# **Carbon Cycle and Global Warming**

Biosphere def:			

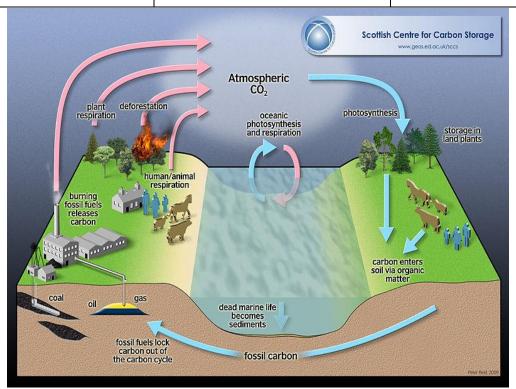
• Made up of the lithosphere, hydrosphere and atmosphere

# **Carbon Cycle**

Def: \_\_\_\_\_

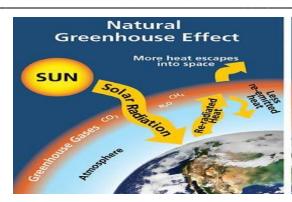
## **3 forms of Carbon**

CO <sub>2</sub>	CH <sub>4</sub>	CaCO <sub>3</sub>



Process which take in CO <sub>2</sub>	Process which release CO <sub>2</sub> and methane

## Global Warming (greenhouse effect):





#### Pollutants:

## Nitrous Oxide

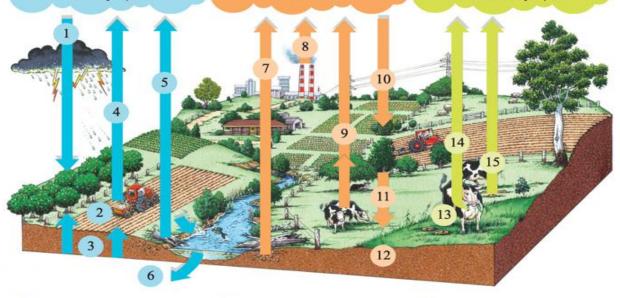
is mainly released through soil disturbance, nitrogen fertilisers, urine and dung. The global warming potential of nitrous oxide is 310 times that of carbon dioxide over a 100 year period.

### Carbon Dioxide

is mainly released through burning of fossil fuels, plant decay and insect and microbial activity in soils. It is also absorbed by plants through photosynthesis and stored in soils and trees.

### Methane

is mainly released from cows and sheep following digestion of plant matter. The global warming potential of methane is approximately 25 times that of carbon dioxide over a 100 year period.



- Nitrogen fixed by lightning (falls in rain) and nitrogen fixing bacteria in legumes
- Nitrogen-based fertilisers applied to pasture or crops
- 3 Nitrogen taken up by pasture, crops and trees
- 4 Nitrous oxide released through volatilisation of urea fertiliser
- 5 Nitrous oxide released through process of denitrification
- 6 Nitrogen loss through runoff and leaching from fertilisers and nitrification process in soil

- Carbon dioxide released through plant decay, and insect and microbial activity in the soil
- 8 Carbon dioxide released from burning fossil fuels to produce electricity and fuel
- Garbon dioxide released by animals and plants through respiration
- Carbon absorbed by trees, pasture and crops through photosynthesis
- 11 Animals consume carbon by eating plants
- 12 Carbon from organic residues (e.g. dead leaves, roots, manure & urine) absorbed into the soil
- Methane (CH4) is produced within the rumen (fore-stomach) during digestion, via a chemical reaction between carbon and hydrogen
- Methane released by cows and sheep burping following ruminant digestion
- Small amounts of methane released from fermentation of animal dung and urine under anaerobic (no oxygen) conditions

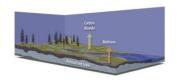
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# **Consequences of thawing permafrost**

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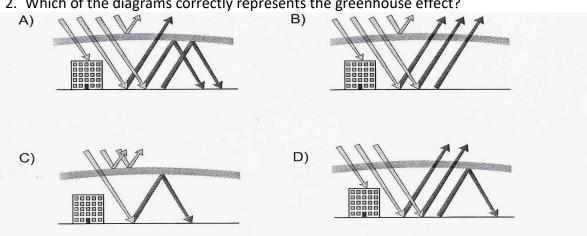




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## Past exam questions

- Which of the following is not a consequence of the warming of the permafrost?
  - A) Landslides
  - B) Unstable infrastructure (buildings and roads)
  - C) A decrease in the amount of vegetation
  - D) The release of greenhouse gases
- 2. Which of the diagrams correctly represents the greenhouse effect?



3. Which of the following choices (A, B, C and D) correctly matches each natural phenomenon with its impact on the quantity of atmospheric CO<sub>2</sub>?

	•		
	A volcanic eruption	Photosynthesis	A dissolution of atmospheric
			CO <sub>2</sub> in the ocean
A)	Increases CO <sub>2</sub>	Decreases CO <sub>2</sub>	Decreases CO <sub>2</sub>
B)	Increases CO <sub>2</sub>	Increases CO <sub>2</sub>	Decreases CO <sub>2</sub>
C)	Decreases CO <sub>2</sub>	Decreases CO <sub>2</sub>	Increases CO <sub>2</sub>
D)	Decreases CO <sub>2</sub>	Increases CO <sub>2</sub>	Increases CO <sub>2</sub>

4. Global warming could have a significant impact on polar regions. Authorities have therefore thought about moving certain northern villages because roads could become unfit for travel and landslides could occur. Large quantities of methane and carbon dioxide could be released into the air. What is responsible for these consequences of global warming?

A) Forest decline

C) A change in the flow of water in a drainage basin

B)Increasing precipitation

D) Melting permafrost

5. In nature, carbon follows a cycle and moves through the Earth's different spheres, namely the atmosphere, the biosphere, the hydrosphere and the lithosphere. Which of the following human activities has the least influence on the carbon cycle?

A) Intensive tree cutting

C) Burning fossil fuels

B) Raising dairy cows

D) Operating a nuclear power plant

6. It is said that using wood to build houses helps in the fight against climate change because trees store some of the atmospheric carbon. Through what carbon cycle process do trees store atmospheric carbon?

A) Photosynthesis

C) Plant decomposition

B) Cellular respiration

D) Fossil fuel combustion