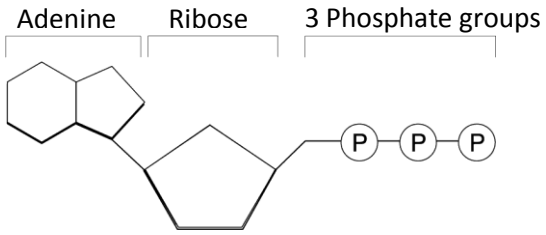
Cell Energy (Photosynthesis and Respiration) Notes

Energy:

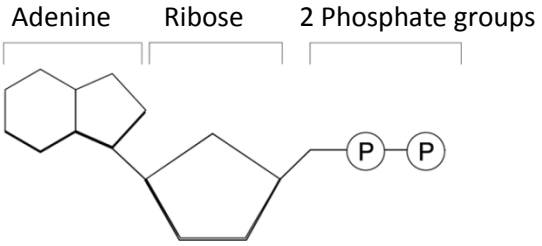
- Energy for living things comes from _____. Originally, the energy in food comes from the _____.
- Organisms that use _____ _____ from the sun to produce food—_____ (auto = self)
  Ex: _____ and some microorganisms (some bacteria and protists)
- Organisms that _____ use the sun's energy to make food—_____
  Ex: _____ and most microorganisms

Cell Energy:

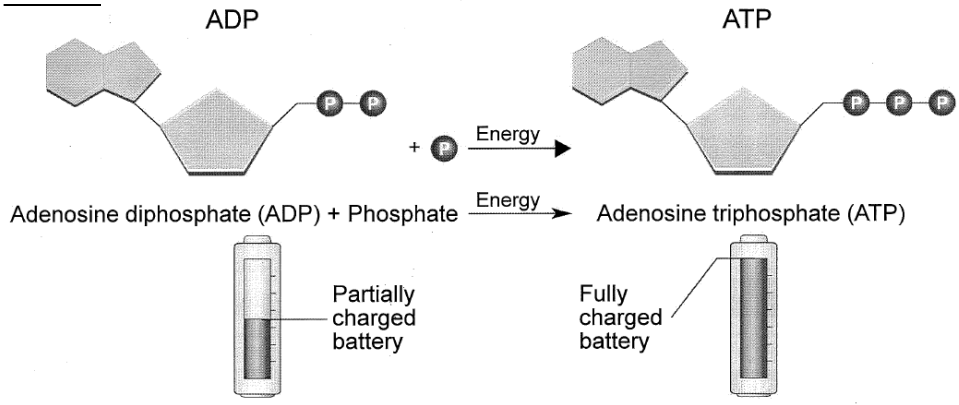
- Cells usable source of _____ is called _____
- ATP stands for _____ _____



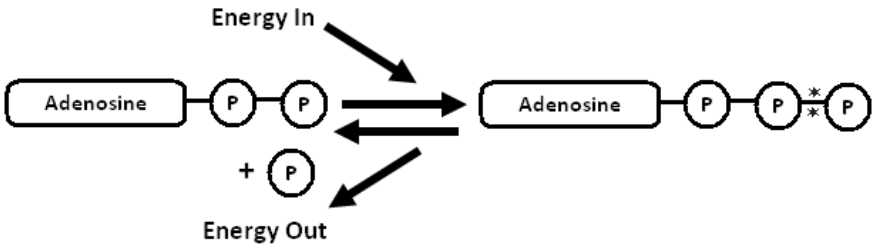
- ADP stands for _____ _____



- All energy is stored in the _____ of compounds—_____ the bond _____ the energy
- When the cell has energy available it can store this energy by adding a _____ _____ to ADP, producing _____



- ATP is converted into ADP by breaking the _____ between the second and third phosphate groups and releasing _____ for cellular processes.



