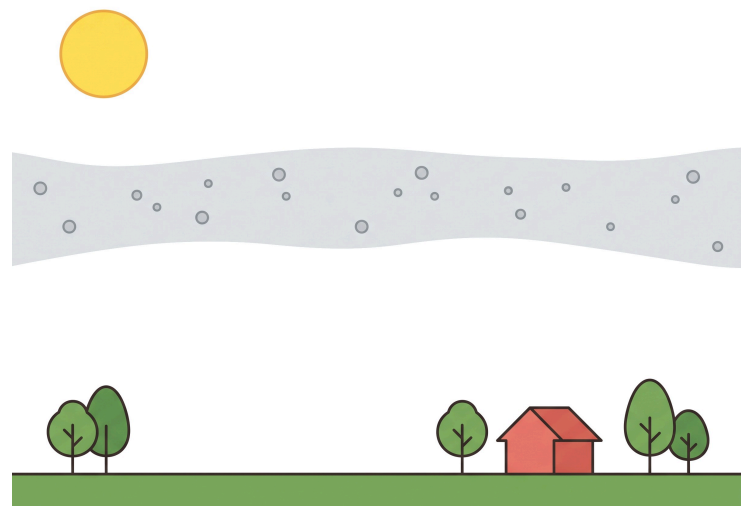
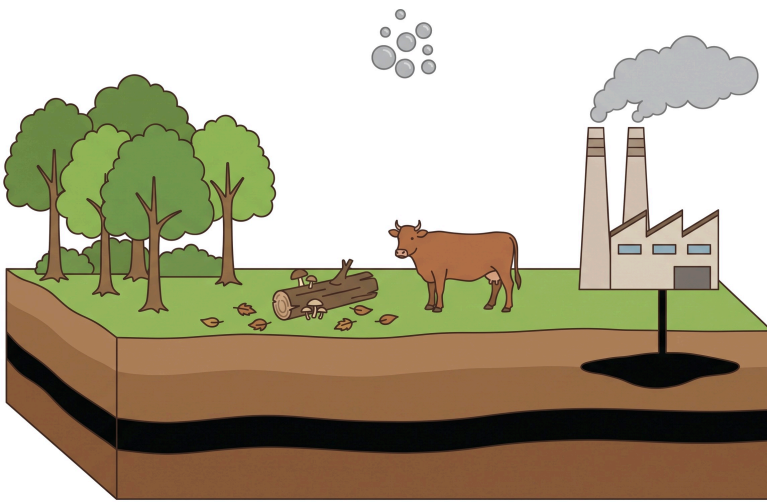


Carbon Cycle and Greenhouse Effect

How carbon moves and how the atmosphere holds heat



9

printable sheets

20

pages

All

answer keys included

Carbon Cycle and Greenhouse Effect Teaching Pack

How carbon moves and how the atmosphere holds heat

How to use this pack. The sheets are in a suggested teaching order: show the labeled diagrams, have students label the blank ones, then work through the practice sheets and finish with the quiz. Use them all over a week or pick the ones you need. The answer keys are together at the back.

What is inside

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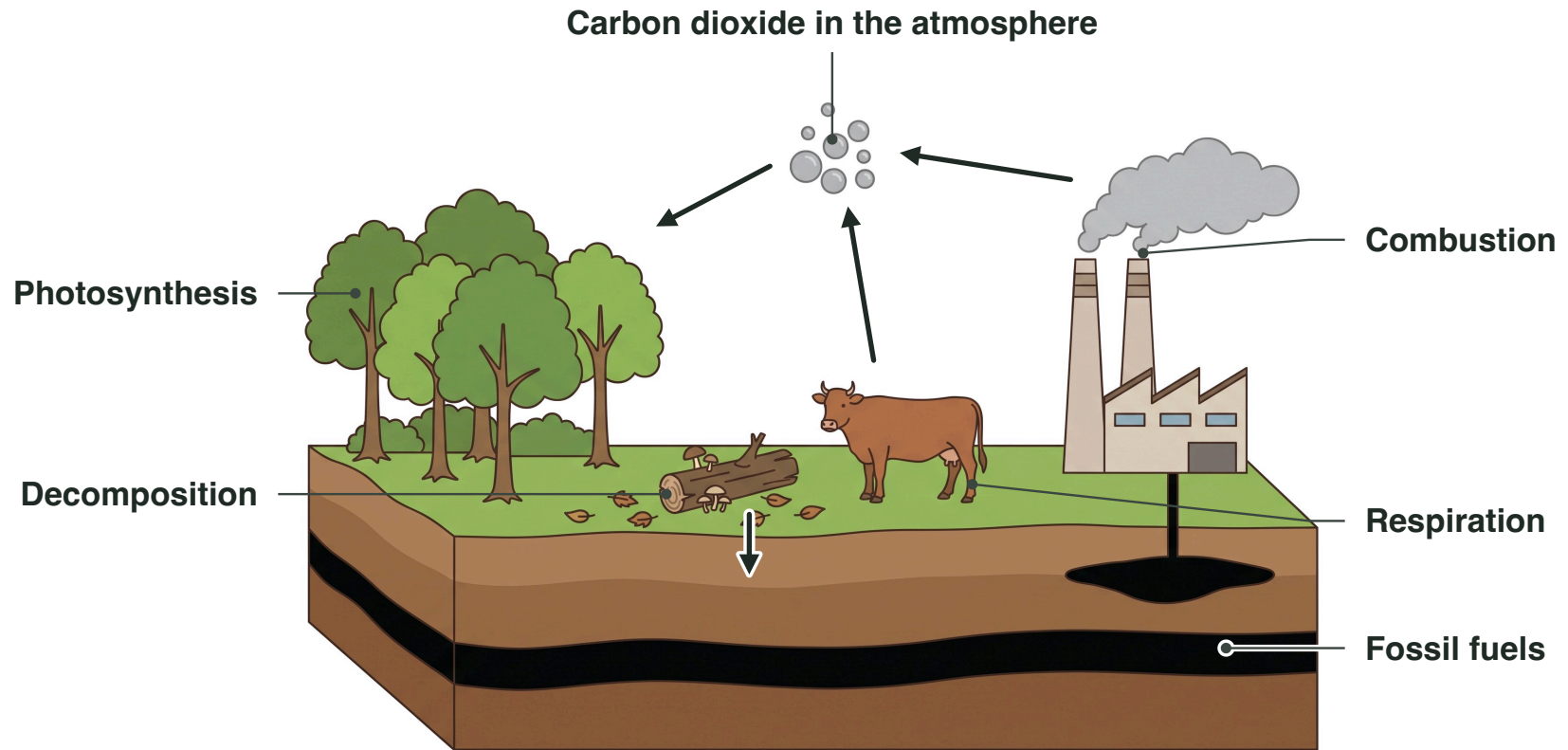
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Answer keys

