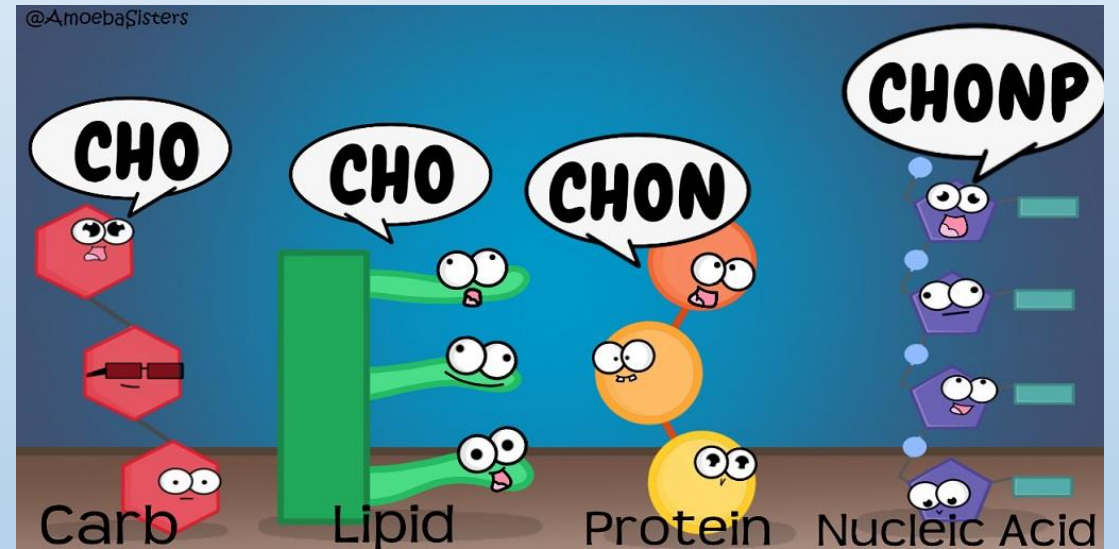


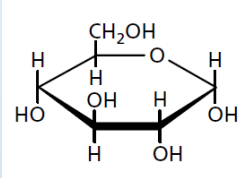
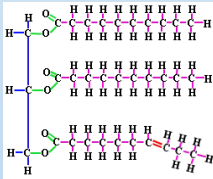
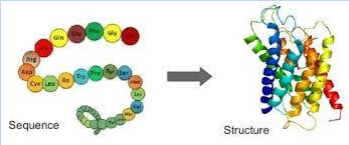
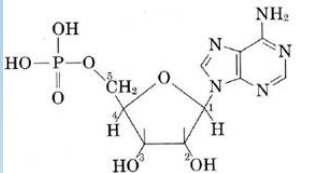
# Semester Exam Review

# Discuss- Biomolecules

Biomolecule Building Blocks <small>@AmoebaSisters</small>			
Nucleic Acid	Carbohydrate	Lipid	Protein
<small>@AmoebaSisters</small>			

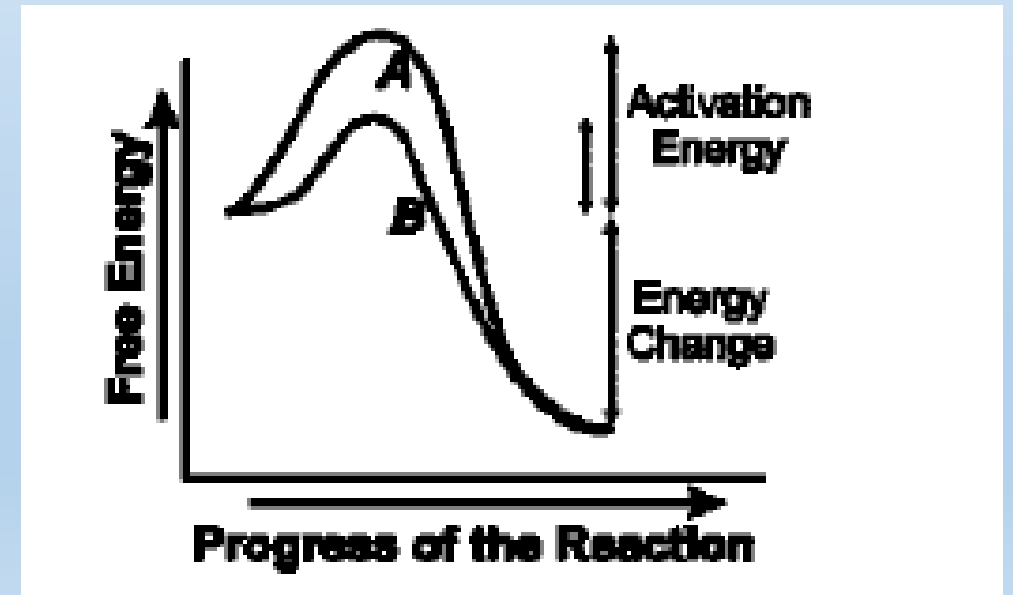
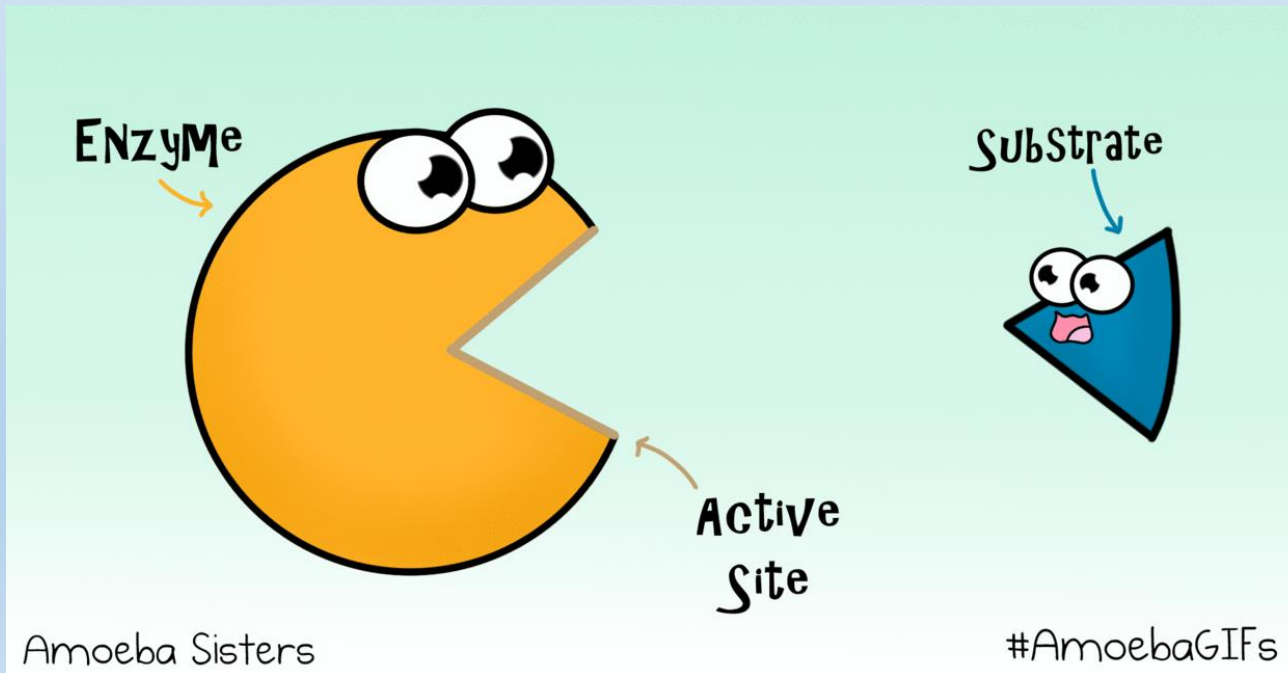


# Review Sheet

Biomolecules	Function	Elements	Examples	Monomer	Structure
Carbohydrates	Energy source (fast energy, not long lasting)	CHO	Bread Sugar Pasta Glucose( photosynthesis)	Monosaccharide Memory clue: Longest word with longest word	
Lipids	Energy source (long lasting, think hibernating bear)	CHO	Fat Oil Waxes	Fatty Acid Memory clue: Don't put your lipids on my fatty acid.	
Proteins	Makes up an organism Enzyme	CHON	Meat Chicken Fish Beans	Amino Acids Memory clue: Pro-Amino	
Nucleic Acids	Genetic information	CHONP	DNA RNA	Nucleotide Memory clue: N with N	

# Discuss- Enzymes

- Special type of... (what biomolecule?)
- Can be affected by PH or temperature (denatured)
- Work by lowering...?



