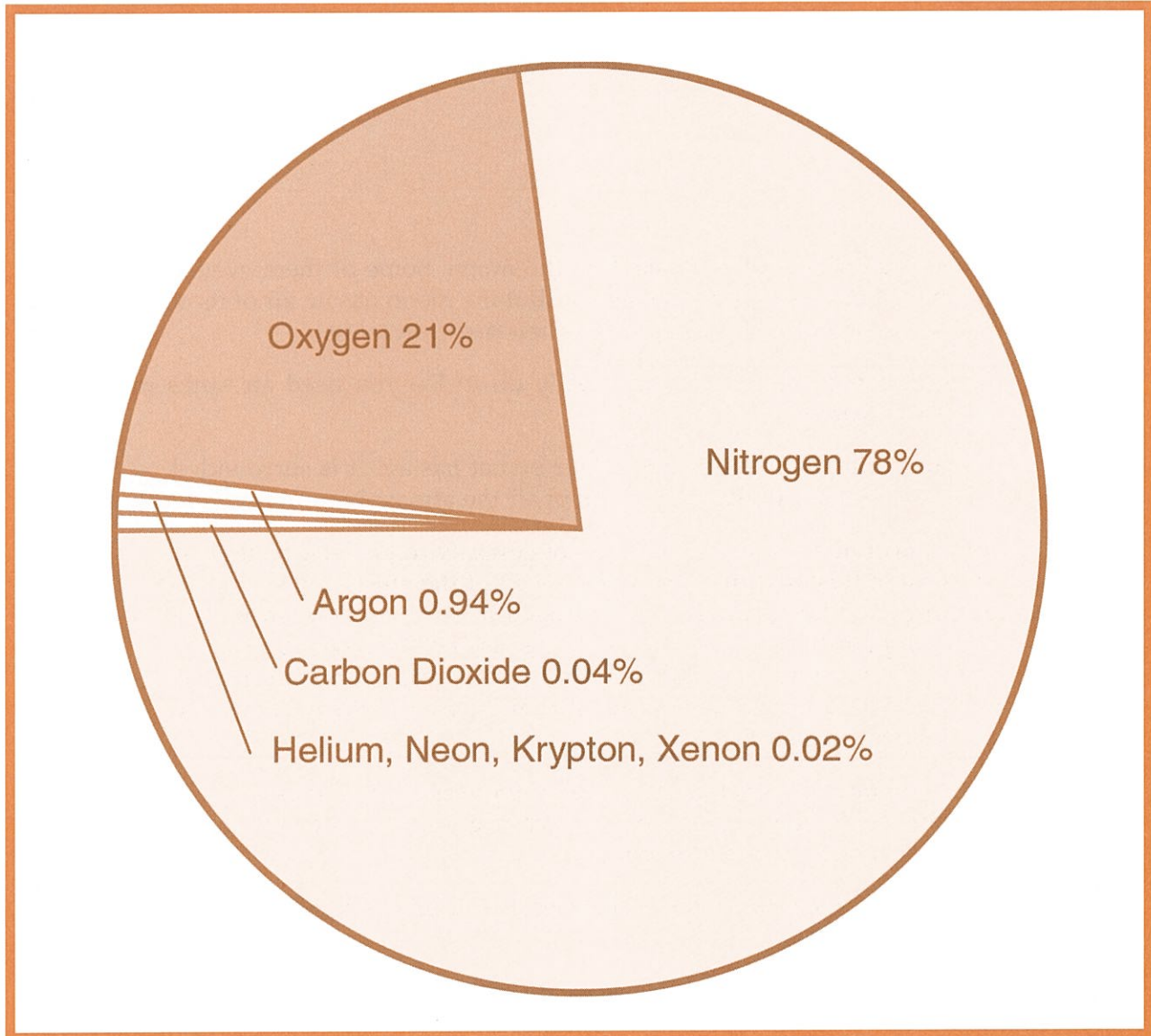


What is air made of?



KEY TERMS

atmosphere: envelope of gases that surrounds the earth

respiration: process by which living things combine food and oxygen to get energy

LESSON | What is air made of?

8

Several Americans have walked on the moon. Some of them even rode among the craters in lunar “buggies.” But the moon has no air of its own. So the astronauts had to take along their own—in tanks.

Take a deep breath. Go ahead—really do it! Do you need air tanks in order to breathe?

Our planet is not like the moon. Our planet has air. It is surrounded by an “ocean” of air. We call this ocean of air the **atmosphere** [AT-mus-feer].

The atmosphere, or air, is a mixture of gases. Nitrogen and oxygen make up most of this mixture. About 78 percent of the atmosphere is made up of nitrogen. Living things need nitrogen to survive. Oxygen makes up about 21 percent of the air. Living things also need oxygen. Do you know why? Living things need oxygen to carry on **respiration** [res-puh-RAY-shun]. Respiration is the process by which living things combine food and oxygen to get energy.