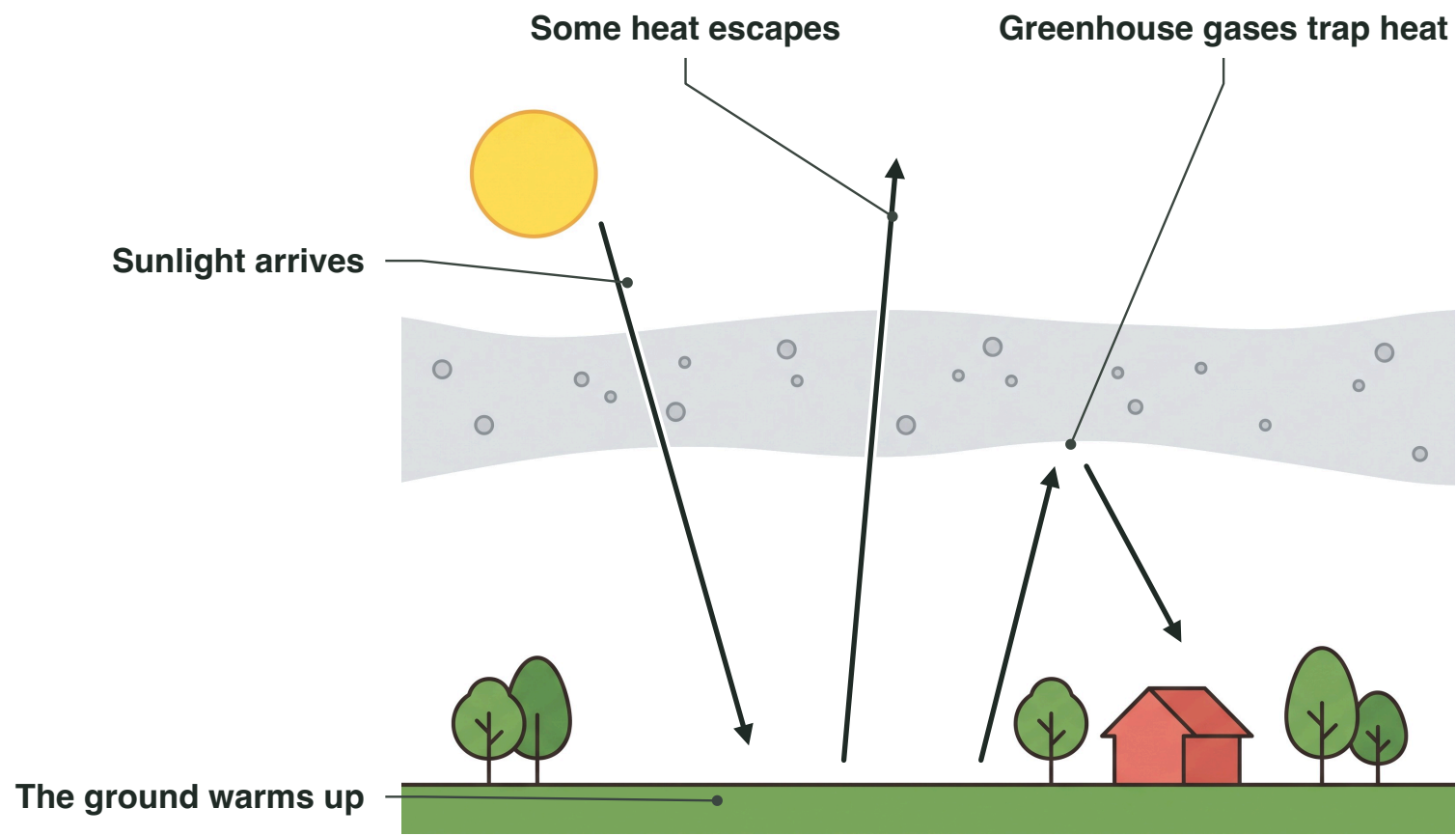
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More free teaching packs. Food Chains and Food Webs, The Water Cycle, The Nitrogen Cycle and more at printablescholar.com/teaching-packs/

