

ENERGY TRANSFORMATION NOTES

PHOTOSYNTHESIS

ATP

Adenine Triphosphate

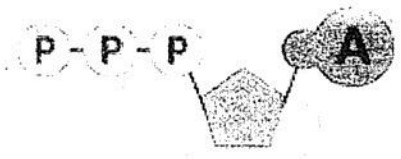
- adenine + ribose + 3 phosphates
- 1) ATP - storing molecule, only stores for a few minutes
- Source of all energy
- 2) • When one phosphate group breaks off, energy is released

vs.

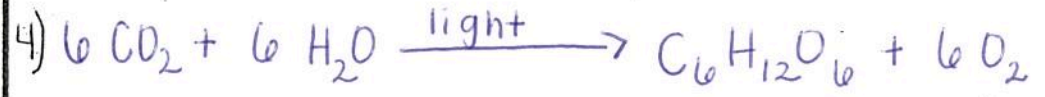
ADP

Adenine Diphosphate

- adenine + ribose + 2 phosphates
- 3) • Molecule resulting from ATP losing one phosphate (P)
- Another P may be added later



Formula for Photosynthesis:



Photosynthesis is the process in which energy from the 5) sun is used to convert 6) water and 7) carbon dioxide into 8) oxygen and 9) glucose (sugar).
 Photosynthesis occurs inside the 10) chloroplasts of plant cells.

There are 2 parts to the process:

- 1) Light-Dependent
- 2) Calvin cycle

Light Dependent Reactions: occurs in the 13) Thylakoid

- Inputs: Light and water
- Electrons pass along the 14) Electron Transport chain
- Products: NADPH, ATP, and oxygen (comes from water)
- The NADPH and ATP are then used for

Calvin Cycle (Dark Reactions): occurs in the 15) stroma

- Inputs: NADPH, ATP, and CO₂
- A series of reactions lead to production of 16) glucose

Chlorophyll: 17) Green pigment in cells that absorbs blue & red light energy

- moves energy to electrons that drive these reactions

Photosynthesis Song

A little bit of carbon dioxide

A little bit of water on the side

A little bit of sunlight all day long

Makes sugar (kiss)

And oxygen (breath)

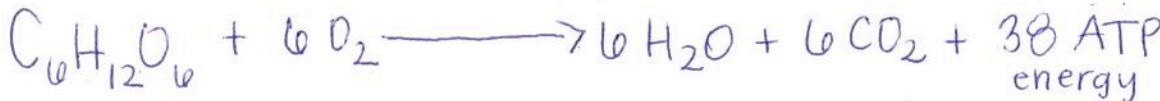
To keep us strong!

ENERGY TRANSFORMATION NOTES

CELLULAR RESPIRATION

Cellular Respiration is the process that releases energy by breaking down food when oxygen is present. This process occurs in the Mitochondria of a cell.

Formula for Respiration:



If oxygen is NOT present during this process, Fermentation occurs.
There are 2 types:

ALCOHOLIC Fermentation

- Forms Ethyl Alcohol and CO₂ as waste products
- What processes is it used for?
Wine + Beer Industry, Bread Dough Rise

LACTIC ACID Fermentation

- Produces lactic acid in Muscles when exercising without enough oxygen
- "FEEL THE BURN"

HOW DO PHOTOSYNTHESIS & RESPIRATION RELATE?

- Almost opposite processes.
- Photosynthesis produces glucose
- Respiration breaks down glucose

Photosynthesis uses CO₂, H₂O & releases O₂, C₆H₁₂O₆

Respiration releases CO₂, H₂O & uses O₂, C₆H₁₂O₆

