

Name _____

Decomposition: Nature's Recycling Magic

Open-Ended Response Answer Key

1. The decomposition process consists of multiple stages, including the initial breakdown of organic matter by detritivores and decomposers. These organisms break down materials into smaller pieces, making them accessible to bacteria and fungi. Bacteria and fungi further break down organic matter into simpler substances, releasing carbon dioxide and essential nutrients into the environment. Nutrients enrich the soil, benefiting plant growth, and carbon is returned to the atmosphere or stored in the soil.
2. Decomposition is vital for maintaining the health and balance of ecosystems. It recycles nutrients, enriches the soil, and prevents the accumulation of dead organic matter. Without decomposition, ecosystems would become overwhelmed with dead material, hindering plant growth and nutrient cycling.
3. Decomposition contributes to the Earth's carbon cycle by releasing carbon dioxide into the atmosphere as a byproduct. This carbon dioxide is absorbed by plants during photosynthesis, balancing the carbon cycle. Additionally, some carbon from decomposed organic matter can become part of a carbon sink when it is incorporated into stable organic matter in the soil.
4. As a scientist studying decomposition, I would conduct experiments to investigate the factors that influence decomposition rates, such as temperature, moisture, and the type of organic matter. I would also explore how changes in decomposition rates could impact carbon cycling and nutrient availability in ecosystems. These studies could provide insights into how to manage ecosystems and organic waste more effectively while mitigating the impact of climate change.