The Carbon Cycle



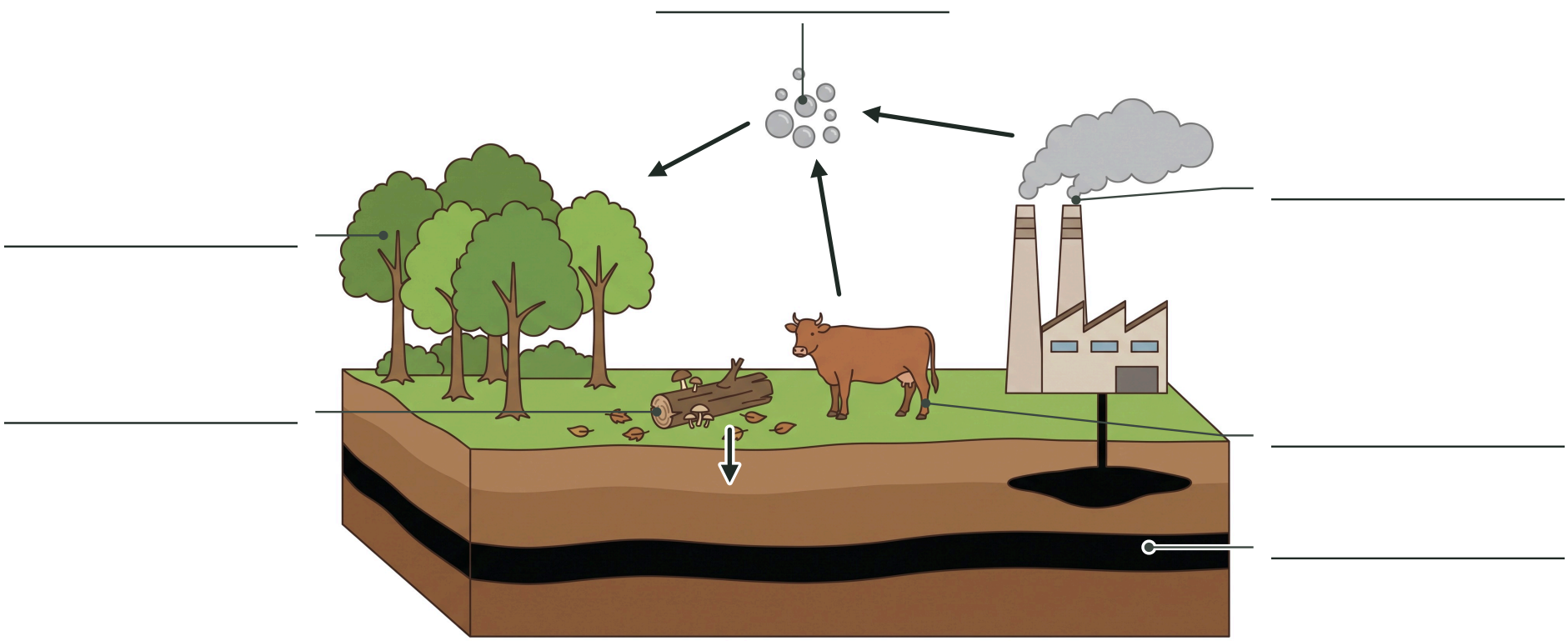
The Greenhouse Effect



The Carbon Cycle

Name: _____

Write the name of each part on its line. Use the word bank.



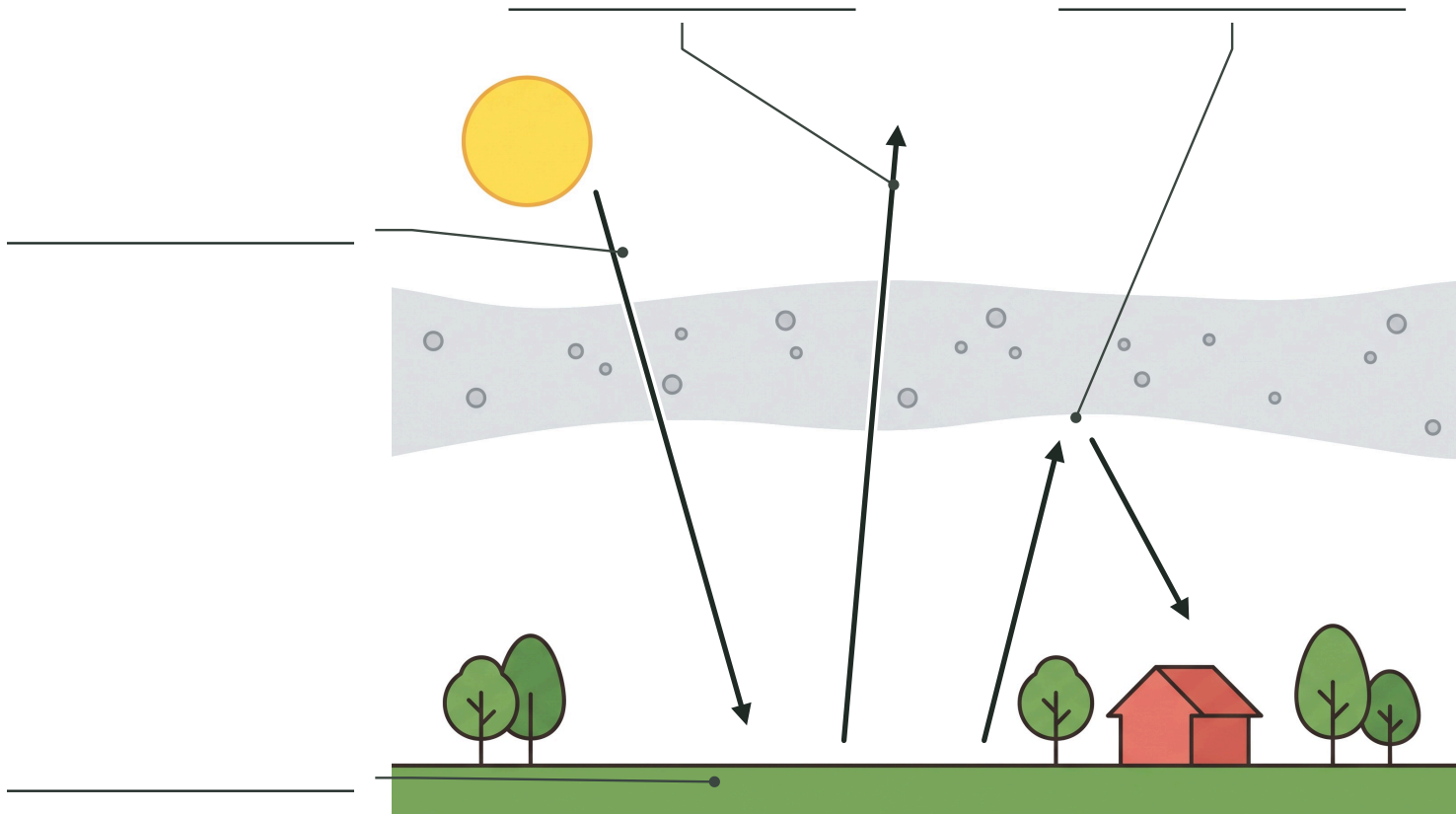
Word bank

- Carbon dioxide in the atmosphere Combustion Decomposition Fossil fuels Photosynthesis
Respiration

The Greenhouse Effect

Name: _____

Write the name of each part on its line. Use the word bank.



Word bank

Greenhouse gases trap heat

Some heat escapes

Sunlight arrives

The ground warms up

The Carbon Cycle: Key Terms

Use the labeled carbon cycle diagram to help you.

Part A. Write the term that fits each description.

