

Comprehension Questions - Module 6: Metabolism

Energy and Enzymes

1. Explain the relationship between energy, work, and metabolism in living organisms.
2. Compare and contrast potential energy and kinetic energy, and give biological examples of each.
3. Describe how enzymes lower activation energy and increase reaction rates.
4. Explain how factors such as temperature, pH, and substrate concentration affect enzyme activity.

ATP and Energy Coupling

1. Explain the structure of ATP and why it is called the "energy currency" of the cell.
2. Describe how ATP is synthesized and how it drives cellular work.
3. How do cells couple exergonic and endergonic reactions to drive metabolic processes?

Metabolic Pathways

1. Compare and contrast anabolic and catabolic pathways, and explain how they are interconnected.
2. Explain how feedback inhibition regulates metabolic pathways.
3. Describe how metabolic pathways are organized and controlled in cells.

Cellular Respiration Overview

1. Explain the overall equation for cellular respiration and identify the inputs and outputs.

2. Compare and contrast aerobic and anaerobic respiration in terms of efficiency and products.
3. How do cells extract energy from glucose through different metabolic pathways?

Regulation of Metabolism

1. Explain how cells regulate metabolic activity to maintain homeostasis.
2. Describe how different cell types can have different metabolic needs and pathways.