






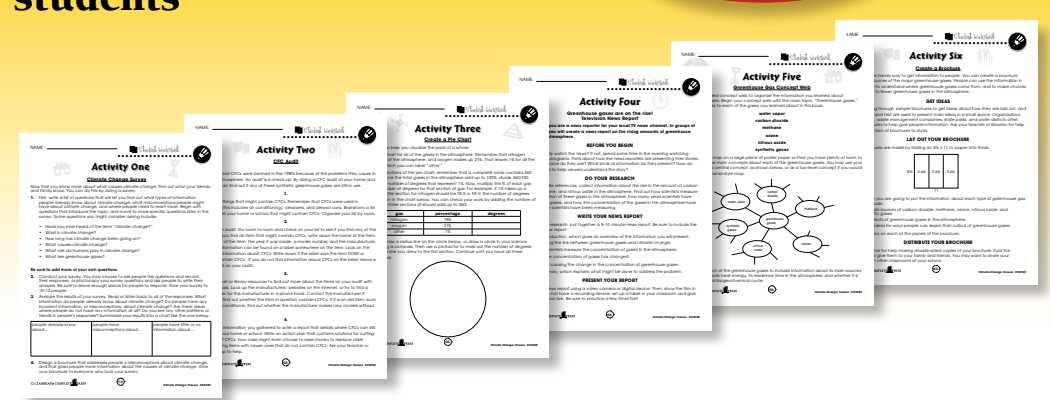
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Earth's Atmosphere

1. Complete each sentence with a word from the list. Use a dictionary to help you.

atmosphere	matter	surrounds	particle
reflects	range	concentration	gaseous

- A surface that _____ light and bends the light back.
- A _____ is the smallest piece that has the features of its material.
- A material that is taking the form of a gas is called _____.
- The _____ is the thin layer of gas that surrounds Earth.
- _____ is the amount of material in a given space.
- _____ is anything that has mass and takes up space.
- The set of values between two limits is a _____.
- Something that _____ a thing goes all the way around its surface.

2. Briefly explain the difference between a solid, a liquid, and a gas.



Earth's Atmosphere

You breathe air all the time in order to stay alive. Have you ever thought about what is in the air, or where it comes from? The thin layer of air that surrounds Earth is called the **atmosphere**. Life on Earth depends on the atmosphere.



The atmosphere contains matter that plants and animals need. In the atmosphere, matter is in the gaseous state. You may remember that matter can take the form of solid, liquid, or gas. In a **gas**, the particles of matter are spread far apart. Gases do not have a definite shape. The particles in a gas can spread out to fill an area.

What is the atmosphere?



What types of gases are in the atmosphere?

Most of the atmosphere is made up of nitrogen (78%) and oxygen (21%). The oxygen comes from plants. They take in carbon dioxide and give off oxygen. The amounts of nitrogen and oxygen in the atmosphere do not change much over time. The atmosphere contains many other gases in small amounts. These gases include water vapor, carbon dioxide, methane, and ozone, among others. The amounts of most of these gases can change from place to place. They can also change over time.



Earth's Atmosphere

1. Use the words in the box to answer each question.

ozone layer	gas	radiation	troposphere
-------------	-----	-----------	-------------

- -
 -
 -
- Which layer of the atmosphere has the most gases?
 - What form of energy can move across empty space?
 - What part of the stratosphere reflects some of the Sun's harmful rays?
 - In which state of matter are particles spread far apart?

2. Put a check mark (✓) next to the answer that is most correct.

a) Which gas makes up 78% of the atmosphere?

- A oxygen
 B nitrogen
 C water vapor
 D carbon dioxide

b) In which part of the atmosphere does weather take place?

- A the troposphere.
 B the stratosphere.
 C the ozone layer.
 D the equatorial layer.

c) What happens to matter when it absorbs radiation?

- A It heats up.
 B It stops moving.
 C It changes into a solid.
 D It rises higher in the atmosphere.



Earth's Atmosphere

3. Answer each question with a complete sentence.

- a) Describe **two** ways in which life on Earth depends on the atmosphere.