Word bank

Carbon

Carbon dioxide in the atmosphere

Combustion

Decomposers

Decomposition

Fossil fuels

Greenhouse gas

Photosynthesis

Respiration

1. Burning. It quickly releases the carbon stored in a fuel. _____
2. Plants use sunlight to make sugar from water and a gas they take from the air. _____
3. Coal, oil and natural gas, formed underground over millions of years. _____
4. The process in which dead plants and animals break down. _____
5. The gas in the air that plants take in and animals breathe out. _____
6. Living things, such as fungi and bacteria, that break down dead matter. _____
7. Living things break down food for energy and give off carbon dioxide. _____
8. The element found in every living thing, and in coal and oil. _____
9. Any gas in the air that absorbs heat given off by the ground. _____

Part B. Answer the questions.

1. Which process on the diagram takes carbon dioxide out of the air?

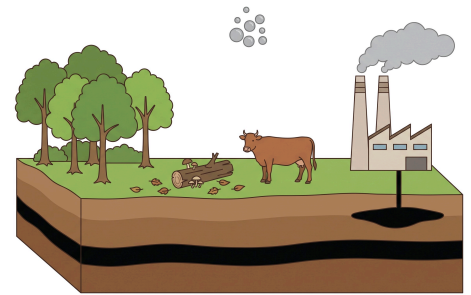
2. Name three processes that put carbon dioxide into the air.

3. The carbon in coal was once in the air. Explain how it got underground.

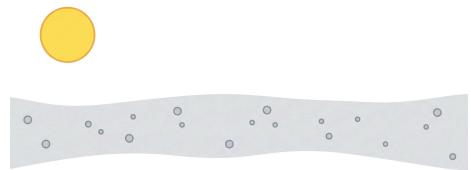
Carbon on the Move

Read the text. Then answer the questions on the next page.

- ① Carbon is an element found in every living thing. It is in your body, in the wood of a tree and in the food you eat. It is also in the air, as part of a gas called **carbon dioxide**. Carbon does not stay in one place. It moves between the air, living things and the ground. This movement is called the **carbon cycle**.
- ② Plants take carbon out of the air. In **photosynthesis**, a plant uses energy from sunlight to turn carbon dioxide and water into sugar. The carbon becomes part of the plant. When an animal eats the plant, some of that carbon becomes part of the animal.
- ③ Carbon returns to the air in several ways. In **respiration**, plants and animals break down food for energy and give off carbon dioxide. In **decomposition**, fungi and bacteria break down dead plants and animals. Some of the carbon goes into the soil and some goes into the air. Another way is burning, or **combustion**. Coal, oil and natural gas are **fossil fuels**. They formed over millions of years from the buried remains of living things. Burning them releases their stored carbon as carbon dioxide.
- ④ Carbon dioxide also helps keep Earth warm. Sunlight passes through the atmosphere and warms the ground. The warm ground gives off heat. Some of that heat escapes into space. But gases such as carbon dioxide, methane and water vapor absorb some of the heat and send part of it back down. They are called **greenhouse gases**, and this warming is the **greenhouse effect**. It is natural. Without it, Earth would be too cold for most living things.
- ⑤ People burn fossil fuels to run cars, heat buildings and make electricity. This adds extra carbon dioxide to the air. Measurements show that the amount of carbon dioxide in the air has been rising for many years. With more carbon dioxide in the air, more heat is trapped.



Carbon moves between the air, living things and the ground.



Gases in the atmosphere hold in some of Earth's heat.

Carbon on the Move: Questions

Go back to the text to find each answer. The paragraphs are numbered to help you.

1. What is this text mostly about?

- ☐ How plants make their food
- ☐ How carbon moves and how carbon dioxide helps keep Earth warm
- ☐ How coal and oil are taken out of the ground
- ☐ Why Earth is too cold for living things

2. Which process takes carbon dioxide out of the air?

- ☐ Respiration
- ☐ Decomposition
- ☐ Photosynthesis
- ☐ Combustion

3. Name two ways carbon returns to the air.

4. What did fossil fuels form from?

- ☐ Carbon dioxide that froze underground
- ☐ Heat given off by the ground
- ☐ Water vapor in the atmosphere
- ☐ The buried remains of living things

5. Number the steps 1, 2 and 3 to show how the greenhouse effect works (paragraph 4).

- ☐ The warm ground gives off heat.
- ☐ Greenhouse gases absorb some of the heat.
- ☐ Sunlight warms the ground.

6. What would Earth be like without the greenhouse effect?

- ☐ Too cold for most living things
- ☐ Too hot for most living things
- ☐ Dark for most of the day
- ☐ The same as it is now

7. Name two greenhouse gases.

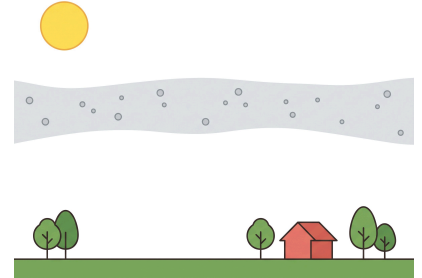
8. How does burning fossil fuels change the amount of heat that is trapped?

How the Greenhouse Effect Works

These steps follow energy from the Sun after it reaches Earth. They are mixed up. Put them in order.

Part A. Number the steps from 1 to 6.

- ☐ Sunlight passes through the atmosphere and reaches the ground.
- ☐ The warm ground gives off heat, which travels up into the atmosphere.
- ☐ Greenhouse gases in the atmosphere absorb some of that heat.
- ☐ The ground absorbs the sunlight and warms up.
- ☐ The ground and the air near it stay warmer than they would without these gases.
- ☐ The gases send part of the heat they absorbed back down toward the ground.



Part B. Answer the questions.

