Cells
Cell Energy

Name_____

Topics	Notes, Diagrams, Drawings
Energy	Energy for living things comes from **food**. Originally, the energy in food comes from the **sun**.
Autotroph	Organisms that use **light energy** from the sun to produce food—**autotrophs** (auto = self)
Examples	Plants, some microscopic organisms (bacteria, blue-green algae, protists)
Heterotroph	Organisms that **CANNOT** use the sun's energy to make food—**heterotrophs**
Examples	Animals, most microorganisms
ATP	Cells usable source of **energy** is called **ATP** ATP stands for **adenosine triphosphate**

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Photosynthesis	The process of capturing light energy from the sun and changing it into food
Chlorophyll	Inside the chloroplast, the chlorophyll absorbs the sun's light. It absorbs all the colors except green; chlorophyll REFLECTS green light.
Equation	$6CO_2 + 6H_20 + \text{Light Energy} \rightarrow C_6H_{12}0_6 + 6O_2$
CO_2	CO_2 is carbon dioxide. This is the gas we breath out. C is the chemical symbol for carbon. O is the chemical symbol for oxygen. "Di" means two. There are 6 carbon dioxide molecules in the reaction.
H_20	H_2O is water. H is the chemical symbol for hydrogen. There are 6 water molecules in this reaction.
Glucose ($C_6H_{12}O_6$)	The first product (what we get) is 1 molecule of sugar. A molecule of sugar is made up of 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms.
0_2	O_2 is pure oxygen. Photosynthesis maintains the level of oxygen in the atmosphere and supplies most of the energy for life on earth.
Stage 1	In the first stage, energy from sunlight is captured in the green pigment chlorophyll, which is found in the organelles known as chloroplasts. Water that entered the chloroplasts is split into hydrogen atoms and oxygen atoms. The oxygen is given off as a waste product and the hydrogen is used in the next stage.
Stage 2	In Stage 2, hydrogen and carbon dioxide, which has entered the plant through small openings on the underside of the leaves, combine to form sugars. One important sugar is glucose.

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Cellular Respiration	The process of producing ATP in the cell from oxygen and glucose; releases carbon dioxide and water
Equation	$C_6H_{12}0_6 + 6O_2 \rightarrow 6CO_2 + 6H_20 + ATP$
Stage 1	The first part of cellular respiration takes place in the cytoplasm (glycolysis) The glucose is broken down into smaller molecules. A few ATP molecules are made, but more are produced during the second step.
Stage 2	The second part of cellular respiration takes place in the mitochondria in eukaryotic cells. The smaller molecules made by glycolysis are broken down, and many ATP are made. The ATP are used to power all cellular processes.
Fermentation	Fermentation is a reaction cells use to obtain energy from food when oxygen levels are low. Fermentation takes place in the cytoplasm, and less ATP is made than in the mitochondria.
Alcoholic	• Used by some types of bacteria and yeast • Waste products are ethanol and carbon dioxide • Many types of bread are made using this, and the carbon dioxide released makes the bread rise
Lactic Acid	• Glucose is changed into ATP • Waste product is lactic acid • This is how cheese, yogurt, and sour cream are produced