Small amounts of other gases make up the rest of the atmosphere. They are carbon dioxide, water vapor (water in gas form), and certain “rare” gases such as helium and neon.

The atmosphere also contains tiny pieces of solids like pollen, dust, and ash.

COMPLETE THE GRAPH

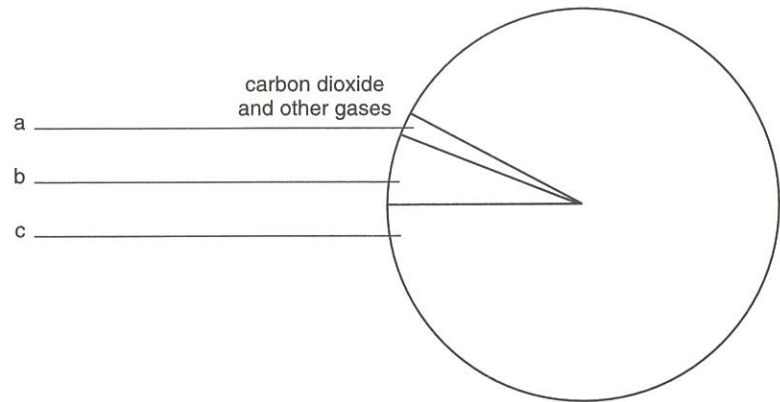


Figure A

The atmosphere is a mixture of gases.

This pie graph shows the percentages of the different gases.

1. About 78 percent of the atmosphere is nitrogen.

Write "NITROGEN-78%" on the proper line of the graph.

2. About 21 percent of the atmosphere is oxygen.

Write "OXYGEN-21%" on the proper line of the graph.

3. Figure this one out.

If the atmosphere has 78 percent nitrogen and 21 percent oxygen . . .

then

what percent is left for carbon dioxide and the other gases? _____ percent

Write this number on the proper line of the graph. Also write what the number stands for.

THE OXYGEN-CARBON DIOXIDE CYCLE

Oxygen and carbon dioxide constantly cycle through the environment. Animals breathe in oxygen for respiration. They give off carbon dioxide as a waste product. Plants use the carbon dioxide to make their own food. Plants give off oxygen.

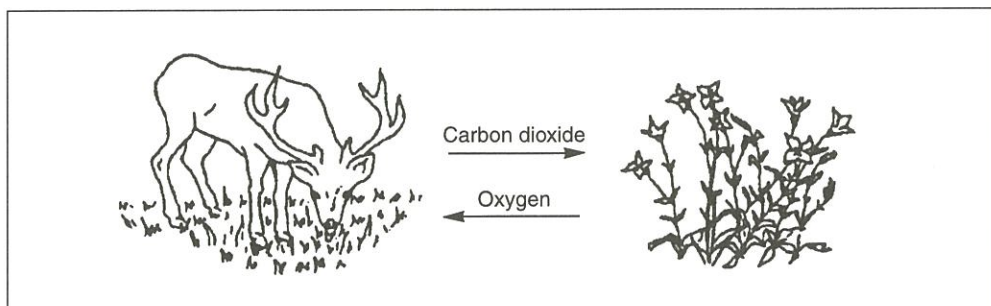


Figure B

THE NITROGEN CYCLE

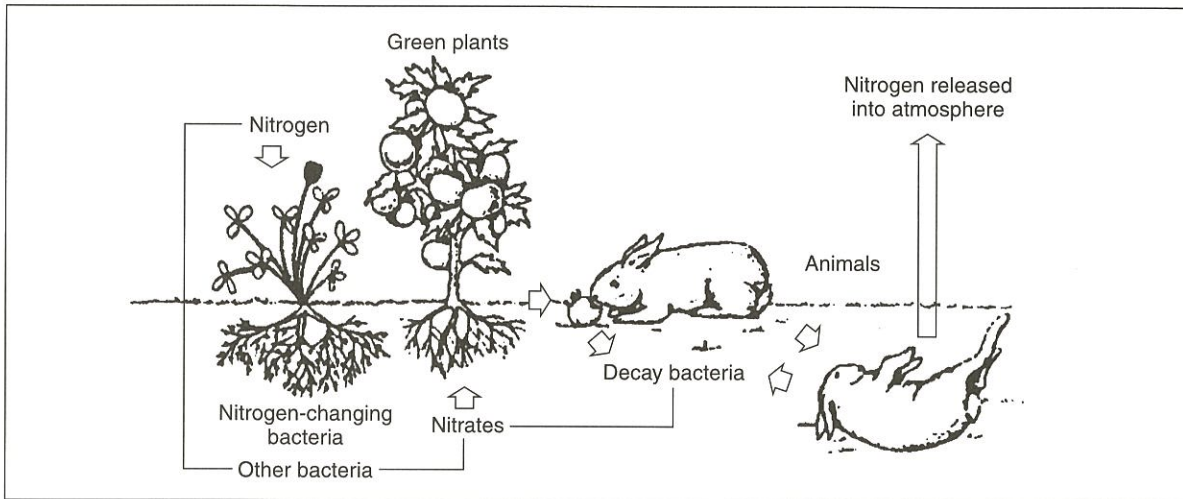


Figure C

Nitrogen makes up about 78% of the atmosphere. However, most living things cannot use nitrogen directly from the air. Bacteria [bak-TEER-ee-uh] are microscopic living things. Some bacteria in the soil change the nitrogen in the air into forms plants can use. Animals get the nitrogen they need by eating plants.