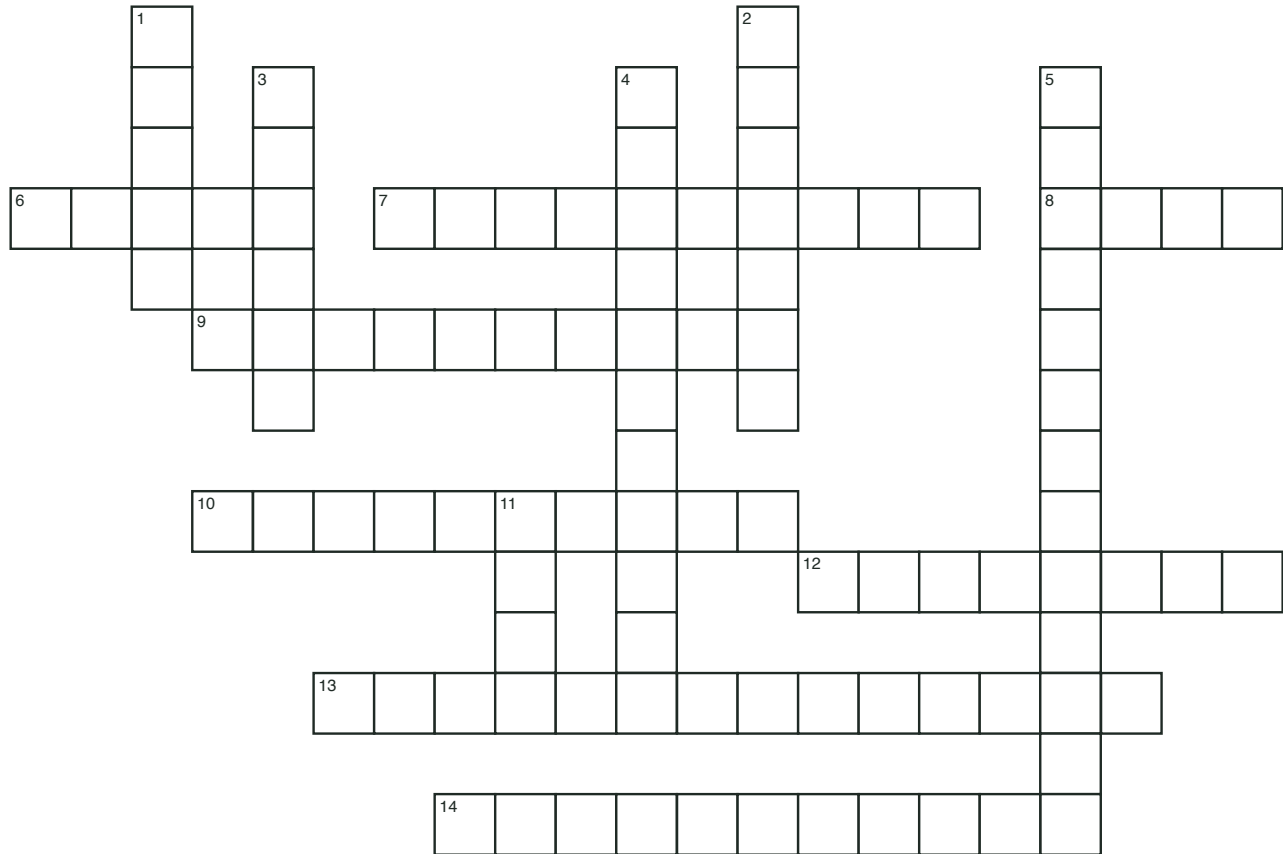
1. Greenhouse gases do not absorb all of the heat from the ground. What happens to the rest?

2. The greenhouse effect is natural. Why do living things need it?

3. Burning fossil fuels adds carbon dioxide to the air. What does that do to the amount of heat that is trapped? Explain.

Carbon Cycle Crossword

Read each clue. Write the answer in the puzzle, one letter in each box. Use the word bank if you get stuck.



ACROSS

6. The food a plant makes from carbon dioxide and water.
7. The layer of gases around Earth.
8. A black, solid fuel that formed underground over millions of years.
9. Another word for burning.
10. A ____ gas absorbs heat given off by the ground.
12. It shines on Earth by day and warms the ground.
13. Plants use energy from the Sun to make sugar from carbon dioxide and water.
14. Living things break down food for energy and give off carbon dioxide.

DOWN

1. Mushrooms belong to this group. They help break down dead plants.
2. Like carbon dioxide and water vapor, this gas absorbs heat.
3. The element found in every living thing.
4. Coal, oil and natural gas (2 words).
5. The breaking down of dead plants and animals.
11. The warm ground gives this off. Some of it escapes into space.

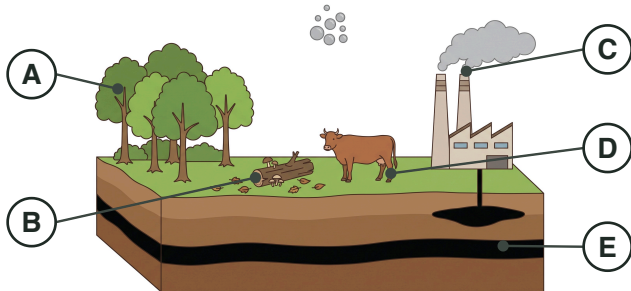
Word bank atmosphere carbon coal combustion decomposition fossil fuels fungi
greenhouse heat methane photosynthesis respiration sugar sunlight

Carbon Cycle Quiz

Score _____ / 13

Show what you know about carbon and the greenhouse effect.

Part A. This is the carbon cycle. Write the label that goes with each letter.



- A _____
B _____
C _____
D _____
E _____

Combustion · Decomposition · Fossil fuels · Photosynthesis · Respiration

Part B. Choose the best answer.

- Which process takes carbon dioxide out of the air?
☐ Respiration
☐ Photosynthesis
☐ Combustion
☐ Decomposition
- Which of these is a fossil fuel?
☐ Wood
☐ Water vapor
☐ Coal
☐ Soil
- What is combustion?
☐ Breathing
☐ Growing
☐ Rotting
☐ Burning
- Which living things break down dead plants and animals?
☐ Fungi and bacteria
☐ Trees and grass
☐ Cows and other animals
☐ Fossil fuels
- What do greenhouse gases do?
☐ Stop sunlight from reaching the ground
☐ Absorb heat given off by the ground
☐ Make the oxygen that animals breathe
☐ Cool the air near the ground
- What would Earth be like without the greenhouse effect?
☐ Too hot for most living things
☐ The same as it is now
☐ Too cold for most living things
☐ Dark for most of the day

Part C. Write your answer.

