ATP - ADP Cycle

Mr. McRae
Objective: I can explain why ATP is useful to cells.
Energy in Cells

- Organisms need energy to carry out their essential life processes.
- Their cells obtain energy from the chemical bonds that hold together certain organic compounds, such as carbohydrates.
- Cells use this energy to make ATP (adenosine triphosphate).
ATP - Adenosine Triphosphate

- ATP - is an organic molecule used for short-term energy storage and transport in the cell.
- ATP serves as the primary energy source for the cell’s activities.
- When energy is needed somewhere in a cell, the chemical energy stored in glucose is released and used to produce ATP molecules.
ATP - Adenosine Triphosphate

ATP is composed of three parts:

1. A nitrogenous base (Adenine)
2. A sugar (Ribose)
3. Three phosphate groups (Triphosphate)
ATP
To release the energy stored in ATP molecules, bonds between their phosphate groups are broken through hydrolysis.

**Hydrolysis** is a chemical reaction in which a water molecule splits another molecule.

As a result of hydrolysis, energy is released and ATP loses a phosphate to become **ADP (Adenosine diphosphate)**.
Storing Energy

- Small amounts of energy can be stored in a cell by adding phosphate groups to ADP molecules, producing ATP.
- ADP is constantly recombined with phosphate groups to form new molecules of ATP to support the work of the cell.
ATP-ADP Cycle
ATP-ADP Cycle
Checking for Understanding:

- Complete questions #1-2 (a,b,c) on page 228.
- Turn in!