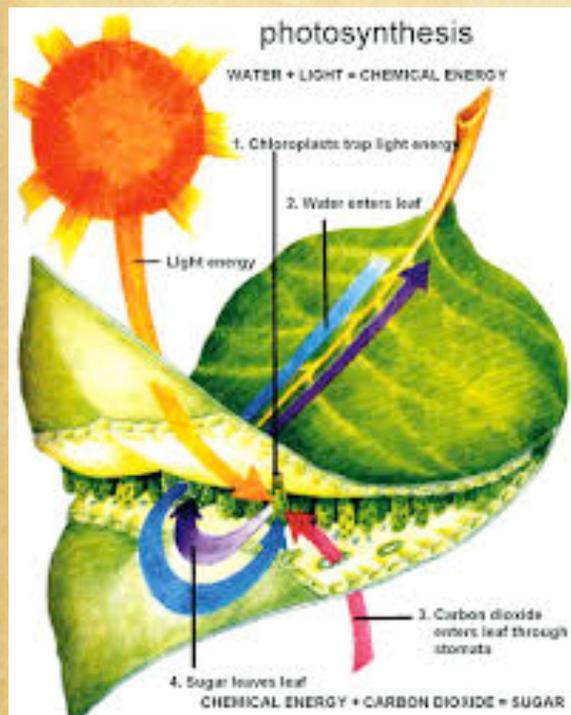


How Do Cells Get Energy?

Chapter 2 Lesson 4
Part 2

ByDesign Science, Level 6
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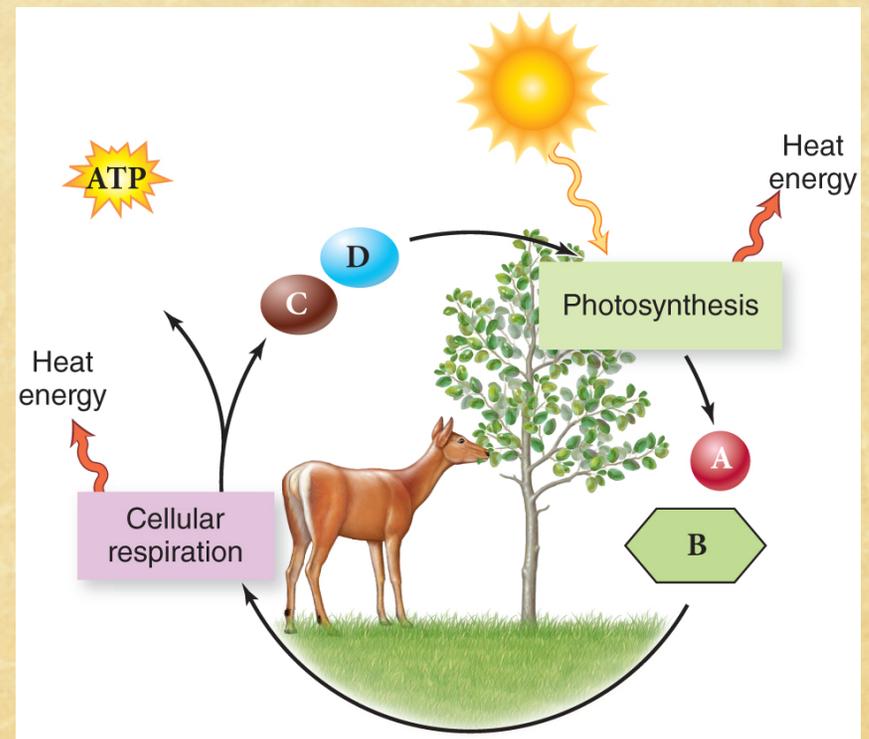
Cell Respiration



- ◆ At night, the light reaction of photosynthesis shuts down.
- ◆ However, the transport of nutrients into cells, removal of wastes from cells, building of new cell parts, and other functions do not stop because it is dark.
- ◆ Energy is still needed to carry on these life processes.

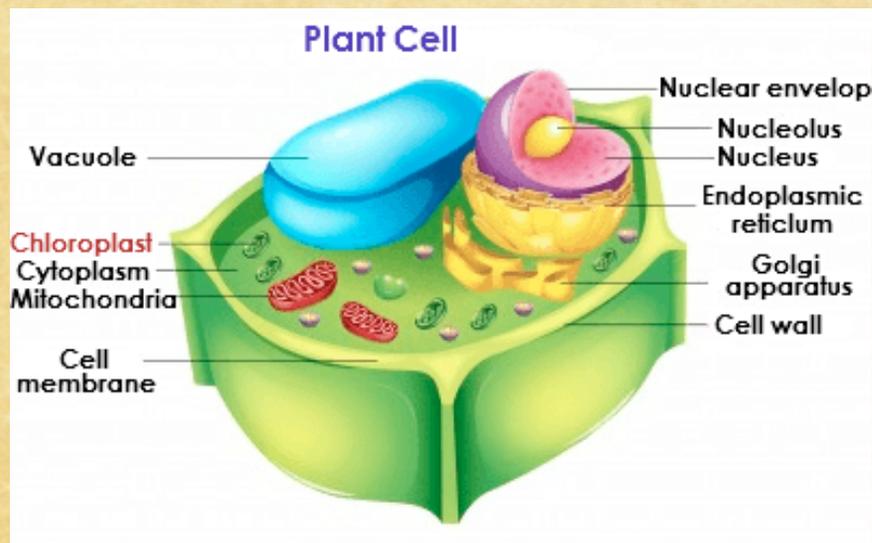
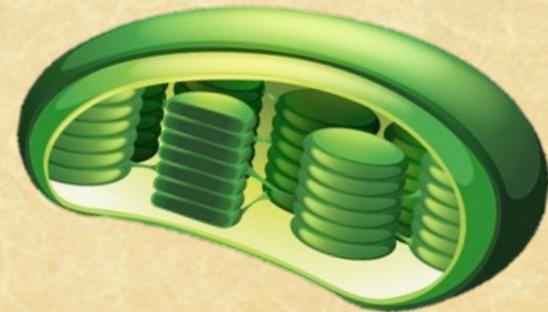
Cell Respiration