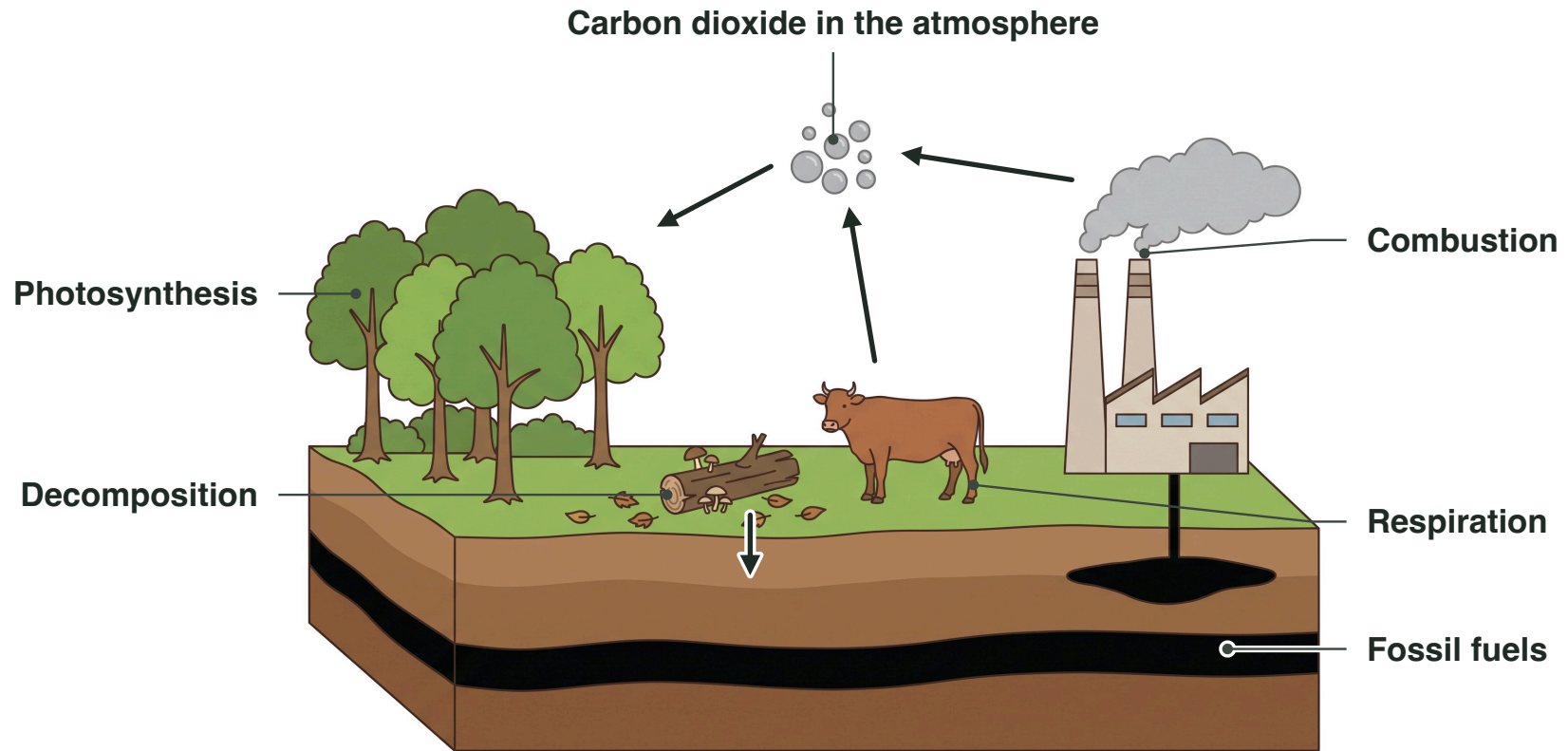
7. Name two processes that put carbon dioxide into the air.

