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Living Environment  
December 25th 2018

### **Enzymes:**

- Proteins that speed up chemical reactions in the cell.

#### **Aids in..**

Digestion (Breakdown) Starch into glucose

Synthesis (Building up)

Cellular Respiration

Photosynthesis (Turning food into energy for plants)

#### **Names:**

- Specific to the molecule
- Usually ends in -ase
- Sugars end in -ose

#### **More on Enzymes:**

- When reaction is complete, products release and the enzyme is free to work again. It is reusable!
- Enzymes create one product then detach.
- Can bind more than one reactant at a time!

#### **Enzyme Reaction Rates and Factors that can affect Enzymes:**

- Enzyme shape: If altered ( ***DENATURED!***) it cannot function → decrease in reaction rate (slower)
- Denatured when not in optimum pH or temp. Therefore, it cannot mold with a substrate/s
  1. **Temperature:** Enzymes have optimum temperatures to function well. (Human body 36 degrees celsius and 98.6 degrees fahrenheit.
  2. **pH:** Optimum pH = Human mostly pH 7  
Enzymes in stomach = pH 2,3  
Intestines = pH 8

**Closer to optimum reaction rate and or temp. = Faster reaction rate**

#### **Vocabulary:**

Subrates = The reactants

Active site = Where the substrate/s bond to the enzyme

Form enzyme = Substrate complex

Induced fit = Mold to substrate

### **Photosynthesis:**

The process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.

### **Structures of a leaf:**

- Chloroplasts = Site of photosynthesis
- Leaf = Releases oxygen (O<sub>2</sub>) and takes in Carbon Dioxide (CO<sub>2</sub>)
- Roots = Collects water and nutrients
- Stem = Brings water and nutrients up
- Guard cell = Mostly at the bottom of the leaf and causes stomate or stoma (pore) to open and close.

### **Purpose/function:**

The primary function of photosynthesis is to convert solar energy into chemical energy and then store that chemical energy for future use.

### **Equation:**

Reactants → Products

Light energy

Carbon Dioxide + Water → Glucose + Oxygen

Takes place inside chloroplasts!

### **Life functions:**

- **Respiration** (Aerobic VS. Anaerobic)

**Aerobic:** Uses oxygen

**Anaerobic:** Does not use oxygen. Getting energy from food

- **Regulation** (Control and Coordinate)

**Control:** Stays the same.

- **Reproduction** (Asexual VS. Sexual)
- **Excretion** (Waste)

**Excretion:** The process of eliminating or expelling waste matter.

- **Growth**
- **Nutrition** (Autotrophic VS. Heterotrophic)

**Autotrophic:** Makes its own food.

**Heterotrophic:** Where a living thing must ingest (take in) its food

- **Transport** (Circulatory)
- **Synthesis** (The process by which smaller, simple substances are combined chemically to form larger, more complex substances)

If a living thing has all 8 of these life functions, it is called an ORGANISM!

When we refer to all of the life functions of an organism, we are referring to its

**METABOLISM**--the total of all the life functions required to sustain life (to stay alive)

### **Digestive system:**

#### **Function:**

Breaks down food into nutrients, which the body uses for energy, growth, and cell repair

#### **Types:**

- **Mechanical digestion:** Large physical pieces of food being broken down by grinding, cutting, and tearing.
- **Chemical digestion:** Large insoluble (can't dissolve) nutrients being broken down into smaller soluble molecules with the help of enzymes.

**Accessory structures:**

- Salivary glands - Produce saliva
- Pancreas - Enzymes and digestive juices, are secreted by the pancreas
- Liver - Produces bile
- Gallbladder - Stores bile

**Order of digestion through the organs:**

1. Oral cavity (Mouth)
2. Esophagus
3. Stomach
4. Small intestine
5. Large intestine
6. Rectum

**Microscope:**

**Practice naming the parts using this online game:**

<https://www.sporcle.com/games/MacHater/parts-of-a-microscope>



**Measurement:**

**Magnification:**

Image size divided by actual size = Magnification

**How to find it:**

1. Use ruler to measure length of the cell in mm
2. Then plug in the actual size (will be provided)
3. Use calculator to solve

Remember to add X to the end of the number answer because it is the magnification!

