

LESSON RESOURCES

- **Workbook**
Practice Exercises, pages 000–000
Xxxx Group Lab, page 000
- **Audio Program**, CD 0, tracks 00–00
- **Assessment Book**, pages 000–000
- **Teacher Resource CD-ROM**
- **Presentation Tool**
PowerPoint Slides, ExamView Pro,
Graphic Organizers, Xxxxxxx, Xxxxxxx

OBJECTIVES

Science • Determine what the atmosphere is. • Identify some kinds of weather that occur in the atmosphere. • Tell why the atmosphere is important to people, plants, and animals. • List the main gases that make up Earth’s atmosphere. • Describe the oxygen-carbon dioxide cycle. • Identify the layers of the atmosphere.

Language • Develop new vocabulary related to the atmosphere and its parts.

- Use newly acquired vocabulary in context.
- Study multiple-meaning words.
- Recognize word origins.
- Study synonyms used in academic vocabulary.
- Write a paragraph describing how Earth’s atmosphere would change if there were no plants.

Skill • Read a pie chart.

NATIONAL SCIENCE
EDUCATION STANDARDS

Unifying Concepts and Processes

Systems, order, and organization; Evidence, models, and explanation; Change, constancy, and measurement; Structure of the Earth system; Energy in the Earth system

Motivate

Blow up a balloon. Ask students what is filling the balloon. (air) **Then ask:** *What is air?* (Answers may include the stuff around us or what we breathe.) *How long could you stay alive without air?* (only a few minutes) Tell students they will be learning more about air in this lesson.

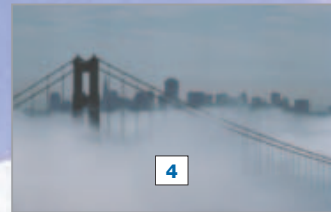
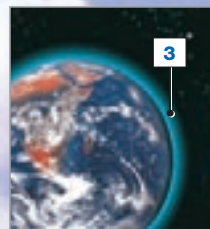
Present the Words

1. Play the audio or read each vocabulary term aloud. Have students say each

The Atmosphere

FOCUS QUESTION
What is the atmosphere made of?

- | | |
|--------------|---------------|
| 1 cloud | 6 water vapor |
| 2 air | 7 gas |
| 3 atmosphere | 8 particles |
| 4 fog | 9 rain |
| 5 pollution | 10 wind |



Word Study

Multiple-Meaning Words

The word **gas** has different meanings.



Cars use **gas**.

Gas is short for **gasoline**.

Gasoline is a liquid, not a **gas**.



Earth’s atmosphere is made of several **gases**.

Oxygen and nitrogen are **gases**.

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For information on solids, liquids, and gases, see pages 162–165.

SCIENCE BACKGROUND

The atmosphere surrounding Earth is a mixture of gases, liquids, and solids. Nitrogen and oxygen make up the majority of the gases in air. Water vapor can make up from zero to four percent of the atmosphere. When the volume of water vapor is high, the percentage of other gases is slightly lower. Carbon dioxide in the air helps hold heat close to Earth. All animals give off carbon dioxide when they breathe. Plants use carbon dioxide to make food. Nitrogen, oxygen, water vapor, and carbon dioxide are all colorless, odorless, tasteless gases. The

most common liquid in the atmosphere is water. Dust and ice are two common solids found in the atmosphere.

The troposphere is the layer of the atmosphere closest to the ground. The troposphere contains 75 percent of all the atmosphere’s gases, as well as liquid water, dust, and ice. Weather, clouds, and pollution, such as smog, occur in this layer.

DIFFERENTIATED INSTRUCTION

NEWCOMER **Making a personal connection** Have pairs of students work together to make drawing of themselves in wind, rain, and fog. Have them label each drawing with the correct vocabulary term.

BEGINNER **Creating flash cards** Ask pairs of students to make flash cards for the vocabulary terms. They can write the term on the front of the card and write a definition in their own words on the back. Then ask the pairs to use the cards to practice the vocabulary terms. One student holds up a card showing the definition and the other

student says the vocabulary term. Then students switch roles.

INTERMEDIATE **Making a KWL chart** Draw a 3-column KWL chart on the board. Label the columns *What I Know*, *What I Want to Know*, and *What I Have Learned*. Have students use the chart to list what they already know about the atmosphere, what they want to know, and what they have learned so far. Have them complete the last column of the chart at the end of the lesson.

term after you as they point to the corresponding picture.

2. Ask students to cover the vocabulary list with a sheet of paper. Call out a number corresponding to a picture and ask students to say aloud the vocabulary term it matches. Focus on clear student pronunciation.
3. Have students work with a partner and continue to quiz each other. Observe the pairs for accuracy and pronunciation.

Word Study

1. Direct students to the Word Study box. Explain that multiple-meaning words are words that are spelled and pronounced the same but have different meanings. Remind them of other multiple-meaning words they may have covered.