8. How does burning fossil fuels change the amount of heat that is trapped?

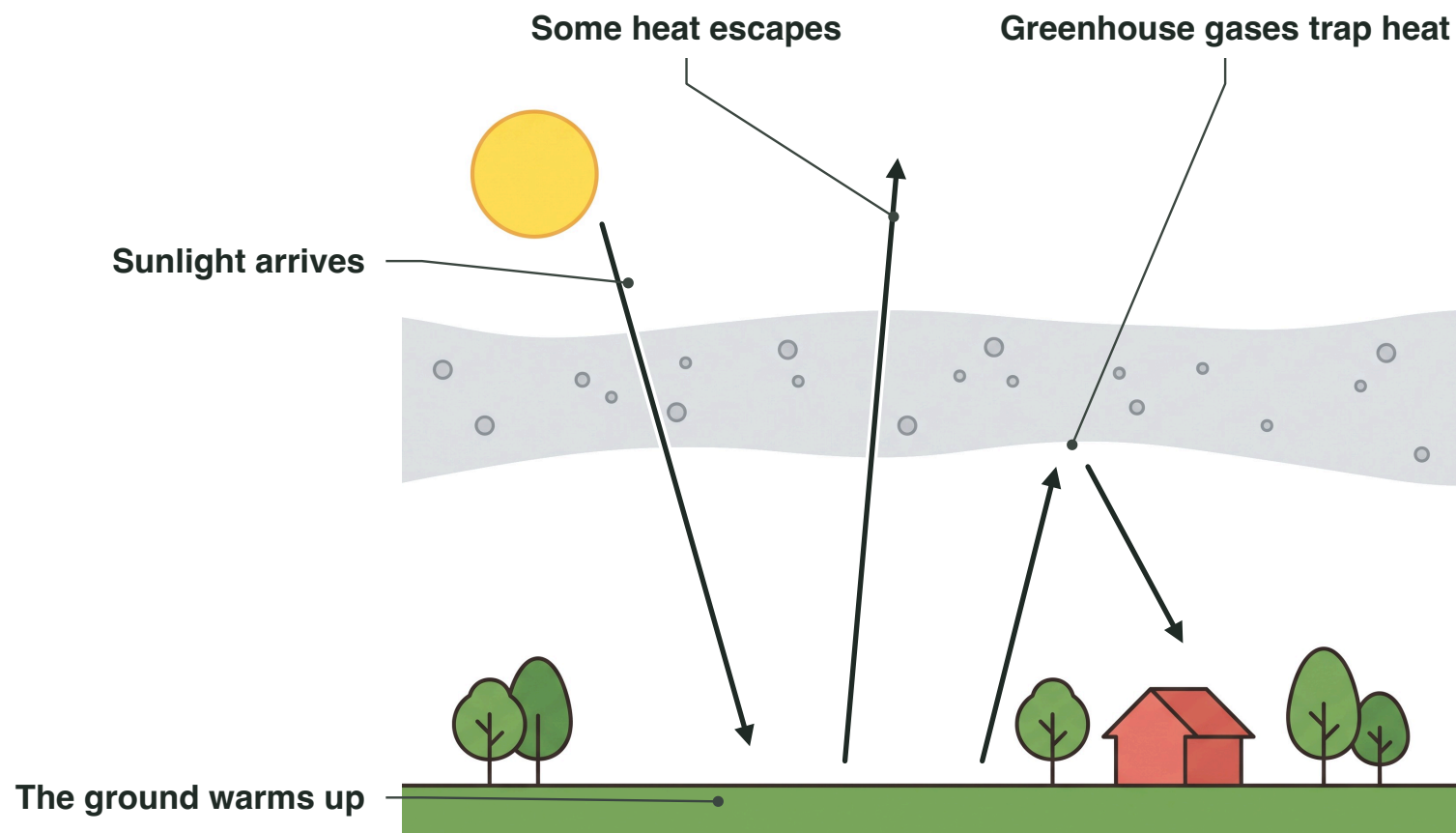
Answer Keys

In the same order as the sheets.

The Carbon Cycle: Answer Key



The Greenhouse Effect: Answer Key



The Carbon Cycle: Key Terms: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. Write the term that fits each description.

Word bank

Carbon

Carbon dioxide in the atmosphere

Combustion

Decomposers

Decomposition

Fossil fuels

Greenhouse gas

Photosynthesis

Respiration

- | | |
|---|---|
| 1. Burning. It quickly releases the carbon stored in a fuel. | Combustion |
| 2. Plants use sunlight to make sugar from water and a gas they take from the air. | Photosynthesis |
| 3. Coal, oil and natural gas, formed underground over millions of years. | Fossil fuels |
| 4. The process in which dead plants and animals break down. | Decomposition |
| 5. The gas in the air that plants take in and animals breathe out. | Carbon dioxide in the atmosphere |
| 6. Living things, such as fungi and bacteria, that break down dead matter. | Decomposers |
| 7. Living things break down food for energy and give off carbon dioxide. | Respiration |
| 8. The element found in every living thing, and in coal and oil. | Carbon |
| 9. Any gas in the air that absorbs heat given off by the ground. | Greenhouse gas |

Part B. Answer the questions.

- Which process on the diagram takes carbon dioxide out of the air?
Photosynthesis.
- Name three processes that put carbon dioxide into the air.
Respiration, decomposition and combustion.
- The carbon in coal was once in the air. Explain how it got underground.
Plants took it from the air in photosynthesis. The plants died and were buried, and over millions of years their remains became coal.

Carbon on the Move: Answer Key

Answers are in green. Written answers will vary; these are examples.

1. What is this text mostly about?

- ☐ How plants make their food
- ☒ **How carbon moves and how carbon dioxide helps keep Earth warm**
- ☐ How coal and oil are taken out of the ground
- ☐ Why Earth is too cold for living things

2. Which process takes carbon dioxide out of the air?

- ☐ Respiration
- ☐ Decomposition
- ☒ **Photosynthesis**
- ☐ Combustion

3. Name two ways carbon returns to the air.

Any two: respiration, decomposition, combustion (burning).

4. What did fossil fuels form from?

- ☐ Carbon dioxide that froze underground
- ☐ Heat given off by the ground
- ☐ Water vapor in the atmosphere
- ☒ **The buried remains of living things**

5. Number the steps 1, 2 and 3 to show how the greenhouse effect works (paragraph 4).

- 2** The warm ground gives off heat.
- 3** Greenhouse gases absorb some of the heat.
- 1** Sunlight warms the ground.

6. What would Earth be like without the greenhouse effect?

- ☒ **Too cold for most living things**
- ☐ Too hot for most living things
- ☐ Dark for most of the day
- ☐ The same as it is now

7. Name two greenhouse gases.

Any two: carbon dioxide, methane, water vapor.

8. How does burning fossil fuels change the amount of heat that is trapped?

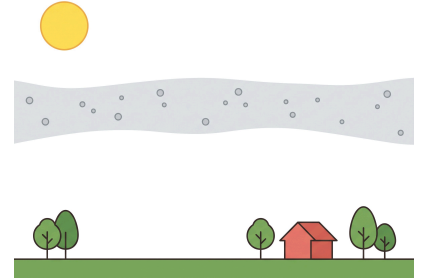
It adds extra carbon dioxide to the air. With more carbon dioxide in the air, more heat is trapped.

How the Greenhouse Effect Works: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. Number the steps from 1 to 6.

- 1** Sunlight passes through the atmosphere and reaches the ground.
- 3** The warm ground gives off heat, which travels up into the atmosphere.
- 4** Greenhouse gases in the atmosphere absorb some of that heat.
- 2** The ground absorbs the sunlight and warms up.
- 6** The ground and the air near it stay warmer than they would without these gases.
- 5** The gases send part of the heat they absorbed back down toward the ground.



Part B. Answer the questions.

1. Greenhouse gases do not absorb all of the heat from the ground. What happens to the rest?

It passes through the atmosphere and escapes into space.

