



higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA



GAUTENG
Community Education and Training
CET COLLEGE

NATURAL SCIENCES: NATS4 NOTES AND ACTIVIES – US 7509

LESSION THREE

THEME: Life and Living

TOPIC: Cycles in the Biosphere – PART 2

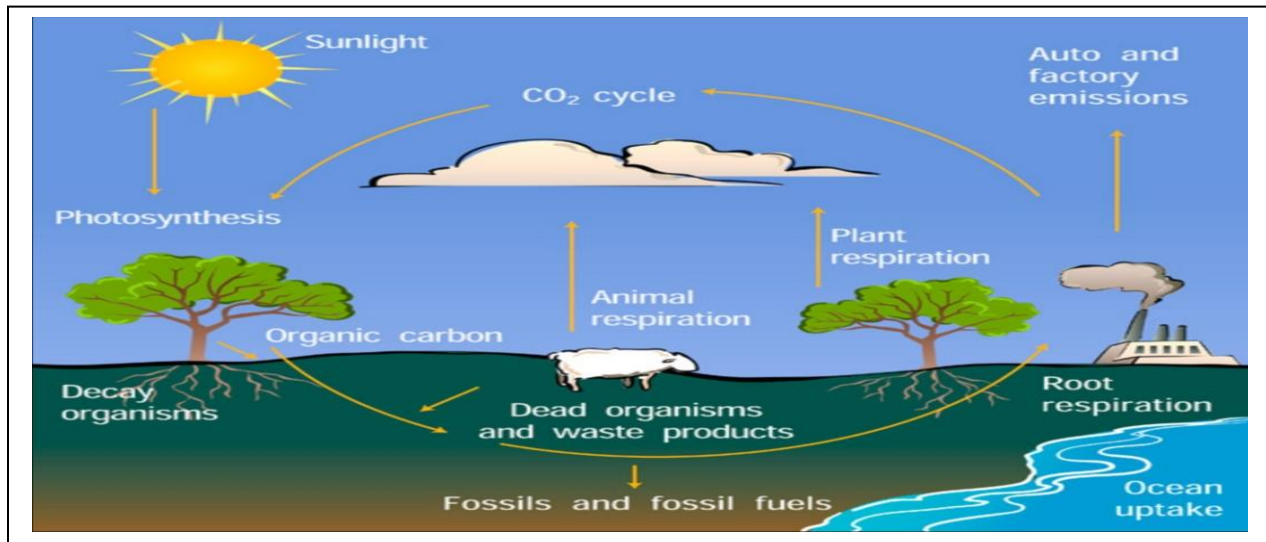
At the end of this unit, you should be able to:

1. Define and distinguish between carbon cycle and oxygen cycle.
2. Explain processes in involved in how the cycles occur.

A. CARBON CYCLE

1. All living things contain carbon in some form. Carbon (C) is the primary component of macromolecules, including proteins, lipids, nucleic acids, and carbohydrates.
2. Carbon's molecular structure allows it to bond in many different ways and with many different elements.
3. Without carbon no living organism could survive.

4. Carbon comes originally from the gas carbon dioxide(CO₂) which makes up



0.03% of the atmosphere

5. The diagram above shows how carbon cycles between the land, ocean and atmosphere.

5.1 **Carbon dioxide (CO₂)** released by humans and animals, and the **carbon monoxide (CO)** emitted by various modes of transport and chemical industries is collected in the atmosphere.

5.2 The excess carbon dioxide in the atmosphere gets used up by trees and green plants to make their own food through the process called **photosynthesis**.

5.3 Humans and animals that eat the plants take in some of the carbon and breathe out carbon dioxide to the atmosphere.

5.4 Carbon dioxide is also released to the ground when decomposers, e.g. worms, dung beetles, bacteria and fungi, process and digest waste (feces) and dead organisms, i.e. when animals and plants decay.