# Review Sheet

What is the function of enzymes?

The function of an enzyme is to speed up chemical reactions by lowering activation energy of a reaction .

Label the parts of the picture below.

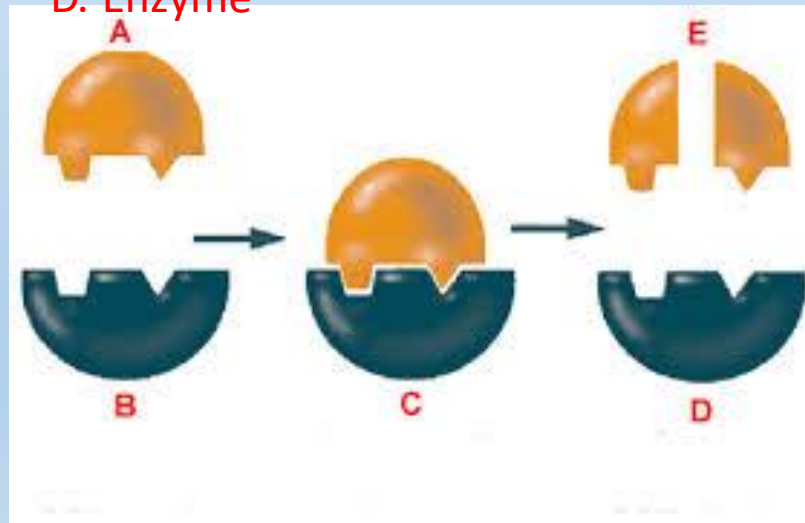
A: substrate

E: products

B: enzyme

C: enzyme/substrate complex

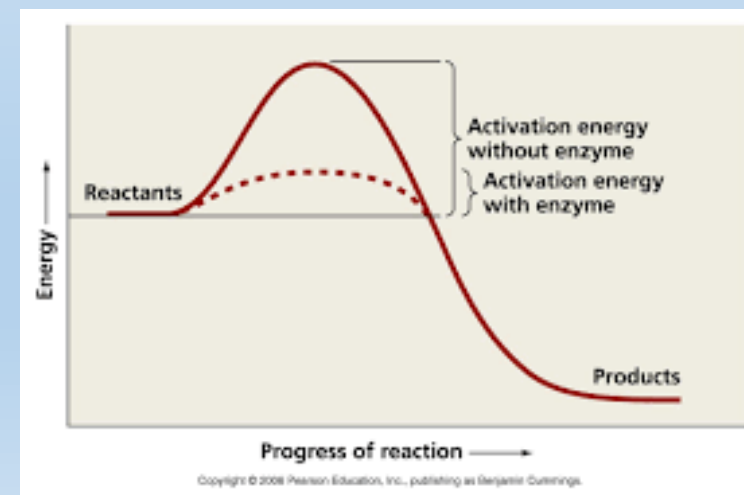
D: Enzyme



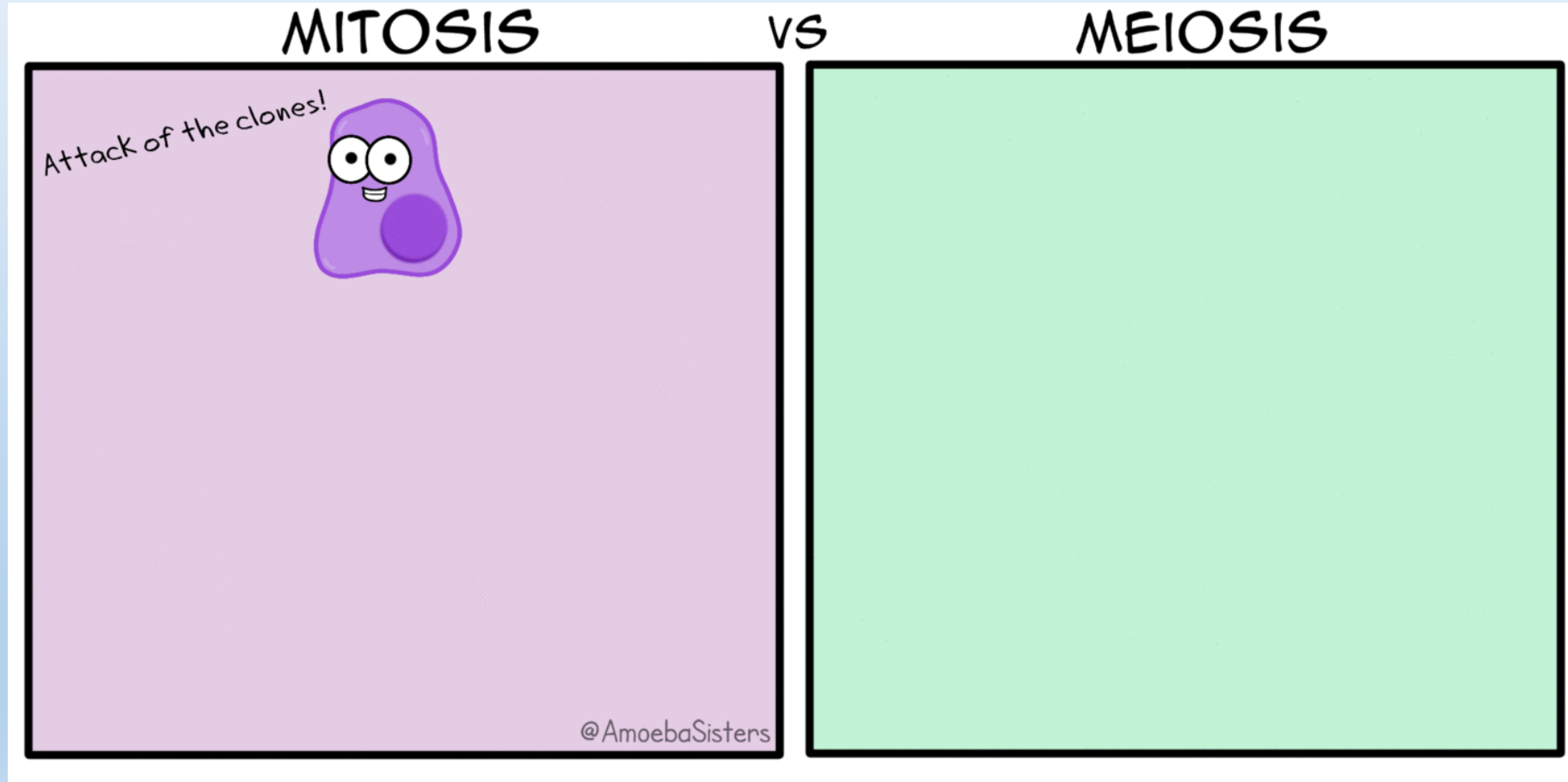
Explain how enzymes are affecting the graph below.