**Extra!**

**If they ask for actual size instead:**

Imagine size divided by magnification

**ATP:**

**What is it?:**

- ENERGY!
- High energy molecules that cells run on
- Needed for life functions
- Energy is stored in ATP bonds
- Bond must be broken to release energy

**Where is it produced:**

In the mitochondria

**Used:**

In aerobic cellular respiration.

All organisms use cellular respiration and they need ATP.

**Characteristics of all living things:**

All living things carry out these life processes:

1. Respiration (Aerobic vs. Anaerobic)
2. Regulate (Control and Coordinate)
3. Reproduce (Asexual vs. Sexual)
4. Excretion (Solid waste)
5. Growth
6. Nutrition (Autotrophic vs. Heterotrophic)
7. Transport (Ingestion, Digestion, Egestion)
8. Synthesis (Small to large)

**Plant Anatomy:**

Leaf = Release oxygen and take in Carbon Dioxide

Roots = Collect water and nutrients

Stem = Brings water and nutrients up

Guard Cell = Mostly at the bottom of the leaf and causes stomate (pore) to open and close.

- Chloroplast captures light and uses it to turn water and Carbon Dioxide to sugar and oxygen = Photosynthesis
- They use SOLAR ENERGY to create food for themselves
- Oxygen is released into the environment to be used for cellular respiration.
- Water = food = energy

**Immune System:**

**Vocabulary words:**

- Antigen
- Pathogen = Infectious agent that causes disease or illness to host.
- White Blood Cells
- Macrophages/Phagocytes = Engulfs pathogens
- Lymphocytes = Recognize antigens
- B-cells = Produces specific antibodies (Plasma cell and memory cell)

- T-cells = Kills pathogens or marks them for destruction (Killer,Helper,Memory)

**Lines of defences:**

First line:

-Keep them out! Skin, secretions (Tears, Saliva, Mucus)

Second line:

Inflammatory response.

-Macrophages come to area.

-Body temperature increases (fever)-kills bacteria

Third line:

-Pathogens have reached your body cells.

-Lymphocytes and antibodies are created.

- You can get sick through: open wounds, breathing, ingesting, may get in your mouth, any cuts, and nostrils.
- Macromolecule = Protein
- Clump pathogens together = Phagocytes engulf
- Specific to the antigen: Antigen "perfect fit"

# Living Environment Study Sheet #2

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## Homeostasis:

Homeostasis is the ability of a living thing to adapt/adjust to its internal environment.

## Cell Theory:

- All living organisms are made up of one or more cells.
- The cell is the basic unit of life.
- All cells come from existing cells.

## Prokaryotic VS. Eukaryotic:

Prokaryotic = A unicellular organism that does not have a nucleus or mitochondria.

Eukaryotic = Opposite of a prokaryotic organism

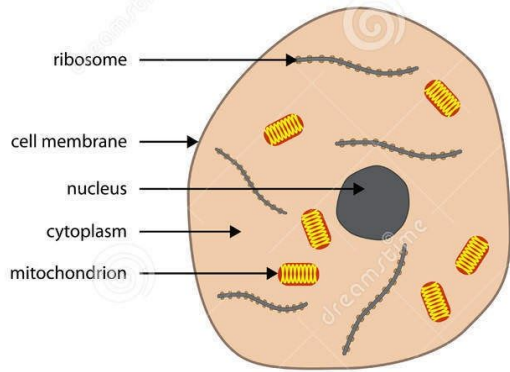
## Plant vs. Animal cell:

Plant cell: Has chloroplasts, cell wall, membrane

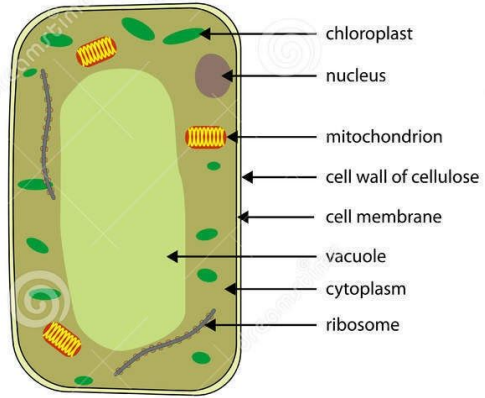
Animal cell: Has a membrane

(Differences)

Animal Cell



Plant Cell



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