



# Cellular Respiration

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- » Cellular respiration is the process in which organisms break down food to create usable energy.
- » Chemical energy in food is converted into mechanical and thermal energy in the living organism.



# The Chemical Formula of Cellular Respiration

## Cellular Respiration



- » Glucose + 6 molecules of oxygen produce 6 molecules of carbon dioxide + 6 molecules of water + mechanical and thermal energy.



# Where does cellular respiration occur?

- » Cellular respiration occurs within **every cell** of **every living** organism.
- » It occurs within the **mitochondria** of each cell.



# What is the energy from cellular respiration used for?

1. Movement
2. Growth
3. Development
4. Reproduction
5. Warmth



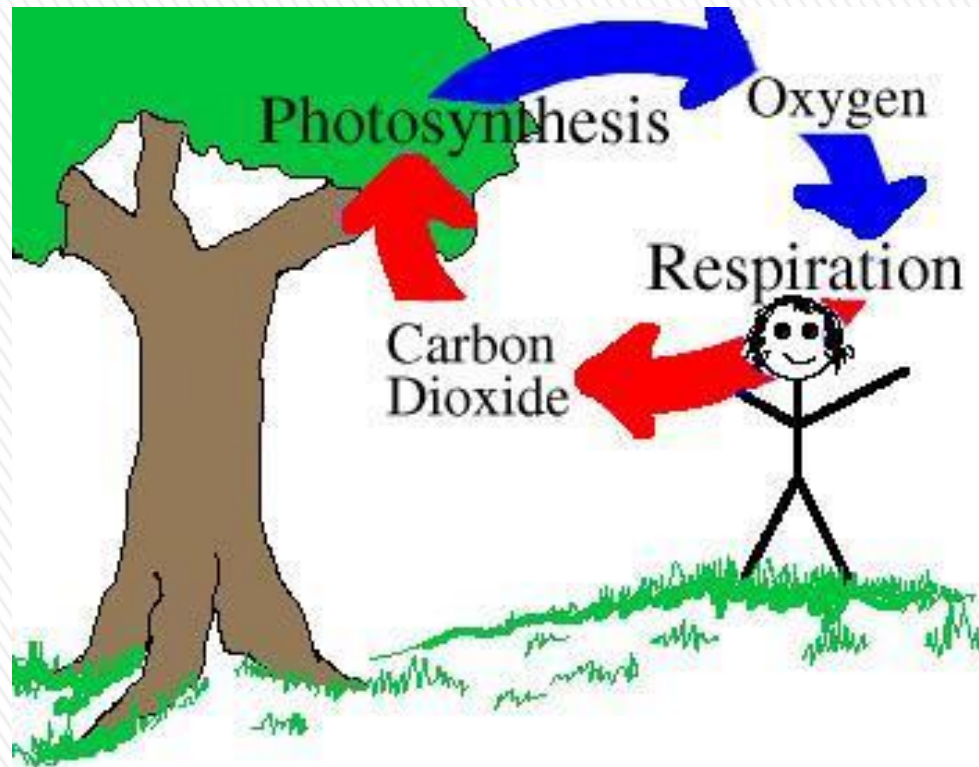
# Energy Conversions

- » Which types of energy are converted from the sun to a person moving?
- » **Radiant/Solar/Light** (light from sun)
- » **Chemical** (glucose stored in plant through photosynthesis, cellular respiration & digestion in animal)
- » **Mechanical** (organism breaks down glucose to produce energy to move and grow)
- » **Thermal** (heat is released in the atmosphere)



# The Oxygen Cycle

- » Photosynthesis and Cellular Respiration are complimentary reactions that result in the oxygen cycle.
- » The products of **photosynthesis** are the reactants of **cellular respiration** and the products of **cellular respiration** are the reactants of photosynthesis.



# Photosynthesis vs. Respiration

» **Reaction:**  $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

» **Reactants:** Carbon dioxide, water, sun

» **Products:** Glucose

» **Waste products:** Oxygen

» **Energy needs:** Requires energy

» **Summary:** Sugar synthesized using energy from the sun

$\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy}$

Glucose, oxygen

Energy

Carbon dioxide, water

Releases energy

Energy released from sugar breakdown