The graph shows a reaction with an enzyme and one without.

The reaction with the enzyme had lower activation energy than the one without.



# Discuss: Mitosis v. Meiosis



# Review Sheet

	Mitosis	Meiosis
Type of cells	Somatic Cells (body cells: muscle, skin)	Gamete (sex) cells Sperm: males Egg: Female
Purpose of reproduction	Repair and growth	Sexual reproduction
Type of reproduction	Asexual	Sexual
# of cells produced	2	4
Diploid or Haploid cells?	Diploid	Haploid
Identical or Different cells?	Identical Daughter cells	Different

# Review Sheet

What must occur during the S phase of interphase?

DNA must replicate

---



# Discuss: DNA v. RNA

**DNA** (Deoxyribonucleic Acid)

Deoxyribose (sugar)

Generally Double-stranded\*

\*few exceptions

**RNA** (Ribonucleic Acid)

Ribose (sugar)

Generally Single-stranded\*

\*few exceptions

@AmoebaSisters

● Adenine  
● Thymine  
● Cytosine  
● Guanine

● Adenine  
● Uracil  
● Cytosine  
● Guanine

What are the similarities and differences between DNA & RNA?

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# Review Sheet

## Similarities

- Both nucleic acid
- Both contain adenine, cytosine, guanine
- Both hold genetic information

## Differences

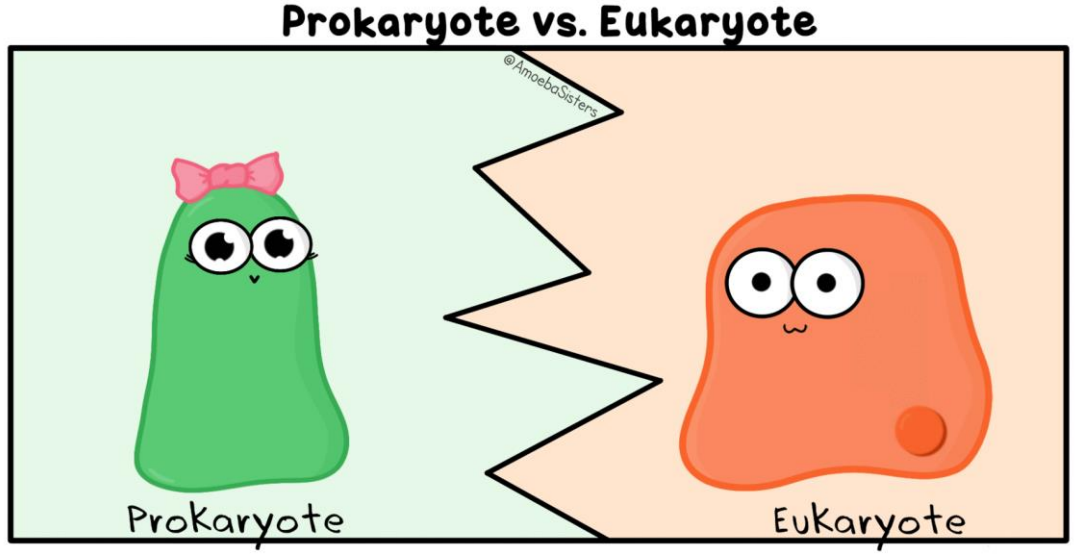
- DNA: double stranded
- RNA: single stranded
- DNA: contains thymine
- RNA: contains uracil
- DNA: sugar is deoxyribose
- RNA: sugar is ribose

# Review Sheet

What is a codon? What do you use it for?

Three nucleotides that will be read by a ribosome to build a certain amino acid (used in protein synthesis) (UAA, AUG)

# Discuss: Prokaryotic v. Eukaryotic



**PROKARYOTES**  
Pro- = "Before"    Karyo- = "Nucleus"

**EUKARYOTES**  
Eu- = "True"    Karyo- = "Nucleus"

Archaea

Bacteria

Fungi

Protists

Animals

Plants

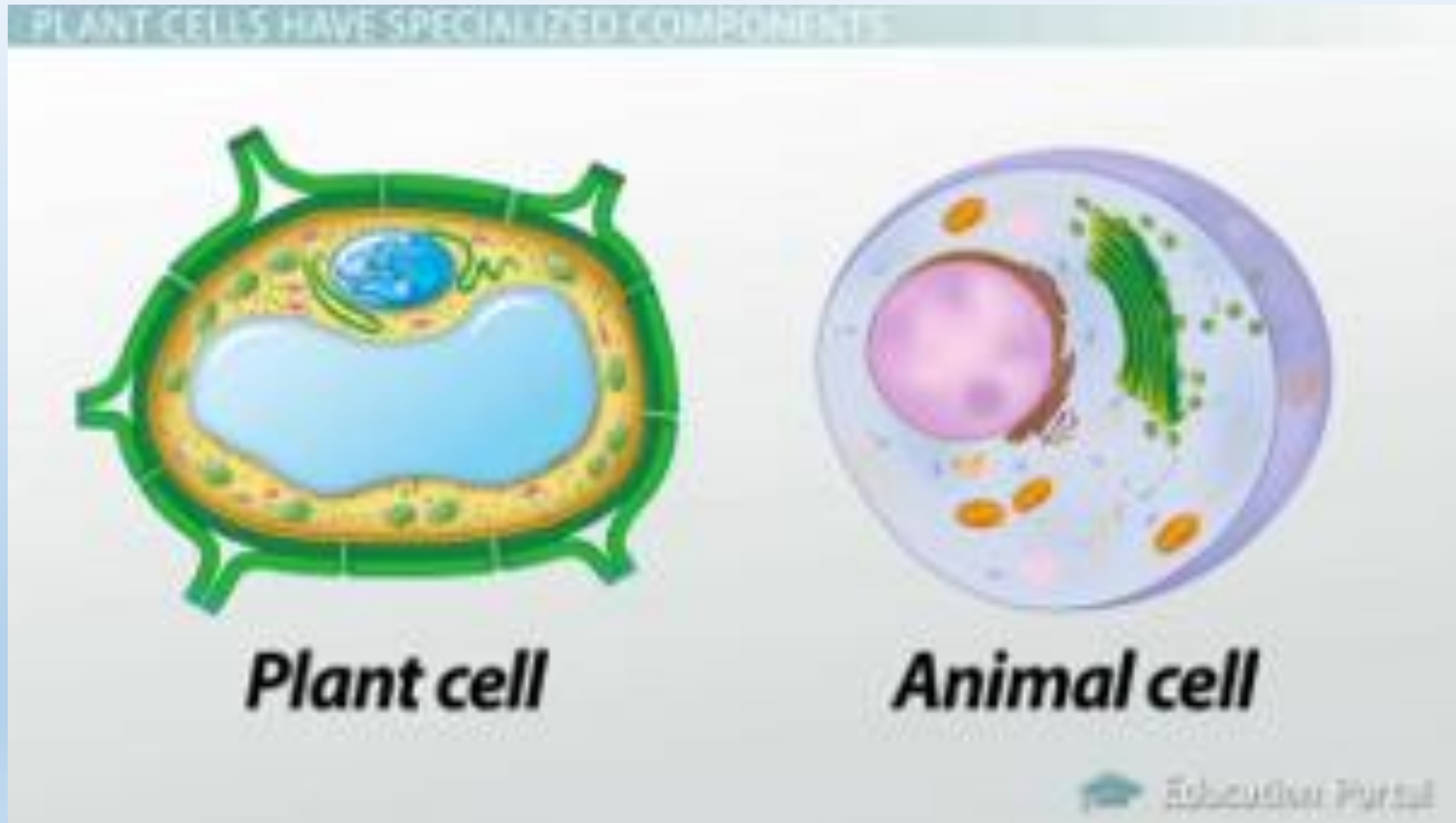
@AmoebaSisters

A 2x2 grid of organisms. The top-left cell shows a blue diagonal line with three small white circles, labeled 'Archaea'. The top-right cell shows a brown mushroom with two black fungi-like structures, labeled 'Fungi'. The bottom-left cell shows a green, rod-shaped organism with a nucleus, labeled 'Bacteria'. The bottom-right cell shows a green, bean-shaped organism with a nucleus, labeled 'Protists'. To the right of the grid, there are two more cells: the top one shows a green frog and a brown snail, labeled 'Animals'; the bottom one shows two blue flowers, one with a happy face and one with an angry face, labeled 'Plants'. In the center, the text 'PROKARYOTES' is written in purple, 'EUKARYOTES' in blue, and 'VS' in black. Below 'PROKARYOTES' are the definitions 'Pro- = "Before"' and 'Karyo- = "Nucleus"'. Below 'EUKARYOTES' are the definitions 'Eu- = "True"' and 'Karyo- = "Nucleus"'. A vertical watermark '@AmoebaSisters' is on the left side of the grid.

