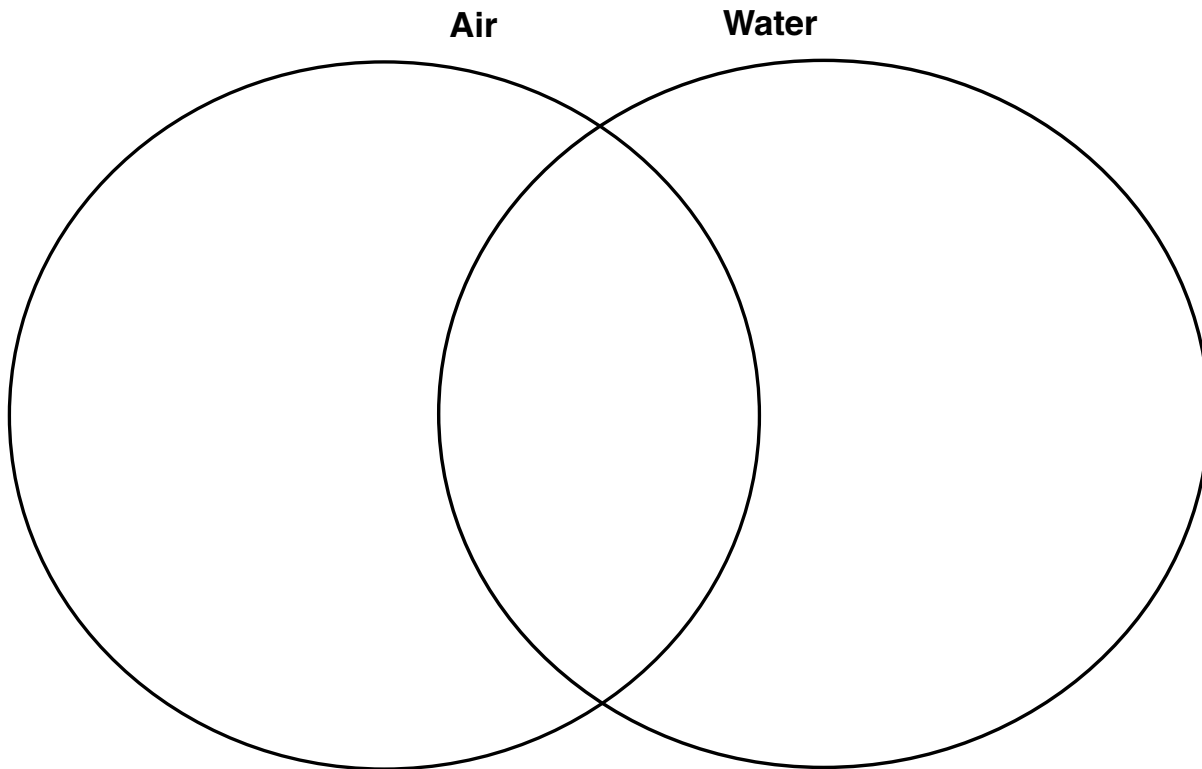


Earth's Weather

You have learned how Earth's water affects life on Earth. Like water, air is necessary for life. Though water is a liquid and air is a gas, both contain life-giving oxygen. Air is similar to water in other ways, too. The particles of air are farther apart than water particles, but they are affected by gravity just as water is. That is why the layer of air closest to the ground is denser and has more pressure than the layers higher in the atmosphere. Just as warm and cold areas in the oceans interact to cause currents that affect temperature and weather, air masses of different temperatures result in strong winds and weather fronts. You could say that air and water are the most important substances on Earth!

Think about the ideas in the passage and the other things you know about air and water. How are air and water alike? How are they different? Record your ideas in the Venn diagram.



Compare and Contrast

When you compare things, you look for similarities. When you contrast things, you identify differences between them. Many things in nature are alike in some ways, but different in others.

Sunrise and sunset are alike because they involve the position of Earth and the Sun and each occurs once a day. But sunset and sunrise are different, too. One occurs at the beginning of the day and brings the Sun into view, and the other occurs at the end of the day as the Sun disappears from view.

Think about each pair of objects or events below. Then write at least one way they're alike and one way they're different.

	Alike	Different
1. Snow and rain		
2. The Moon and the Sun		
3. A lake and an ocean		
4. A flood and a tornado		
5. A drought and a wildfire		

More Alike than Different?

