

Energetics Cheat Sheet

Autotroph-producer- makes own food through photosynthesis

Heterotroph-consumer- consumes others for food

All energy come from the **sun**, it is just transformed to a more usual form, found in bonds

Chemical bonds store energy, breaking these bonds releases energy that can be used by organisms

Autotrophs are vital to our survival, not only do they provide oxygen but they convert solar energy

Light- many wavelengths of different colors

Colors absorbed are not seen, colors reflected are what you see (green plants reflect green light)

Enzymes are used to speed up chemical processes

Photosynthesis- transforms inorganic molecules into an organic molecule

Raw Materials: Water from ground CO₂ from the air

Products: Glucose (C₆H₁₂O₆) and O₂ is released

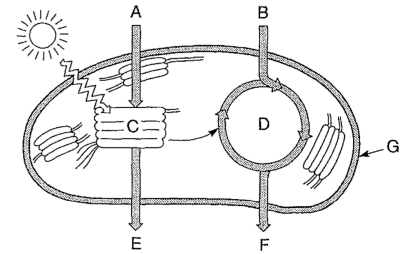
Occurs: In the chloroplast-2 part reaction

Light dependent- (photolysis) H₂O is split by sunlight releasing Hydrogen, Oxygen and ATP

Light independent- (Calvin cycle) Hydrogen is combined with CO₂ from the air to make glucose

The ATP produced in the light reaction fuels the light independent reaction

Photosynthesis can be regulated by the Guard cells, they control gas exchange in the leafs



Respiration- transforms unusable energy into usable energy (glucose to ATP)

Raw Materials: Glucose from food and O₂ from air

Products: ATP, CO₂ and water

Occurs: cytoplasm and mitochondrion - 3 part reaction

Glycolysis-(cytoplasm) the splitting of glucose into ATP and pyruvate

Kreb's cycle- Acetyl CoA is transformed into ATP, CO₂ and NADH

Electron transport chain- NADH is combined with O₂ to produce ATP and H₂O

ATP is used for the life functions- therefore all living things must preform respiration

Aerobic respiration- uses oxygen (cellular respiration) – 36 ATP

Anaerobic respiration- without oxygen (fermentation)– 2 ATP

Animals- respiration

Plants- photosynthesis and respiration

ADP + P = ATP (dead battery to charged battery)

H, C, O are all recycled through their respective cycles.

Yeast preform alcoholic fermentation- this produces alcohol and CO₂

Yeast can be used to make bread rise because CO₂ production forms bubbles in the dough

Yeast can be used to make alcohols like beer because it creates ethanol and CO₂ for carbonation

The 2 processes above only occur without the presence of oxygen.

Contrary to yeast, our muscle cells produce lactic acid when they are oxygen deprived.