# Review Sheet

Prokaryote	Both	Eukaryote
Have no nucleus (pro rhymes with no)	Both contain genetic material in the form of DNA	Has a nucleus (EU rhymes with DO)
No membrane bound organelles	Both are living	Has membrane bound organelles
Includes bacteria	Both are cells	Includes plants, animals, protists, and fungi
Simple type of cell	Both contain ribosomes	Complex cell
Smaller	Both contain cytoplasm	Larger
Single celled only	Both contain cell membrane	Multi-cellular (some single celled)

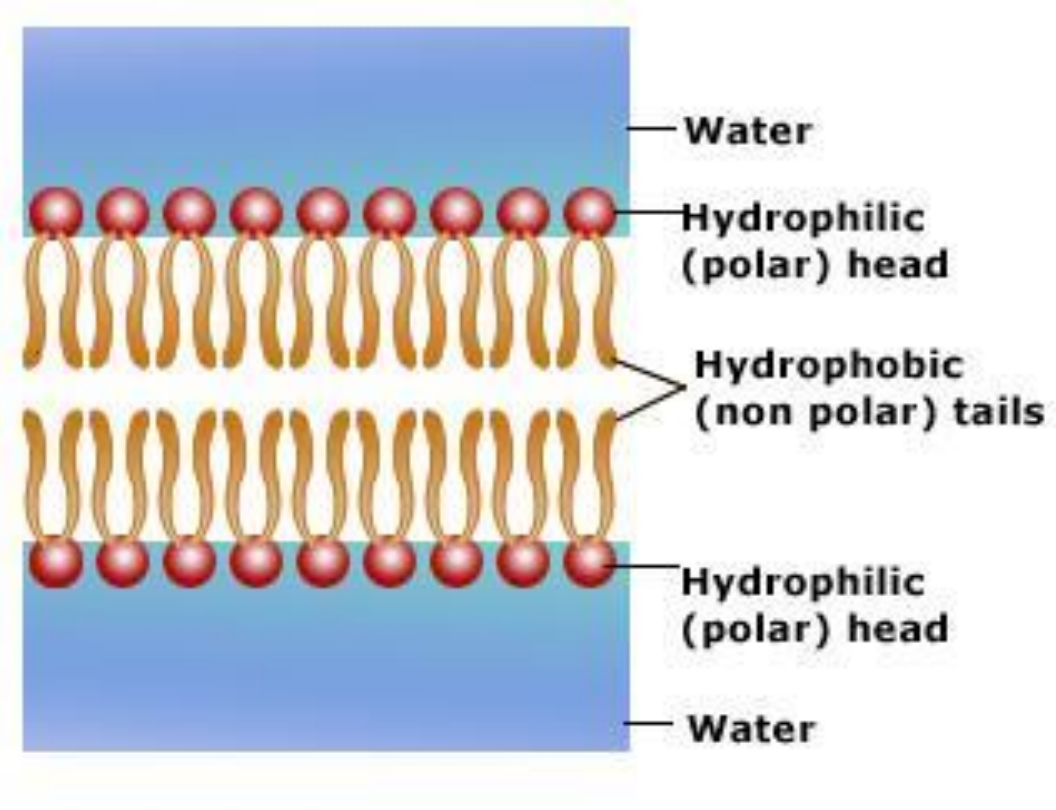
# Discuss: Plant v. Animal Cells



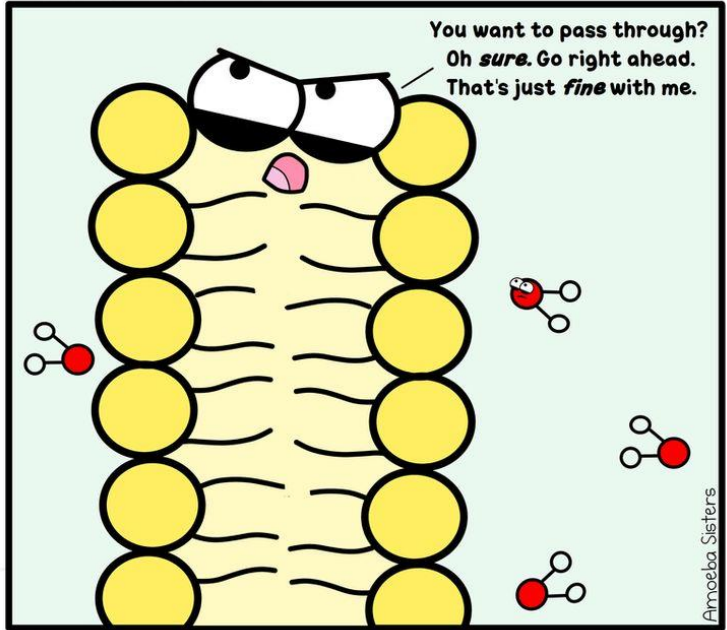
# Review Sheet

Animal	Both	Plant
No cell wall	Eukaryotic	Contains cell wall
circular	Multicellular	Contains chloroplast
Does not go through photosynthesis	Cell membrane	larger vacuole
heterotrophic : does not make its own food	Mitochondria	Rectangular
	Ribosome	Makes its own food through photosynthesis Autotrophic