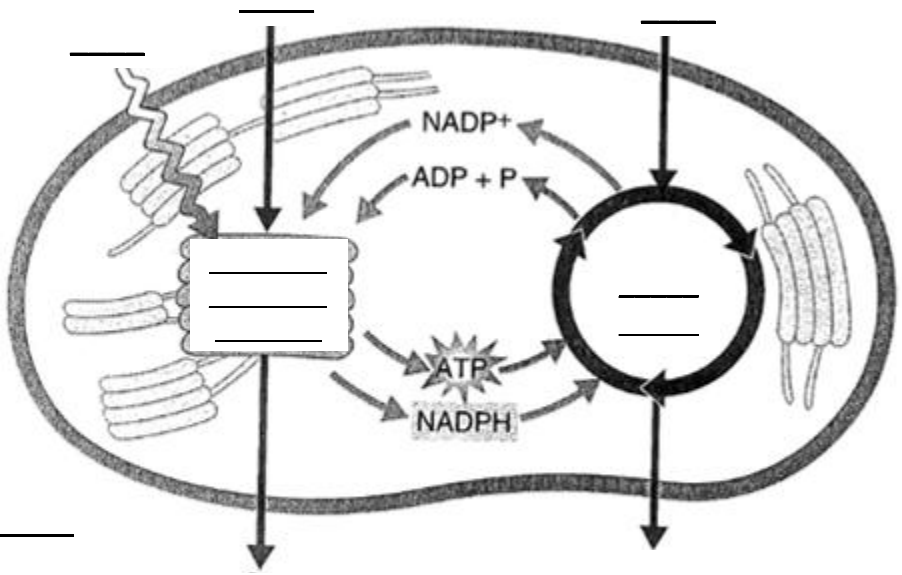
Photosynthesis:

- Photosynthesis is the process by which the energy of _____ is _____ into the energy of _____
- Photosynthesis occurs in the _____ of plants
- Light absorbing compound is a _____—pigments _____ some _____ of light and _____ others—the color our eyes see is the color that the pigment _____
- _____ is the pigment inside the _____ the absorbs light for photosynthesis
- General formula for photosynthesis:

carbon dioxide + water + light ⟶ glucose + oxygen

$6CO_2 + 6H_2O + light \longrightarrow C_6H_{12}O_6 + 6O_2$

- <u>Diagram</u>



<u>Summary:</u>

- _____ _____ _____—H_2O is _____ _____ and light energy is stored temporarily in inorganic energy carriers, _____ and _____
- _____ _____—energy is _____ from ATP and NADPH to the organic compound _____

Cellular Respiration: (2 kinds—Aerobic and Anaerobic)

- Cellular respiration is the process by which the energy of _____ is _____ in the cell to be used for life processes (_____, _____, _____, etc…)
- Cells require a _____ _____ ___ _____ for life processes but keep only a _____ _____ of _____ on hand. Cells can regenerate ATP as needed by using the _____ _____ ___ _____ like glucose.
- The energy stored in glucose by photosynthesis is released by _____ _____ and repackaged into the energy of ATP.
- Respiration occurs in ____ _____ and can take place either _____ ___ _____ _____ present.