2. Draw students’ attention to the two photos. Ask what each photo shows (a gas pump and a flight attendant demonstrating an oxygen mask). Have volunteers read aloud the sentences that go with each picture. Ask students which meaning of the word gas is used in this lesson.

3. Ask students to use both meanings of the words in sentences.

Vocabulary in Context

1. Play the audio or read aloud the first paragraph in the Vocabulary in Context box. Have students define atmosphere.

Then ask: *What are some things we find in the atmosphere?* (rain, fog, clouds, wind, particles, and pollution)
Ask: *Why is Earth’s atmosphere important?* (It makes life possible.)

2. Read the second paragraph aloud. Finally, **ask:** *What is air made of?* (several gases, water vapor, particles, and pollution)

Check Your Understanding

Answers

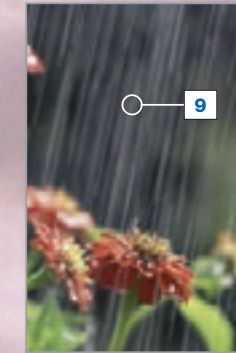
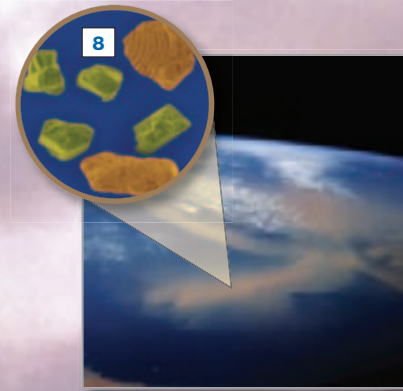
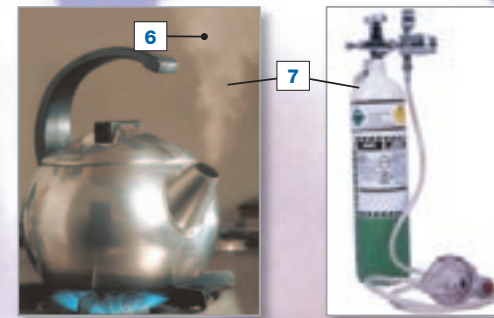
1. Kinds of weather include rainy, windy, cloudy, and foggy.
2. We find rain, fog, clouds, and wind.
3. The atmosphere is made of gases, pollution, water vapor, and particles.
4. Accept all answers that make sense.

Workbook page 145

Vocabulary in Context

The **atmosphere** is the **air** around Earth. We find **rain**, **fog**, **clouds**, and **wind** in the atmosphere. Earth’s atmosphere makes life possible.

Air is made of several **gases**. The atmosphere also contains **pollution**, **water vapor**, and **particles**.



Check Your Understanding

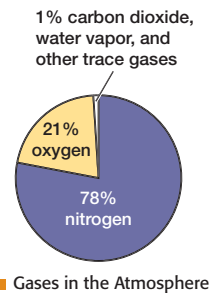
1. Look at the pictures. What kind of weather do you see?
2. What do we find in the atmosphere?
3. What is the atmosphere made of?
4. What causes air pollution? Think about your city or town. Is there much air pollution? Why?

Critical Thinking Applying Information

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Gases in the Atmosphere  CD 0 TR 00

Ask: Did you ever wonder what is in the air you breathe? Then play the audio or read aloud the paragraph. **Ask:** What are some gases in air? (oxygen and nitrogen) What are trace gases? (small amounts of other gases in air)



■ Gases in the Atmosphere


For information on gases, see pages 162–165.

Science Skill: Reading a Pie Chart

1. Read aloud the Science Skill. Draw students' attention to the pie chart. Remind students that the pie chart is cut into several slices. **Ask:** What color is the biggest part of the pie chart? (purple) What gas does this stand for? (nitrogen) How much of the atmosphere is made of this gas? (78 percent)
2. Have students work together in pairs to answer the questions.

Answers

1. The most common gas is nitrogen.
2. Oxygen is 21 percent of the atmosphere.

The Oxygen-Carbon Dioxide Cycle  CD 0 TR 00

1. Play the audio. Then ask a volunteer to read aloud the first paragraph. **Ask:** What gas in air do plants need? (carbon dioxide) What gas do plants put into the air? (oxygen)
2. Play the audio. Then ask another volunteer to read aloud the second paragraph. **Ask:** What gas in air do animals need? (oxygen) What gas do animals put into the air? (carbon dioxide)
3. Draw students' attention to the graphic. **Ask:** What gas do the red arrows represent? (carbon dioxide) What gas do the blue arrows represent? (oxygen)
4. **Ask:** Why do you think this is called the oxygen-carbon dioxide cycle? (because oxygen moves from the plant to the air to the animal, while carbon dioxide moves from the animal to the air to the plant) What part of the cycle are people? (People take in oxygen and give off carbon dioxide.)

Academic Vocabulary

1. Point out that the phrases in bold letters have similar meanings.

Gases in the Atmosphere  CD 3 TR 57

Air is made of several gases. The most common gases are **oxygen** and **nitrogen**. There are small amounts of other gases in Earth's atmosphere. These gases are called **trace gases**.