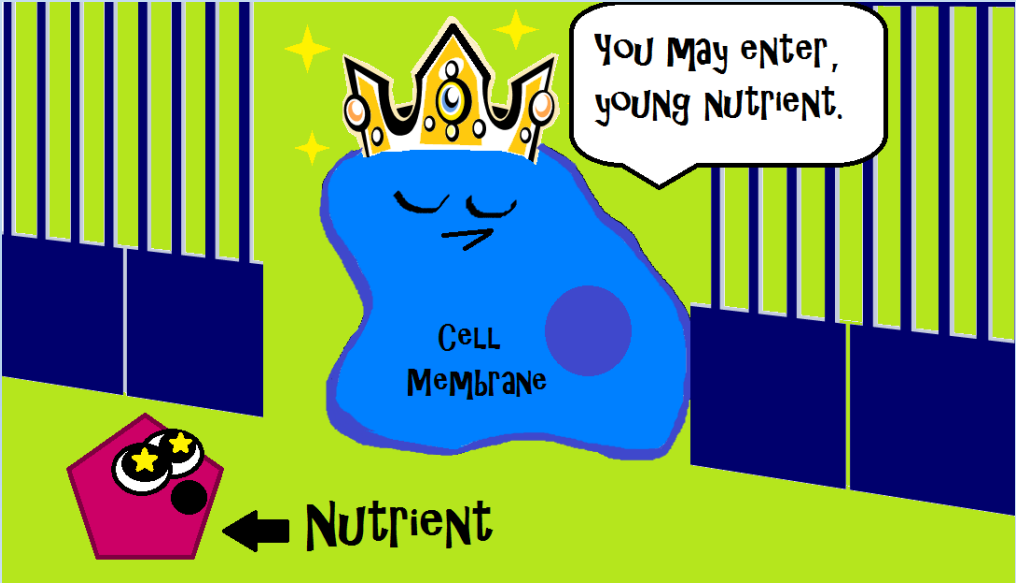
# Discuss Cell Membrane



Paramecium Parlor



**Semipermeable membranes:**  
putting the "passive" in passive transport.





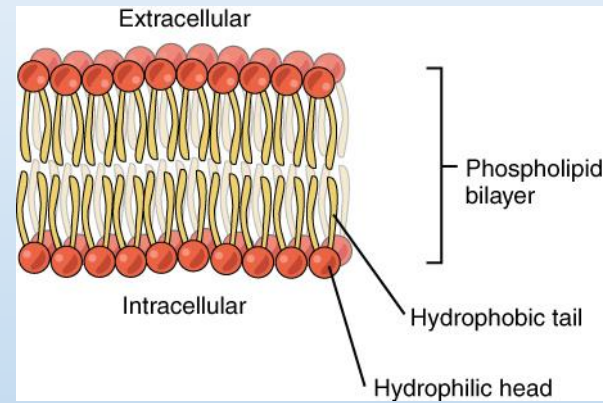
# Review Sheet

- Cell Membrane -

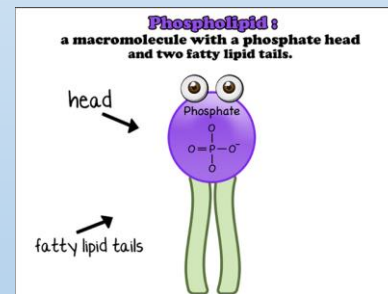
**Determines what comes in and out of the cell.**

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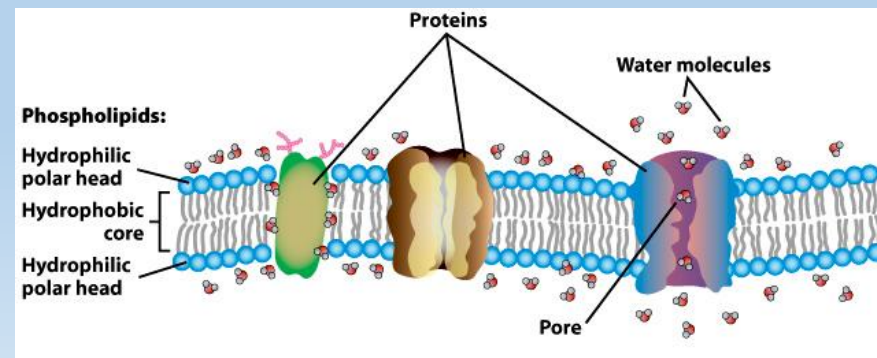
- Lipid bilayer (draw →→→)



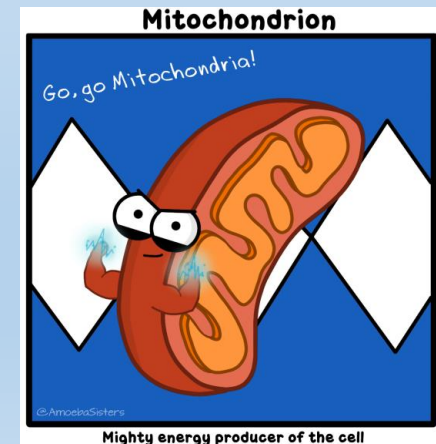
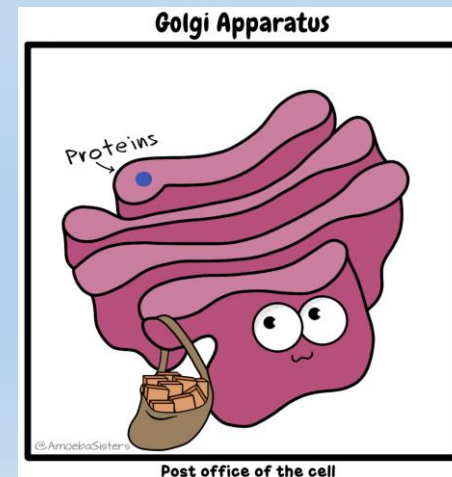
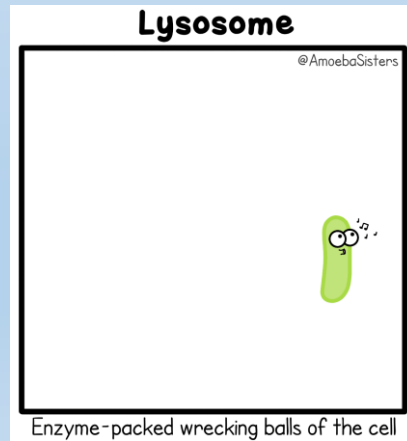
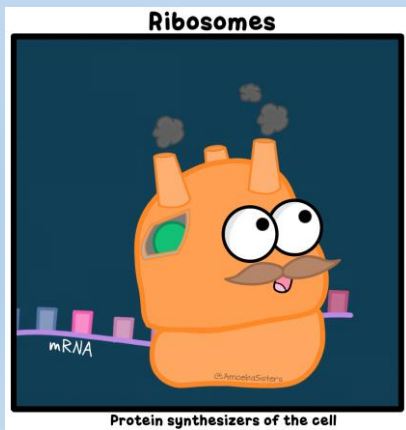
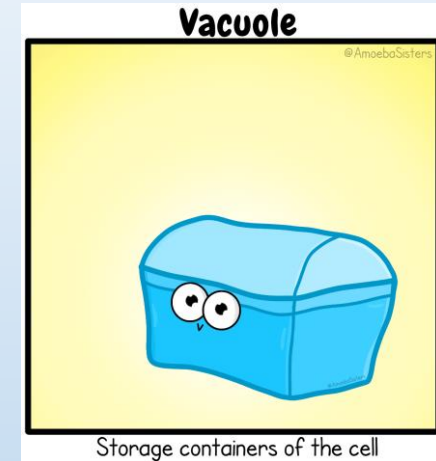
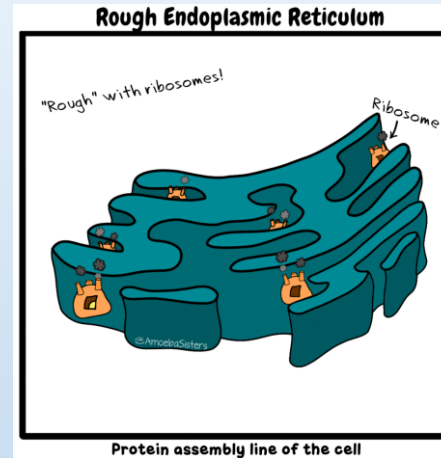
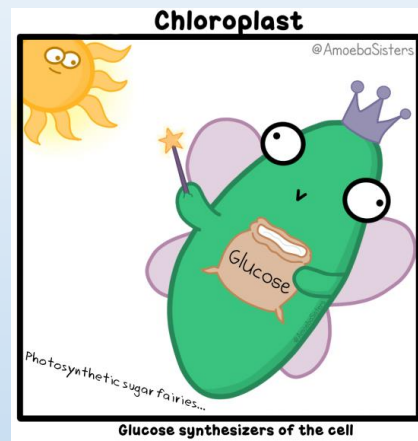
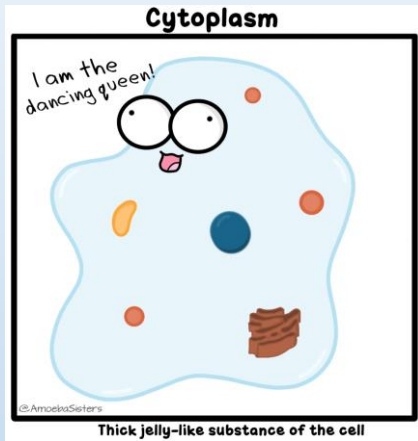
- Phospholipid



- Protein



# Discuss Organelles



# Review Sheet

- Organelle –

The parts that make up a cell examples are nucleus, mitochondria, lysosomes only found in eukaryotic cells.