- ♦ The chemical energy stored during photosynthesis is made accessible for use by the cell through cell respiration.
- ♦ Cell respiration involves processes with and without oxygen.



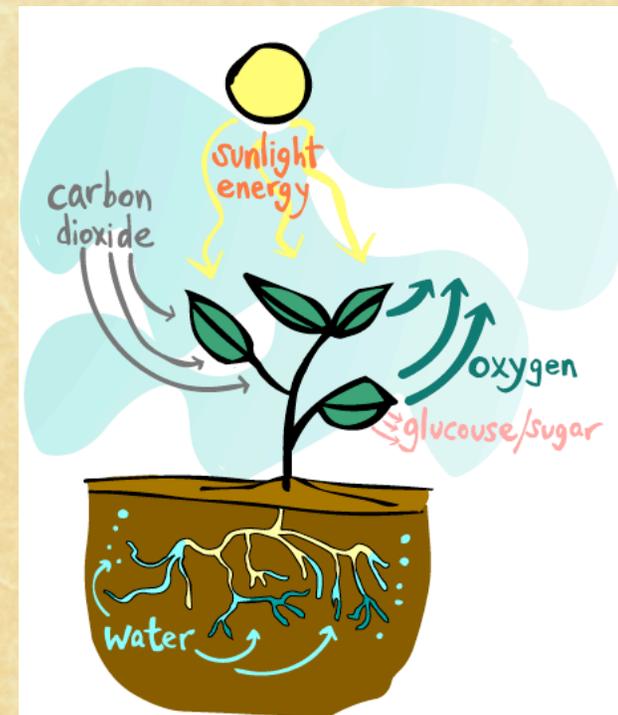
Cell Respiration: Glycolysis

- ◆ Glycolysis is a process that breaks down glucose molecules.
- ◆ It occurs in the cytoplasm.
- ◆ It does not require oxygen.



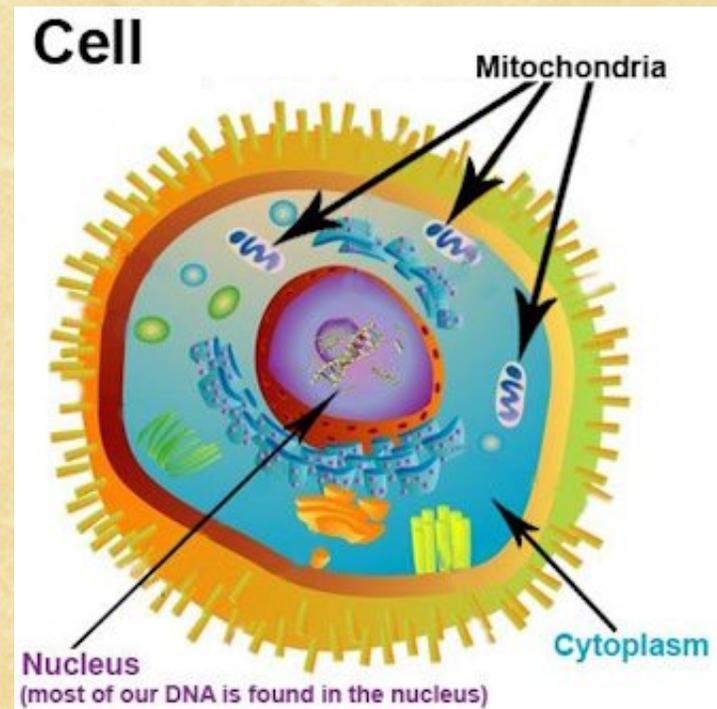
Cell Respiration: Glycolysis

- ♦ The process yields pyruvate and a small amount of ATP molecules.
- ♦ Pyruvate is a type of acid necessary to convert sugar to energy.



Cell Respiration: Aerobic Respiration

- ◆ Aerobic respiration occurs in the mitochondria.
- ◆ Oxygen is required for this process.
- ◆ The pyruvate made during glycolysis enters the mitochondria.
- ◆ This process yields many ATP molecules.