Read the following descriptions of three climate zones in the United States. Complete the chart by marking with X the features that apply to each kind of storm.

In **New England**, winters are cold and snowy. Summers are fairly hot and humid with frequent thunderstorms.

In the **Southwest**, winters are mild and dry and summers are warm and dry. The desert areas are extremely hot.

In the **Midwest**, winters are usually cold and some areas receive heavy rain or snow. Midwestern summers are hot and humid.

	New England	Southwest	Midwest
cold winters			
mild winters			
snow			
dry climate			
warm or hot, humid summers			
rainstorms			
hot, dry summers			

Explain which two of the climate zones are the most alike and why.

Air, Wind, and the Atmosphere

Fill in the blanks.  Reading Skill: **Compare and Contrast** - questions 4, 5, 8, 10, 13, 14

What Is the Atmosphere?

1. Air is a (n) _____ of gases.
2. The water _____ forms clouds that can make rain and snow.
3. The blanket of air surrounding Earth is called the _____.
4. The outer layer of the atmosphere has much _____ air particles than the layer closest to Earth.
5. The _____ is colder than all the other layers of the atmosphere.

What Makes Weather?

6. To describe weather, scientists measure these four properties of air:
 - a. _____,
 - b. _____,
 - c. _____, and
 - d. _____.
7. Humidity is a measurement of how much _____ is in the air.
8. When the weather is humid, the air feels hot and sticky. On cold autumn days, the air is _____.
9. The force on an area from the push of air is called _____.
10. Cool air has _____ air pressure than warm air.
11. Air in motion is called _____.

What Makes the Wind Blow?

12. Wind is caused by uneven _____ of Earth.
13. Dark surfaces absorb _____ heat than light-colored surfaces.
14. Cool air particles are _____ together than warm air particles.
15. Air moves from a place of _____ pressure to one of _____ pressure.
16. When air pressures over a region change, it causes the _____ to change direction.

Why Do Clouds Form?

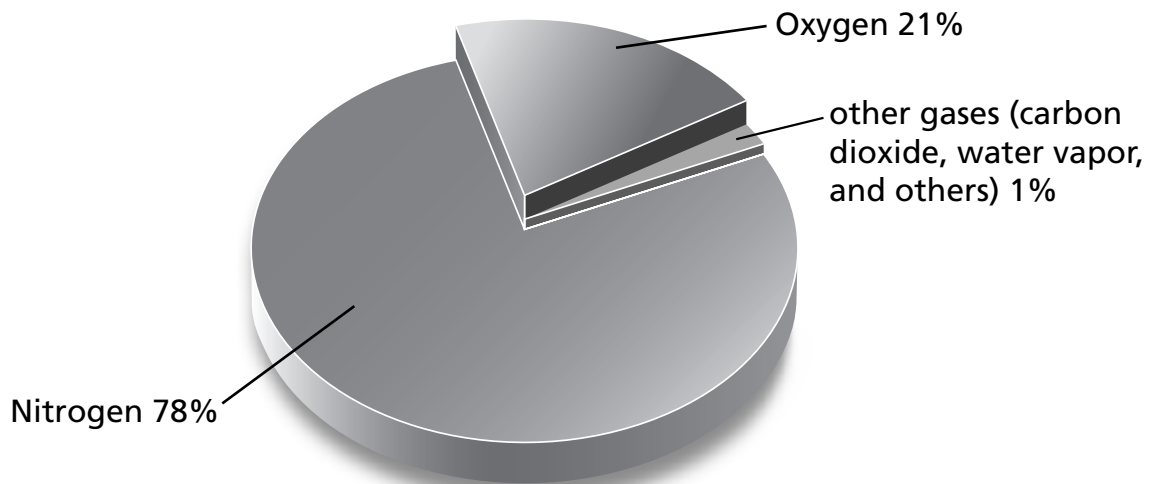
17. When water vapor cools enough, it _____ to form water droplets.
18. Millions of tiny water droplets can join to form _____.
19. Stratus clouds form in _____.
20. _____ clouds are puffy.
21. _____ clouds have wispy shapes, like feathers.

How Can You Describe Weather?

22. A(n) _____ measures air temperature.
23. A(n) _____ measures air pressure.
24. Wind speed is measured by a(n) _____.
25. A(n) _____ shows wind direction.
26. A(n) _____ tells how much rain has fallen.