- Cell Wall –

Found in plant cells only, outer layer providing structure and support.

- Chloroplast -

Found in plants only, traps sunlight needed for photosynthesis. Location of photosynthesis (where glucose is made).

- Chlorophyll -

Green pigment that absorbs sunlight (in plants only) Needed for photosynthesis

- Cytoplasm -

Jelly like substance (aqueous) that fills all cells (prokaryotic and eukaryotic)

- Endoplasmic Reticulum -

Can be rough (with ribosomes) or smooth, network needed for protein transport.

# Review Sheet

- Homeostasis -

To maintain balance (temperature, waste, PH)

---

- Carrier molecule (protein) is used for:

Protein that aids in moving larger particles in and out of the cell membrane.

---

- Endocytosis -

EN (ENTER) substances moving into the cell. Type of active transport.

---

- Exocytosis -

EX (exit) substances are expelling, exiting, leaving the cell. Type of active transport.

---

# Review Sheet

- Golgi body -

Packages proteins for transport.

- Nucleus -

Only found in eukaryotic cells. Holds genetic information in the form of DNA.

- DNA – Nucleic Acid

- Ribosomes -

RIB= meat, meat is protein. Ribosomes make protein.

- Mitochondria -

Location of cellular respiration. Provides power to the cell in the form of ATP (ENERGY)

- Vacuole -

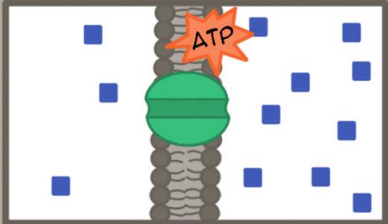
Storage for water and nutrients for the cell (much larger in plant cells than animal cells)

# Discuss: Types of Transports

## CELL TRANSPORT @AmoebaSisters

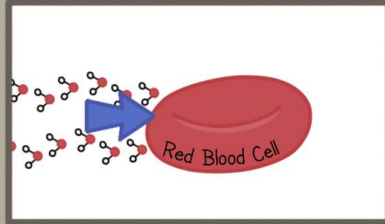
Requires Energy

Active Transport

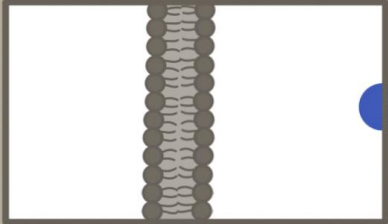


Does Not Require Energy  
(Passive Transport)

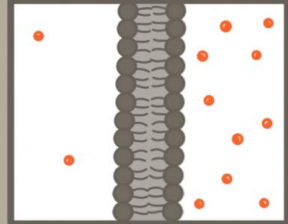
Osmosis



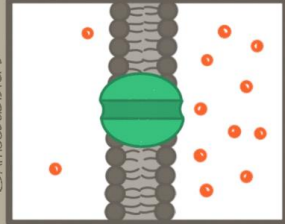
Bulk Transport (ex: Endocytosis)



Diffusion

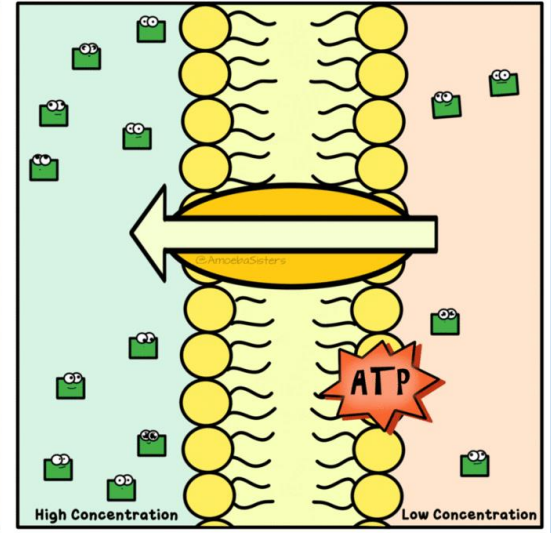
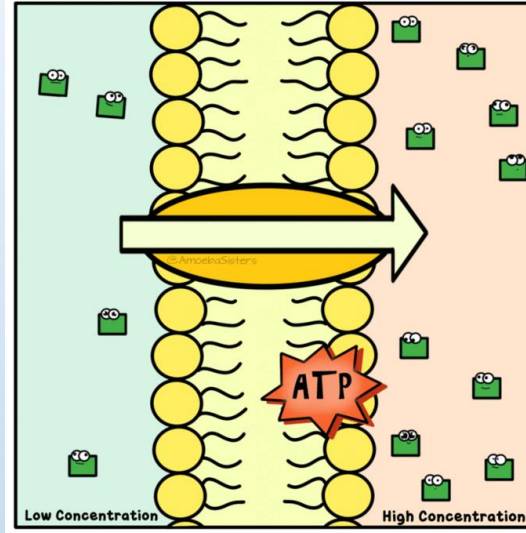


Facilitated Diffusion



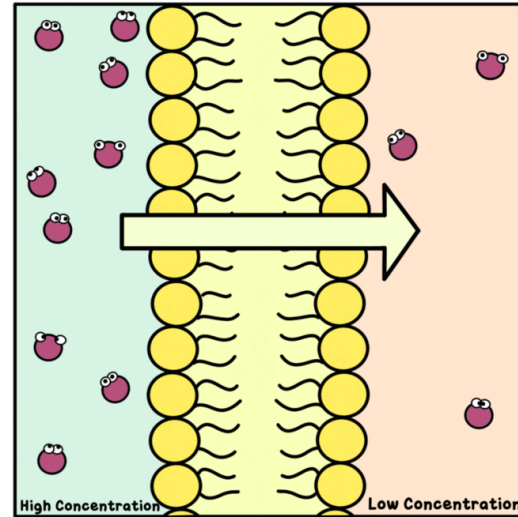
## Active Transport

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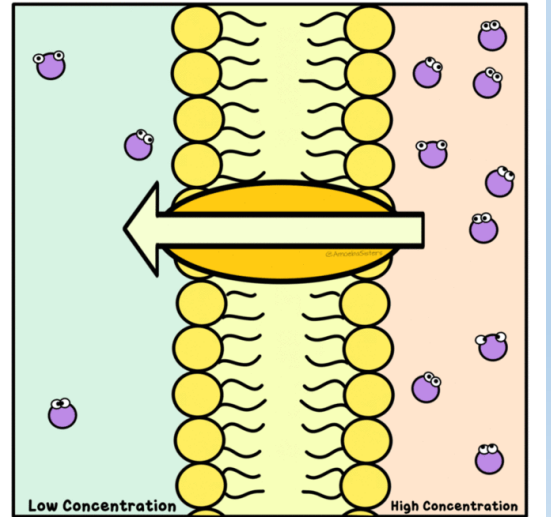


## Passive Transport

Diffusion



Facilitated Diffusion



# Review Sheet

Passive Transport	Both	Active Transport
Does not require energy	Moves particles in and out of the cell	Requires energy in the form of ATP (ENERGY)
Moves with concentration gradient (rolling a ball DOWN a hill)	Maintains homeostasis	Moves against concentration gradient (pushing a ball uphill)
High to low concentration	Can use proteins to help move larger particles in and out of the cell.	Low to high concentration
Includes osmosis, diffusion and facilitated diffusion		includes endocytosis and exocytosis

# Review Sheet

- Diffusion – movement of Small particles without the use of ATP (ENERGY). High to low concentration. Passive Transport
- Osmosis – movement of Water only. Passive transport (no ATP used) high to low concentration.
- Permeable; semi permeable - Permeable, allows all materials to flow or pass through it. Semi-permeable only allows certain materials to pass  
The cell membrane is semi-permeable it only allows certain materials to pass.