Cell Respiration: Fermentation



- ♦ Fermentation is a type of anaerobic respiration, a process that does not require oxygen.
- ♦ Pyruvate is converted into water, carbon dioxide, and either lactic acid or alcohol. A small amount of ATP molecules is produced.

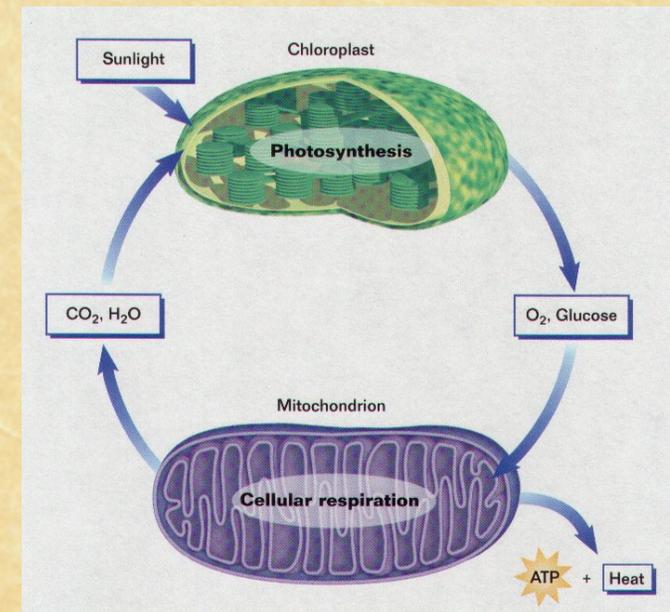
Cell Respiration: Fermentation



- ♦ Lactic acid is mainly produced in muscles and can be used as a source of energy. It is also used in food making.
- ♦ Fermentation by yeast cells is important in baking bread and making wine.

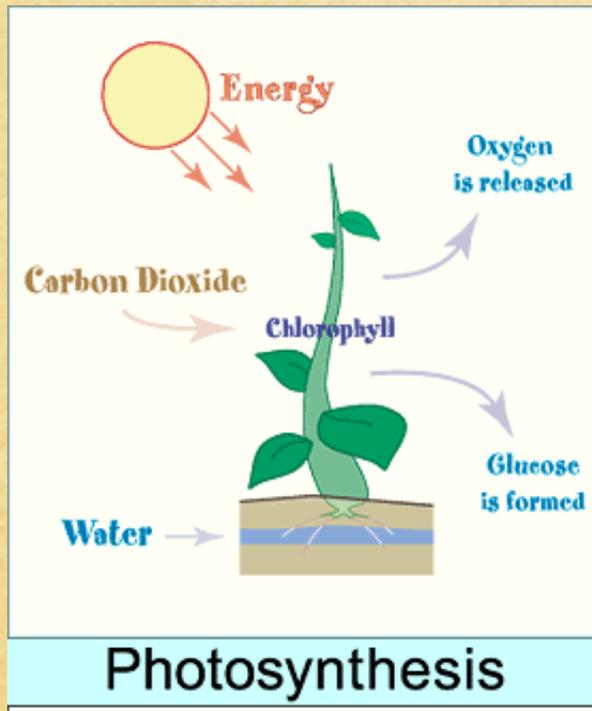
Photosynthesis and Cell Respiration are Related

- ◆ You can see God's design in the two processes that maintain life on Earth: photosynthesis and cell respiration.
- ◆ Photosynthesis builds the molecule that provides the energy for life.
- ◆ Cell Respiration breaks this molecule down to meet the cell's current energy needs.



Photosynthesis and Cell Respiration are Related

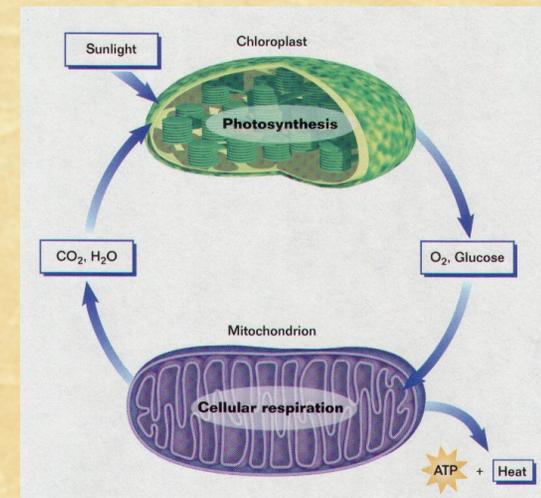
- ◆ Nearly every creature on Earth uses the food, or chemical energy, produced through photosynthesis by plant cells.



- ◆ Both plant and animal cells use the oxygen that plants give off during photosynthesis for cell respiration.

Photosynthesis and Cell Respiration are Related

- ◆ Photosynthesis and cell respiration go together.
- ◆ They involve the same basic chemical materials:
 - ◆ Carbon Dioxide
 - ◆ Water
 - ◆ Oxygen
 - ◆ ATP
 - ◆ ADP
 - ◆ Glucose
- ◆ Each reaction yields the opposite result of the other.



Cellular Respiration and the Mighty Mitochondria