Science Skill Reading a Pie Chart

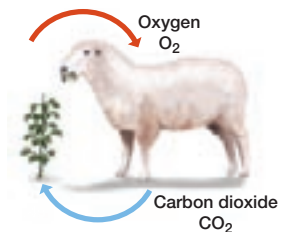
A pie chart shows the parts of something. The pie is cut into several slices. The size of the slice shows the amount. A large slice shows a large amount. A small slice shows a small amount. Look at the pie chart to the left. It shows that the atmosphere is composed of several gases.

1. What is the most common gas?
2. What percent of the atmosphere is oxygen?
3. What is one trace gas?

The Oxygen-Carbon Dioxide Cycle  CD 3 TR 58

Animals and plants need gases to live. Plants need **carbon dioxide**. They get it from the air or the water. Plants make oxygen as waste.

Animals need oxygen. They get it from the air or the water. Animals make carbon dioxide as waste.



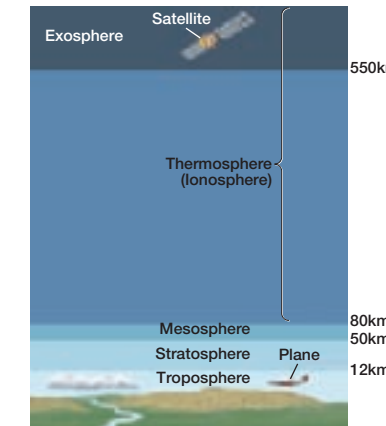
■ The Oxygen-Carbon Dioxide Cycle

Academic Vocabulary

The atmosphere **is made** of several gases.
The atmosphere **is composed** of several gases.
The atmosphere **consists** of several gases.

Layers of the Atmosphere  CD 3 TR 59

The atmosphere consists of several **layers**. The **troposphere** is closest to Earth. The troposphere is warm. The other layers of the atmosphere are very cold and the air is thin. Plants and animals can only live in the troposphere. Satellites fly in the **exosphere**. We often call the exosphere "space."



■ Layers of the Atmosphere

Word Study

Word Origins

Atmosphere is from two Greek words.

- **Atmos** means "gases."
- **Sphere** means "round" or "a ball."

The **atmosphere** is the layer of gases around Earth.

Check Your Understanding

1. What are the two most common gases in the atmosphere? Which one is more common?
 2. What gas do people need? What gas do plants need?
 3. Describe the troposphere. Describe the exosphere.
- Critical Thinking Making Inferences**
4. Can people live in the stratosphere? Why or why not?

Research and Inquiry Use the internet, the library, or your science book to answer these questions.

1. What are the effects of pollution on the atmosphere?
2. What will happen if the carbon dioxide in the atmosphere increases?
3. Who discovered oxygen? How did he discover it?

Writing Imagine that there are no plants on Earth. Explain what would happen. Write a paragraph.

plants and animals live? (in the troposphere) In which layer are satellites? (the exosphere)

Word Study

1. Explain to students that many words in English come from other languages and cultures. Read the information in the Word Study box aloud. Then ask students to make their own definition of atmosphere using the meanings of the two parts of the word.
2. Ask students if they know any words from their native language that are used in English.

Check Your Understanding

Answers

1. Oxygen and nitrogen; nitrogen
2. People need oxygen. Plants need carbon dioxide.
3. The troposphere is closest to Earth. It is warm. Plants and animals live there. The exosphere is farthest from Earth. It is cold. Satellites fly there.
4. No, people can't live in the stratosphere. The air is cold and thin there.

Research and Inquiry

Answers

1. Pollution puts particles and dangerous gases in the air. These gases are bad for plants and animals.
2. If the amount of carbon dioxide in the atmosphere goes up, temperatures on Earth will rise. Ice at the north and south poles will melt, and there will be flooding. There will also be more hurricanes and typhoons.
3. Joseph Priestley discovered oxygen. He discovered it by putting a pure gas in a bottle. Then he put a candle in the bottle. The candle burned very brightly. He concluded that this gas was oxygen.

Writing

Answer Answers will vary, but should include the following ideas: The amount of carbon dioxide would go up. Soon all the animals would use up the oxygen. Without oxygen from plants, people and animals would soon die.

DIFFERENTIATED INSTRUCTION

NEWCOMER Identifying parts of a cycle

Show small groups of students magazine pictures of various plants and animals. For each picture, **ask:** What gas does this living thing need? (All animals need oxygen. All plants need carbon dioxide.) What gas does it make as waste? (All animals give off carbon dioxide. All plants give off oxygen.)

BEGINNER Writing a paragraph

Ask students to write a paragraph describing at least four things they have learned about the atmosphere. Then have pairs read their paragraphs to each other and discuss them.

INTERMEDIATE Making a diorama

Explain to students that a diorama is a three-dimensional scene viewed through window-like opening in a box. Have small groups work together to create a diorama in a shoebox, showing the layers of the atmosphere in proportion to each other. Have them label each layer. Encourage creative use of classroom materials.