

What is the Carbon Cycle?

Worksheet

The carbon cycle is the natural process by which carbon moves between the atmosphere (as CO₂), living things, oceans, and geological reservoirs through photosynthesis, respiration, decomposition, and combustion.

Questions

1. Which process removes CO₂ from the atmosphere and stores it in plants?
A) Respiration
B) Photosynthesis
C) Combustion
D) Decomposition
2. Which process releases stored carbon back into the atmosphere as CO₂ fastest?
A) Fossilization
B) Photosynthesis
C) Combustion of fossil fuels
D) Ocean sediment formation
3. Burning 200 kg of pure carbon produces about how much CO₂?
A) 200 kg
B) 734 kg
C) 44 kg
D) 1,835 kg
4. Where is most of Earth's carbon stored long-term?
A) The atmosphere
B) Living organisms
C) Rocks and fossil fuels
D) Fresh water
5. A power plant burns 500 kg of pure carbon. How much CO₂ is released into the atmosphere?
6. A forest fixes 24 kg of carbon into new wood in one season. What mass of CO₂ did it remove from the atmosphere?
7. Global fossil fuel burning releases about 9 gigatonnes (Gt) of pure carbon per year. Estimate the annual CO₂ released.
8. Define: What is the carbon cycle?
9. Define: How does carbon enter living organisms?
10. Define: How is carbon returned to the atmosphere?

Answer Key

1. B) Photosynthesis - Photosynthesis converts atmospheric CO₂ into organic carbon (glucose) using sunlight.
2. C) Combustion of fossil fuels - Burning fossil fuels rapidly releases carbon that took millions of years to accumulate.
3. B) 734 kg - $m(\text{CO}_2) = 200 \cdot 3.67 = 734 \text{ kg}$.
4. C) Rocks and fossil fuels - Sedimentary rocks and fossil fuel deposits hold the vast majority of Earth's carbon.
5. $m(\text{CO}_2) = m(\text{C}) \cdot 3.67$
 $m(\text{CO}_2) = 500 \cdot 3.67 = 1,835 \text{ kg}$
6. $m(\text{CO}_2) \text{ removed} = m(\text{C}) \cdot 3.67$
 $m(\text{CO}_2) \text{ removed} = 24 \cdot 3.67 = 88.08 \text{ kg CO}_2$
7. $m(\text{CO}_2) = m(\text{C}) \cdot 3.67$
 $m(\text{CO}_2) = 9 \cdot 3.67 = 33.03 \text{ Gt CO}_2 \text{ per year}$
8. The continuous movement of carbon between the atmosphere, living organisms, oceans, soil, and rocks.
9. Through photosynthesis, when plants and algae convert atmospheric CO₂ into organic carbon compounds.
10. Through respiration, decomposition, and the combustion of fossil fuels or biomass.

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