When plants and animals die, other kinds of bacteria break them down. The nitrogen is released back into the atmosphere.

Study Figures B and C to answer the following questions.

1. Animals take in _____ for respiration.
oxygen, carbon dioxide
2. Plants give off _____ when they make their own food.
oxygen, carbon dioxide
3. Nitrogen in the air is changed into forms most living things can use by _____.
soil bacteria, plants
4. Animals get the nitrogen they need by eating _____.
soil bacteria, plants
5. When plants and animals die and are broken down, nitrogen is released back into the _____.
soil, atmosphere

WHERE DOES NATURAL DUST COME FROM?

Natural dust is formed in several ways:

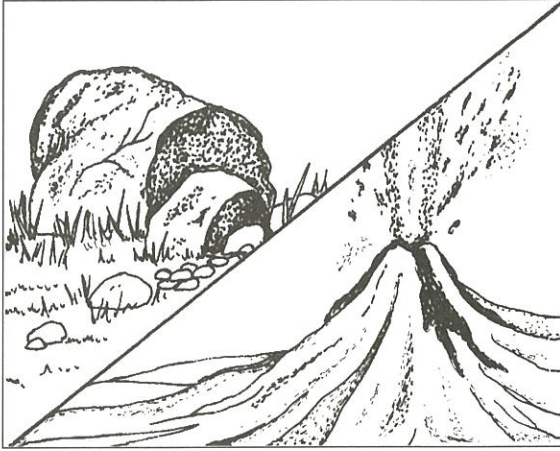


Figure D Dust comes from broken-up rocks.

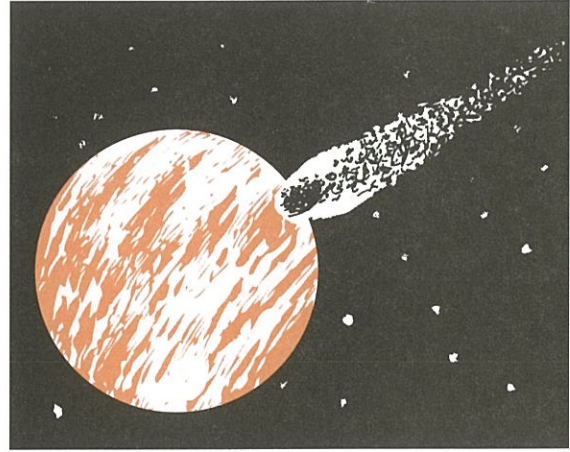


Figure E Dust also comes from space.

Rocks break into smaller pieces. Finally, they become the size of dust (Figure D).

Some dust comes from meteors that burn up in the atmosphere. Much more dust comes from deep outer space (Figure E).

Space dust adds about two million metric tons a year to the earth's weight. That's about 4½ billion pounds!

And here's a surprise. Some household dust is made up of flaked-off skin cells!

FILL IN THE BLANK

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

78%

21%

water vapor

nitrogen

atmosphere

rare

mixture of gases

1. The "ocean" of air that surrounds the earth is called the _____.
2. The atmosphere is made up of a _____.
3. Water in gas form is called _____.
4. Most of the atmosphere is made up of the gas _____.
5. Nitrogen makes up about _____ of the atmosphere.
6. Oxygen makes up about _____ of the atmosphere.
7. Helium and neon are _____ gases.

MATCHING

Match each term in Column A with its description in Column B. Write the correct letter in the space provided.

	Column A	Column B
_____	1. atmosphere	a) needed by all living things
_____	2. water vapor	b) tiny solids in the atmosphere
_____	3. oxygen	c) mixture of gases that surrounds the earth
_____	4. dust, pollen, and smoke particles	d) energy-producing process
_____	5. respiration	e) water in the gas form

TRUE OR FALSE

In the space provided, write "true" if the sentence is true. Write "false" if the sentence is false.

- _____ 1. Carbon dioxide is a "rare" gas.
- _____ 2. The moon has no air of its own.
- _____ 3. Soil bacteria change nitrogen gas into forms plants can use.
- _____ 4. The atmosphere is a mixture of gases.
- _____ 5. Most of the atmosphere is oxygen.
- _____ 6. Oxygen makes up about 21 percent of the atmosphere.
- _____ 7. Only animals need oxygen.
- _____ 8. Water vapor is a gas.
- _____ 9. Some dust is a natural part of the atmosphere.
- _____ 10. Animals take in oxygen for respiration.