Cellular Respiration

Opposite of photosynthesis!

Process in which mitochondria break down food molecules to produce ATP (Energy)

Equation (6,6,6)

Reactants ← what you NEED!

Products ← What comes out!

oxygen (6) + glucose $(CHO)_{6,12,6}$ → Heat + water (6) + carbon dioxide (6)

$6O_2 + C_6H_{12}O_6 \rightarrow Heat + 6H_2O + 6CO_2$

There are 3 stages to Cellular Respiration: Glycolysis, Citric Acid Cycle, Electron transport chain.

1) Glycolysis: Requires NO oxygen.
Will occur without oxygen being present.
- Occurs in the cytoplasm. (Body of cell) Inside
- Produces 2 ATP's
- Always happens

2) Citric Acid Cycle / Krebs Cycle
- Requires oxygen (Aerobic)
- Occurs in the mitochondria
- For long distance sports (XC, soccer, running back, swimming,
- Produce 2ATP + $2CO_2$

3) Electron transport Chain (ETC)
- Aerobic (requires oxygen)
- Electrons lose energy as they work
- The oxygen helps form water
- Produces 32 ATP molecules

If oxygen is NOT present after Glycolysis, then the process becomes Anaerobic (without oxygen)
This process is called Lactic Acid Fermentation.

Lactic Acid Fermentation

Supplies energy when oxygen is not available
ie when doing heavy exercise.
Ex: Sprinting, Heavy lifting,
makes muscles tired
lactic Acid formes in muscles
Results in 2ATP molecules

Alcoholic Fermentation

- Doesn't happen to humans!
- Used by yeast + other bacteria
- Produces ethyl alcohol + CO_2
- How bread, beer, + wine is made
- when yeast gives off CO_2, it causes bread to rise and bubbles to form in the middle.

Photosynthesis

- The process of using light energy to make sugar (glucose)
- Autotrophs (Aka Producers) Like Plants, Algae, and Bacteria
  - All organisms that make its own energy (self-feeding)

Auto = self troph = feeding

*Opposite of Cellular Respiration!

Photosynthesis - Converts energy from the sun (light energy) into chemical energy in the form of carbohydrates (glucose)

Reactants ← what you need Equation (6,6,6) Products ← What is made (comes out)

Sun + Carbon Dioxide (6) + water (6) → glucose ($C_6H_{12}O_6$) + oxygen (6)

Sun + 6 CO_2 + 6 H_2O → $C_6H_{12}O_6$ + 6 O_2

This happens (photosynthesis) in 2 Stages: Light Reaction and Dark reaction

1.) Light reaction / Light dependant reaction (requires light)
- Hydrolysis occurs - Water (H_2O) broken into oxygen (O_2)
- Takes place in the thylakoid membranes.

2.) Dark Reaction / Light Independant Reaction / Calvin Cycle (doesn't require light)
- CO_2 (Carbon dioxide) is broken apart into glucose ($C_6H_{12}O_6$)

There are two main parts of the chloroplast

1) Thylakoids (look like green pancakes)
- The light reaction occurs here.
- Hydrolysis occurs here.

2) Stroma (space around thylakoids)
- Dark reaction occurs here
- CO_2 (Carbon dioxide) turns into $C_6H_{12}O_6$ (glucose)

Photosynthesis happens so that the glucose made feeds the Heterotrops (Animals and humans), and to produce Oxygen. (consumers)