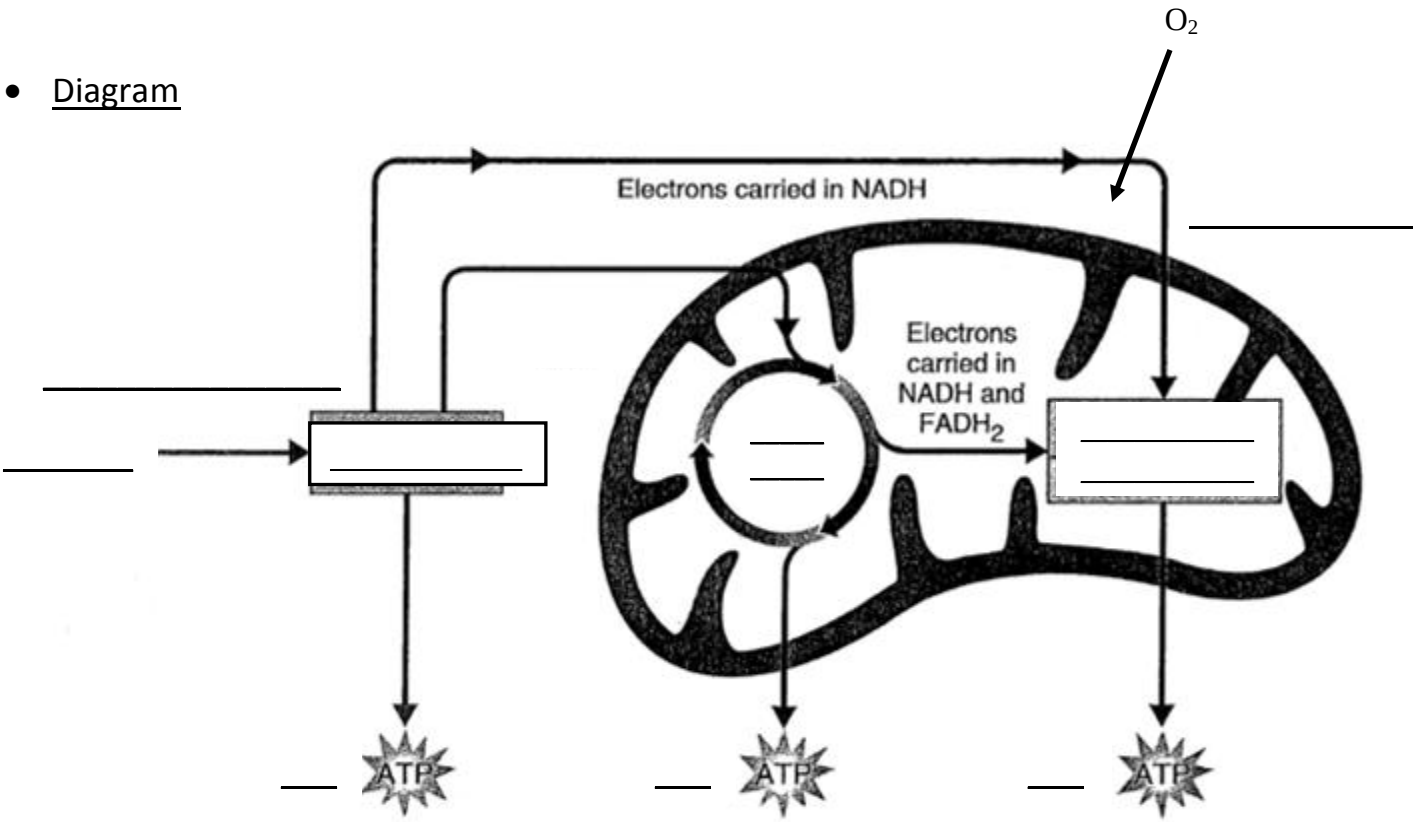
Aerobic Respiration: _____ _____

- Occurs in the _____ of the cell
- Total of _____ molecules produced
- General formula for aerobic respiration:

glucose + oxygen ⟶ carbon dioxide + water + energy

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6\,CO_2 + 6H_2O$ + **36 ATP**

- Diagram



Summary:

3 steps: 1st _____

2nd _____ _____

3rd _____ _____ _____ (ETC)

<u>Anaero</u>bic Respiration: occurs when ___ _____ is available to the cell (2 kinds: Alcoholic and Lactic Acid)

- Also called _____
- _____ _____ _____ _____ than in aerobic respiration
- _____ fermentation—occurs in _____ and _____

  Process used in the _____ and _____ industry—yeast produces CO_2 _____ during fermentation to make dough _____ and give bread its holes

  glucose ⟶ ethyl alcohol + carbon dioxide + **2 ATP**

- _____ _____ fermentation—occurs in _____ _____

  Lactic acid is produced in the muscles during rapid _____ when the body _____ supply enough _____ to the _____—causes _____ _____ in muscles

  glucose ⟶ lactic acid + carbon dioxide + **2 ATP**

- First step in anaerobic respiration is also _____

<u>Diagram</u>