What Is the Atmosphere?

It is hard to imagine, but every breath you take contains millions of particles. Air is made up of tiny particles of different gases. The mixture does not contain the same amount of each gas. There is more of some gases and less of others. Study the graph to find out more about the gases that make up air.



The Atmosphere

Answer these questions about the pie graph above.

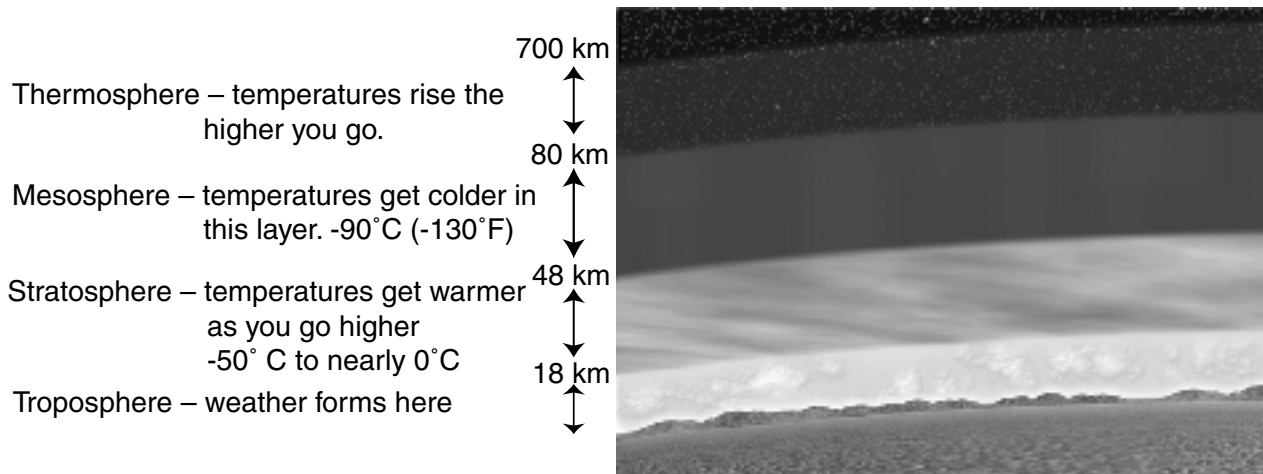
1. What gas is more common than any other in Earth's atmosphere? What part of the air does it make up?

2. What is the second most common gas in Earth's atmosphere? What part of the air does it make up?

3. What gas that is important to plants makes up less than 1/100 of the atmosphere?

Earth's Atmosphere

Earth is wrapped in layers of air particles. The layer of air that is familiar to us is the one closest to Earth. Outside that layer are other layers that are quite different from the one we know. Study the diagram to see how the layers change as they get farther from Earth's surface.



Answer these questions about the diagram above.

1. Which layer of the atmosphere is closest to Earth? _____
2. Which is the coldest layer of the atmosphere? _____
3. Which is the warmest layer of the atmosphere? _____
4. In what layer(s) of the atmosphere does weather form?

5. Why is life found only in the troposphere?

Air, Wind, and the Atmosphere

Fill in the blanks.

1. A puffy cloud that appears to rise from a flat bottom is a(n) _____.
2. A cloud that forms a layer with other flat, clouds is a(n) _____.
3. A wispy, feathery cloud is a _____.
4. When scientists measure how much water vapor is in the air, they are measuring _____.
5. The blanket of air that surrounds Earth is called the _____.
6. The force on an area from the push of air is _____.

Vocabulary

atmosphere
humidity
air pressure
stratus cloud
cumulus cloud
cirrus cloud

Answer each question.

7. Why is air pressure different in the different layers of the atmosphere?

8. Why is there wind on Earth?

Air, Wind, and the Atmosphere

Vocabulary

direction

humidity

wind

troposphere

pressure

atmosphere

temperature

speed

Fill in the blanks.

Living things depend on the gases in Earth's _____. Four air layers surround Earth. Weather forms in the layer closest to Earth's surface, which is called the _____. Scientists describe weather by measuring four things about the air. A thermometer is used to measure the air's _____. A measurement of how much water vapor is in the air is _____. A barometer is used to measure air _____. Air in motion is called _____. An anemometer is used to measure its _____, and a weather vane is used to measure its _____.