5.5 Burning fossil fuels (coal, oil and wood) also releases carbon dioxide into the air through a process called **combustion**.

5.6 The release of too much carbon dioxide into the air causes **global warming** which is the gradual increase of the temperature of the Earth's atmosphere.

ACTIVITY

1. The processes listed below have an effect on the amount of carbon dioxide in the atmosphere.

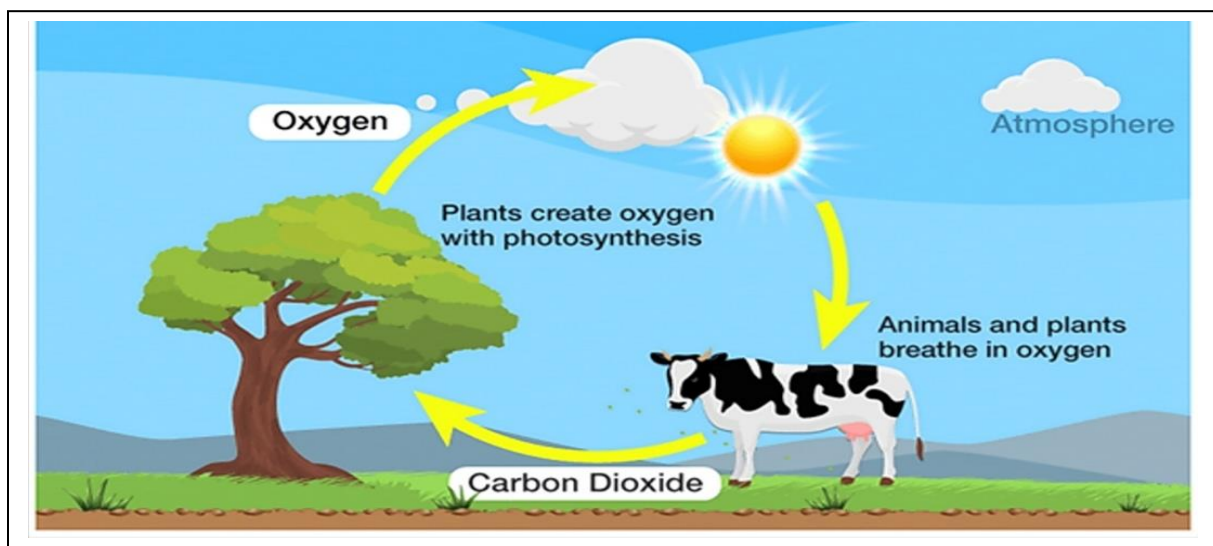
Photosynthesis, Combustion, Respiration and Decay

Indicate which causes the carbon dioxide in the air to increase and which cause the carbon dioxide in the air to decrease.

2. How does too much carbon dioxide affect the atmosphere?
 3. Which carbon compound is extremely dangerous to humans? Carbon dioxide or Carbon monoxide.
 4. List THREE industrial uses of carbon dioxide.
 5. Why living things cannot survive without carbon?
 6. What is the importance of decomposers in the carbon cycle?
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B. OXYGEN CYCLE

1. The Earth's atmosphere contains a constant amount of oxygen (about 21%).



2. Oxygen (O_2) is the cycled through ecosystems as shown in the diagram.

- 2.1 Living things take in oxygen from the air. They use it to burn up carbohydrate food to get energy to live during the process called respiration.
- 2.2 Living things also need oxygen to build new molecules in their bodies using carbon, hydrogen and nitrogen as well.
- 2.3 Oxygen is released back to the atmosphere during the day by green plants during photosynthesis.
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ACTIVITY

1. Why is oxygen important in the ecosystem?
 2. Is oxygen a diatomic molecule? Explain.
 3. (a) How do green plants release oxygen into the atmosphere?
(b) Does this happen at night or during the day? Explain the reason for this.
 4. Write THREE properties of oxygen.
 5. Differentiate between aerobic and anaerobic respiration.
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