2. The greenhouse effect is natural. Why do living things need it?

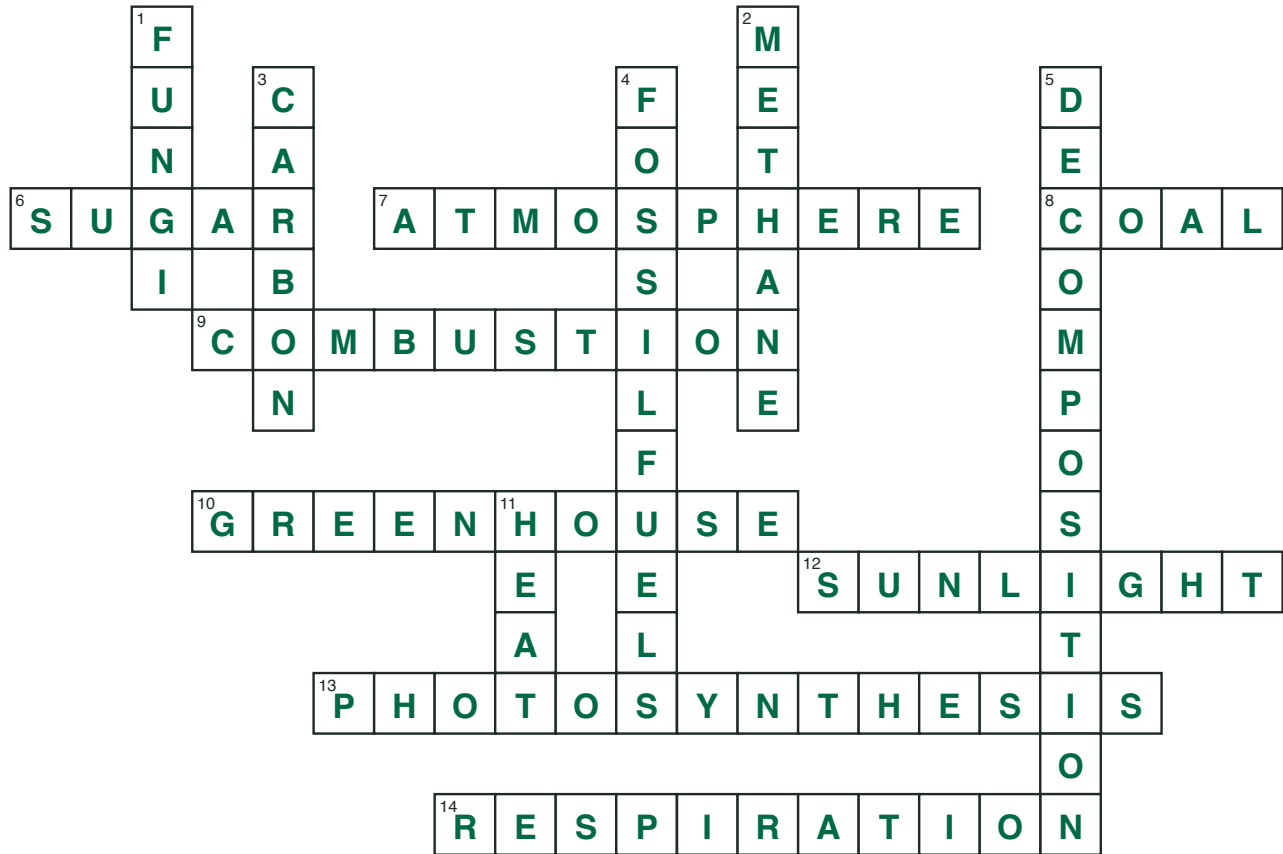
It keeps Earth warm enough for life. Without it, Earth would be too cold for most living things.

3. Burning fossil fuels adds carbon dioxide to the air. What does that do to the amount of heat that is trapped? Explain.

More heat is trapped. Carbon dioxide is a greenhouse gas, so more of it absorbs more of the heat from the ground.

Carbon Cycle Crossword: Answer Key

Answers are in green.



ACROSS

6. The food a plant makes from carbon dioxide and water.
7. The layer of gases around Earth.
8. A black, solid fuel that formed underground over millions of years.
9. Another word for burning.
10. A ____ gas absorbs heat given off by the ground.
12. It shines on Earth by day and warms the ground.
13. Plants use energy from the Sun to make sugar from carbon dioxide and water.
14. Living things break down food for energy and give off carbon dioxide.

DOWN

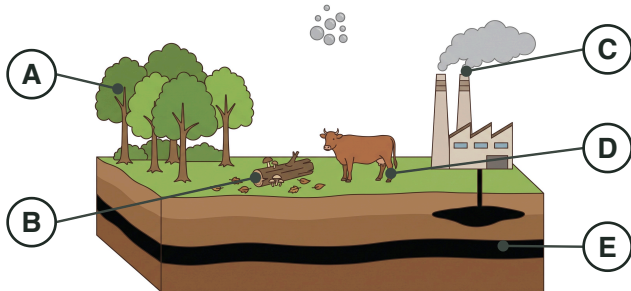
1. Mushrooms belong to this group. They help break down dead plants.
2. Like carbon dioxide and water vapor, this gas absorbs heat.
3. The element found in every living thing.
4. Coal, oil and natural gas (2 words).
5. The breaking down of dead plants and animals.
11. The warm ground gives this off. Some of it escapes into space.

Word bank atmosphere carbon coal combustion decomposition fossil fuels fungi
greenhouse heat methane photosynthesis respiration sugar sunlight

Carbon Cycle Quiz: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. This is the carbon cycle. Write the label that goes with each letter.



A **Photosynthesis**

B **Decomposition**

C **Combustion**

D **Respiration**

E **Fossil fuels**

Combustion · Decomposition · Fossil fuels · Photosynthesis · Respiration

Part B. Choose the best answer.

1. Which process takes carbon dioxide out of the air?

- ☐ Respiration
- ☒ **Photosynthesis**
- ☐ Combustion
- ☐ Decomposition

2. Which of these is a fossil fuel?

- ☐ Wood
- ☐ Water vapor
- ☒ **Coal**
- ☐ Soil

3. What is combustion?

- ☐ Breathing
- ☐ Growing
- ☐ Rotting
- ☒ **Burning**

4. Which living things break down dead plants and animals?

- ☒ **Fungi and bacteria**
- ☐ Trees and grass
- ☐ Cows and other animals
- ☐ Fossil fuels

5. What do greenhouse gases do?

- ☐ Stop sunlight from reaching the ground
- ☒ **Absorb heat given off by the ground**
- ☐ Make the oxygen that animals breathe
- ☐ Cool the air near the ground

6. What would Earth be like without the greenhouse effect?

- ☐ Too hot for most living things
- ☐ The same as it is now
- ☒ **Too cold for most living things**
- ☐ Dark for most of the day

Part C. Write your answer.

7. Name two processes that put carbon dioxide into the air.

Any two: respiration, decomposition, combustion (burning).

8. How does burning fossil fuels change the amount of heat that is trapped?

It adds extra carbon dioxide to the air, so more heat is trapped.