# Discuss: Energy Transfers

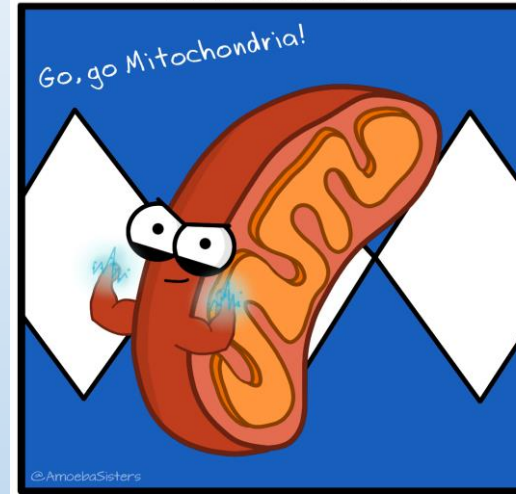
Cellular Respiration Formula



Photosynthesis Formula

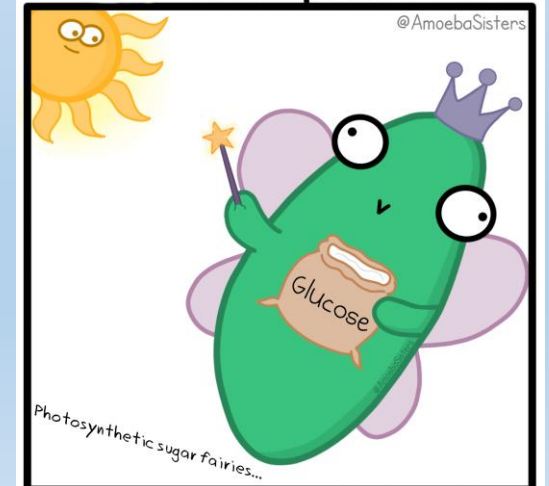
@AmoebaSisters

Mitochondrion



Mighty energy producer of the cell

Chloroplast



Glucose synthesizers of the cell

# Review Sheet

- Photosynthesis -

Opposite of cellular respiration. Performed by plants. Location: chloroplast. Glucose is produced.

Formula:  $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

- Cellular Respiration -

Opposite of photosynthesis. Location: mitochondria. ATP produced by breaking down glucose.

Formula:  $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 6\text{CO}_2 + \text{ATP}$

- ATP - Produced by the mitochondria during cellular respiration by breaking down glucose. ATP=ENERGY

# Discuss: Genetics

SOLVING PUNNETT SQUARES  
with Hairy (H) and Hairless (h) Guinea Pigs


©AmoebaSisters

**Codominance**  
We shall rule this chicken together!  
Huzzah!  
**BW**

It's just really hard for me to fully commit to this flower...  
**R r**  
**Incomplete Dominance**

©AmoebaSisters

Foil Method for Dihybrid Crosses

©AmoebaSisters

F  
O  
I  
L

**HhSs x hhss**

©AmoebaSisters

# Review Sheet

What is the difference between Dominant and Recessive?

Dominant represented by a capital letter recessive a lowercase letter. Dominant traits are expressed (seen).

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What is the difference between Genotype and Phenotype?

Geno= genes ( Aa, BB, CC) pheno=physical what you see.

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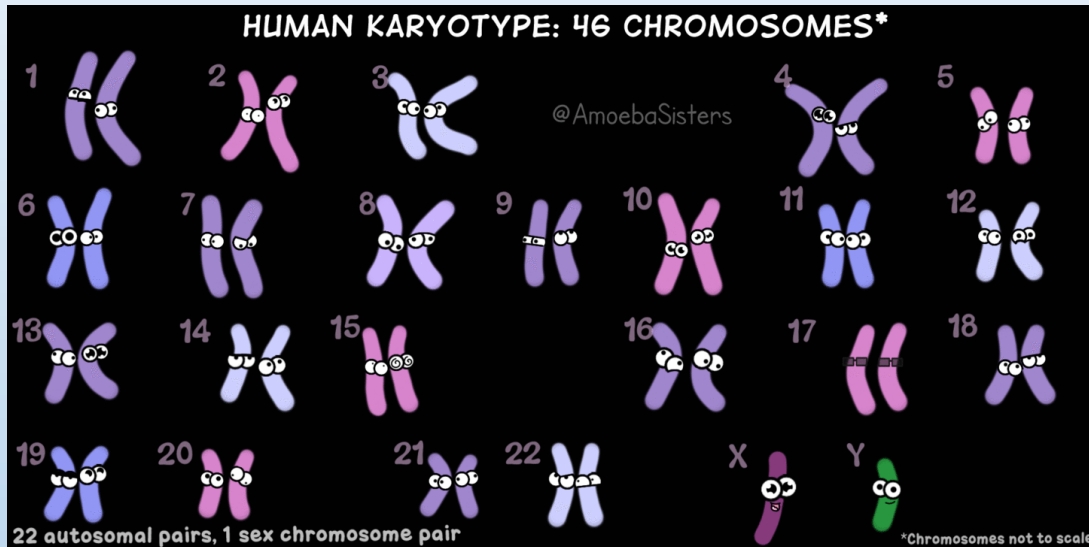
What is the difference between Homozygous and Heterozygous?

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Homozygous means the same (AA, aa)

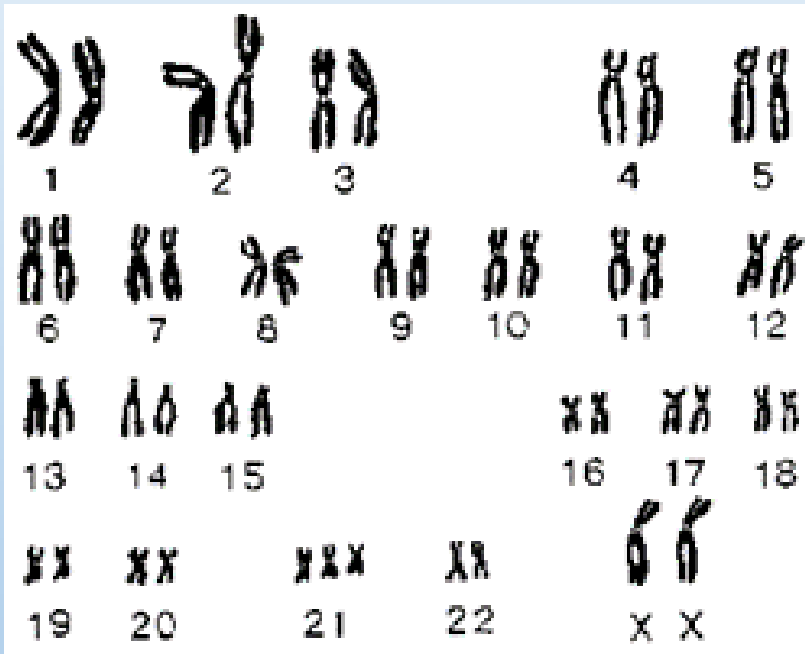
Heterozygous means different (Aa, Bb, Cc, Tt)