- b) How would Earth be different if our planet did not have an atmosphere?

Research

4. What are some of the features of the layers of Earth's atmosphere?

Use the library or Internet resources to find out more about the layers of Earth's atmosphere. Find out the names of all the layers, and their heights above Earth's surface. Look for the answers to one or more of the following questions:

- How does the temperature change in each layer?
- How does the makeup of the gases change in each layer?
- What are auroras, and why do they occur?
- Where do meteors occur, and why do they cause a streak in the sky?

Create a poster with a large diagram showing the layers of the atmosphere, with their heights above Earth's surface. Use the diagram on page 9 for a model. Fill in your poster with information you learned about each layer.



How does an object's color affect how much radiation the object absorbs?

You will need:

- 4 thermometers
- 4 shoe boxes (or boxes of similar size)
- White, yellow, green, and black construction paper

This activity must be done on a sunny day.

Different places on Earth reflect and absorb different amounts of the Sun's radiation. Some things, like thick clouds and ice, reflect a lot of radiation. Other things, like asphalt and soil, absorb a lot of radiation. The color of a place plays a big role in telling how much radiation the thing will absorb.

Cover four different shoe boxes with different color paper: white, yellow, green, and black. Place a thermometer inside each shoe box. Write down the temperature reading of each in the chart below. Then, place all of the shoe boxes in a sunny location for a few hours. While the sun is still on the boxes, take each thermometer out and immediately write down the new temperature reading in the chart below. Which box had the highest temperature? Which box had the lowest temperature? Based on your data, draw some conclusions. How does color affect the amount of radiation that an object absorbs?

Box Color	Starting Temperature	New Temperature
White		
Yellow		
Green		
Black		



Crossword Puzzle!

WORD LIST

- albedo
- atmosphere
- carbon dioxide
- cycle
- energy
- evaporate
- fertilizer
- gas
- global warming
- greenhouse
- heat
- hydrogen
- methane
- nitrogen
- oxygen
- ozone
- synthetic

Across

- The thin layer of air that surrounds Earth.
- Temperature is a measure of this.
- _____ gases absorb radiation from Earth's surface.
- A series of events that happen over and over again.
- Radiation is a form of this.
- The rise in the average temperature at Earth's surface (two words).
- The second most common gas in the atmosphere.
- A substance that helps plants grow.

Down

- A greenhouse gas released by termites.
- Effect caused by reflection of Sun's radiation.
- A main ingredient in smog.
- One of the elements in both methane and water.
- Liquid water changes to gas.
- A substance made only by humans.
- A gas released by burning fossil fuels (two words).
- The most common gas in the atmosphere.
- State of matter that has no definite shape or volume.



Comprehension Quiz

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Part A

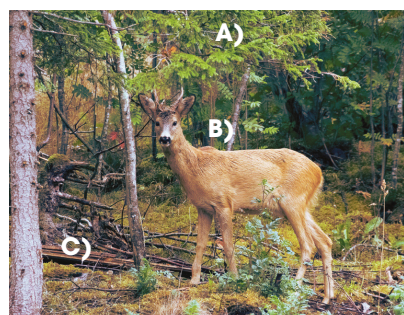
Circle the word **TRUE** if the statement is TRUE or **Circle** the word **FALSE** if it is FALSE.

- Nitrogen and oxygen are the most common gases in the atmosphere.
TRUE **FALSE**
- In a gas, the particles of matter are close together.
TRUE **FALSE**
- Without the atmosphere, the average temperatures on Earth's surface would be much colder.
TRUE **FALSE**
- Heat energy travels from the Sun to the Earth in the form of radiation.
TRUE **FALSE**
- The kind of change that brings back balance in a system is called positive feedback.
TRUE **FALSE**
- Fossil fuels are formed from the remains of plant and animals that lived millions of years ago.
TRUE **FALSE**
- Residence time describes the amount of time it takes to complete a biogeochemical cycle.
TRUE **FALSE**
- Farms are a source of the greenhouse gas methane.
TRUE **FALSE**

Part B

Label the diagram by doing the following:

- Label the diagram to show some of the processes in the **carbon cycle**.
1 decay _____
2 photosynthesis _____
3 respiration _____
- What is the main human source of carbon dioxide in the atmosphere?



