Enzymes

Chemical Properties: Enzymes are proteins that help speed up chemical reactions in the human body without them being consumed or altered by the reaction. Enzymes have active sites in which the reactions they catalyze take place.

Enzymes jobs: Enzymes increase the rate of reactions in biological organisms.

Environment: Changes in pH and temperature to unideal condition will cause enzymes to denature. The high temperature cause harsh movements that cause the enzymes structure to unfold and change. pH can change the bonds between amino acids within the protein also causing the enzyme to change shape. A change in shape means a change in function, causing enzymes to not function anymore.

Energy

Role:	Energy is needed in organisms to grow and reproduce as well as maintain their structure and respond to their environments. Energy is mainly used in the form of glucose and ATP

Survival

Cells have many different kinds of molecule which give organisms a better chance of survival and reproduction in certain environments.

Energy in Animal Cells

Glycolysis:	A series of reactions that extract energy from glucose by splitting it into two three-carbon molecules called pyruvate(breaking of glucose).

Energy in Animal Cells (cont)

	Glycolysis does not require oxygen to happen and takes place in the cytosol of a cell. The net products of this reaction is 2 ATP (4 are produced but 2 are used) and two molecules of NADH, as well as two pyruvate which is then either used in fermentation or cellular respiration.
Fermentation:	Fermentation is the process that takes place when oxygen is not present in the cell. It allows glucose to be continuously broken down to make ATP due to the recycling of NADH to NAD+.
	Fermentation is the reduction of pyruvate to form lactic acid and the oxidation of NADH to form NAD+. The elctrons form NADH are used to reduce pyruvate to lactic acid.
Cellular Respiration:	Cellular respiration happens if oxygen is present in the cell. Pyruvate will enter the mitochondria and go through the Krebs Cycle.

Energy in Animal Cells (cont)

Pyruvate is transformed into an acetyl group in the mitchondria and is activated by coenzyme A which results in Acetyl CoA. Acetyl CoA is oxidized by NAD+ and FAD which makes NADH and FADH2 along with CO2 excreting the mitochondria. ADP and inorganic phosphate come together to make ATP as well. NADH and FADH2 are used in the ETC to create a proton gradient which is then used by ATP synthase to make ATP. The end product of cellular respiration is water carbon dioxide and ATP(around 38).

Photosynthesis

Photosynthesis:	The process where plants use sunlight, water, and CO2 to create energy in the form of sugar
	Photosynthesis takes place in the thylakoid of chloroplasts. Light shines onto the chlorophyll in PSII, causing electrons to get excited. The electrons then go throught the ETC causing a proton gradient to be made, and protons to enter the thylakoid. The remaining electron who has lost most of its energy is put into PSI and is then energized again by light shining onto the chlorophyll. This charged electron is then used to turn NAD+ into NADH. The protons that were pumped into the thylakoid are used to make ATP through the ATP synthase enzyme.

Photosynthesis (cont)

Calvin Cycle: CO_2 and RuBP are combined together due to the enzyme Rubisco to make two PGA. The ATP and NADPH created from the thylakoid are used to reduce PGA into PGAL. One cycle will create 12 PGALS, but 10 are recycled back into the cycle to make RuBP so that the cycle keeps running. The other tow PGAL come together to make sugar. The main purpose of this cycle is to make energy in the form of sugar for the cell.