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Earth



"The atmosphere is the glowing blue ring around Earth, and the white areas of Earth are clouds and ice caps that reflect the most radiation from the Sun."

NAME: _____

After You Read 



Earth's Atmosphere

3. Answer each question with a complete sentence.

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Research

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3.

a) The atmosphere has matter that living things need and it keeps temperatures in a range that supports life.

b) Answers will vary. Possible answer includes: Earth would be much colder.

Across:

- 2. atmosphere
- 5. heat
- 6. greenhouse
- 9. cycle
- 10. energy
- 11. global warming
- 13. oxygen
- 15. fertilizer

Down:

- 1. methane
- 2. albedo
- 3. ozone
- 4. hydrogen
- 7. evaporate
- 8. synthetic
- 9. carbon dioxide
- 12. nitrogen
- 14. gas



EASY MARKING ANSWER KEY

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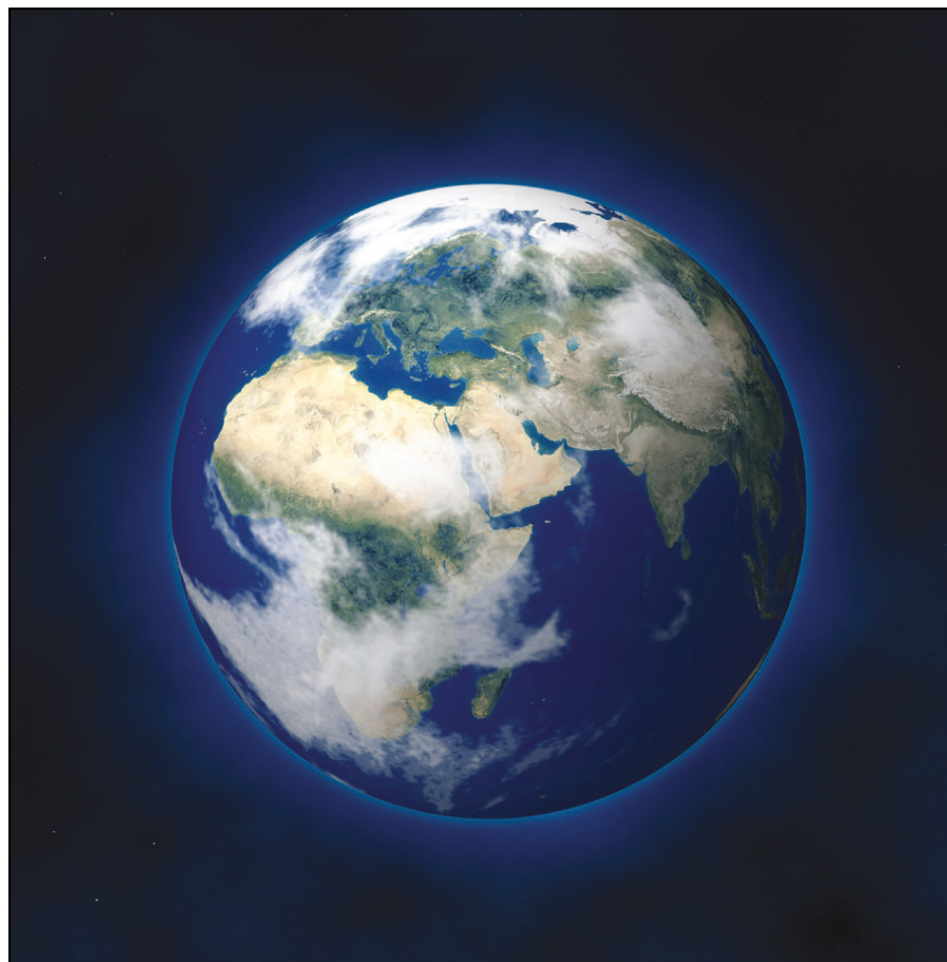
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Earth



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