# Discuss: Karyotype



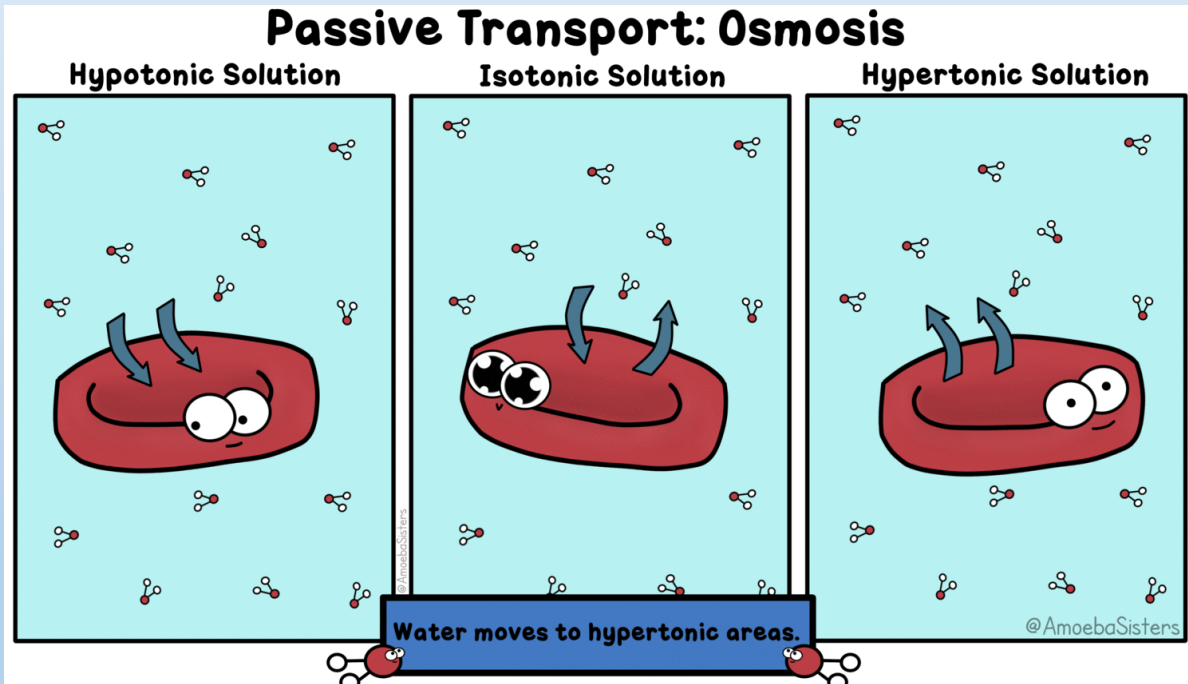
- 46 chromosomes in a normal human
- Any extra or missing chromosomes can cause genetic illnesses.
- XX= females
- XY=males
- Males more susceptible to genetic illnesses (sex-linked)

# Review Sheet



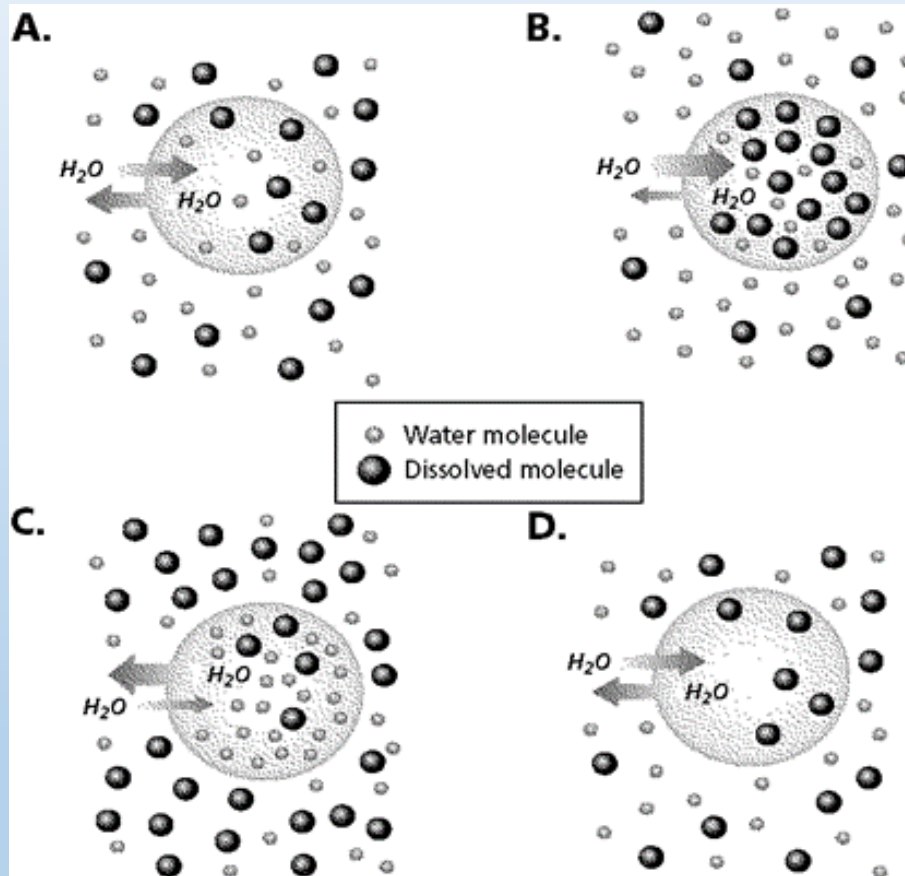
- Male or female?
- Normal amount of chromosomes?

# Discuss: Types of Solutions



- Follow arrows
- Think of a water balloon.
- Hypo= hippo

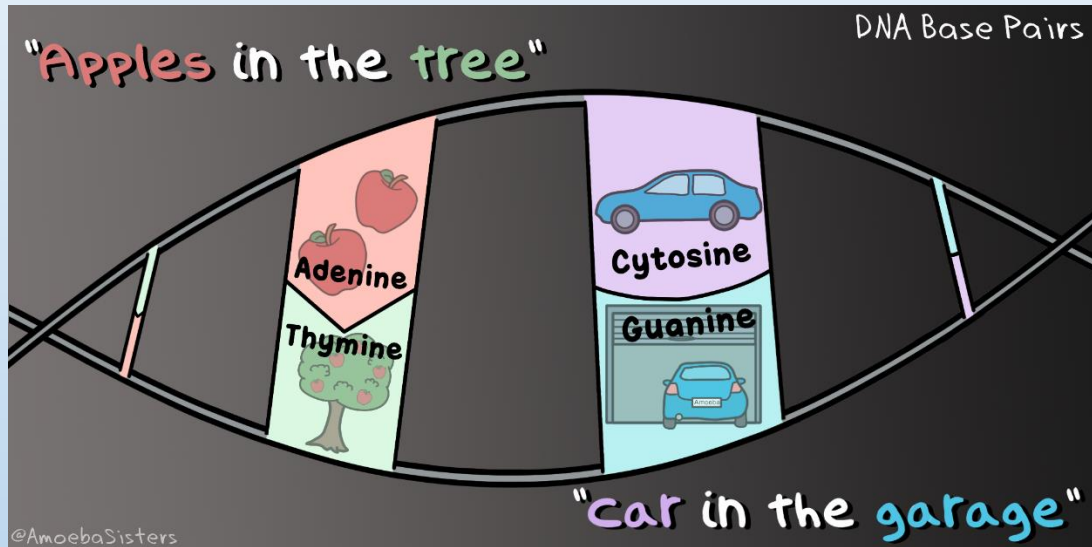
# Review Sheet



- A: stay the same isotonic
- B: swell hypotonic
- C: Shrivel hypertonic
- D: Stay the same isotonic.



# Discuss: Base Pairing



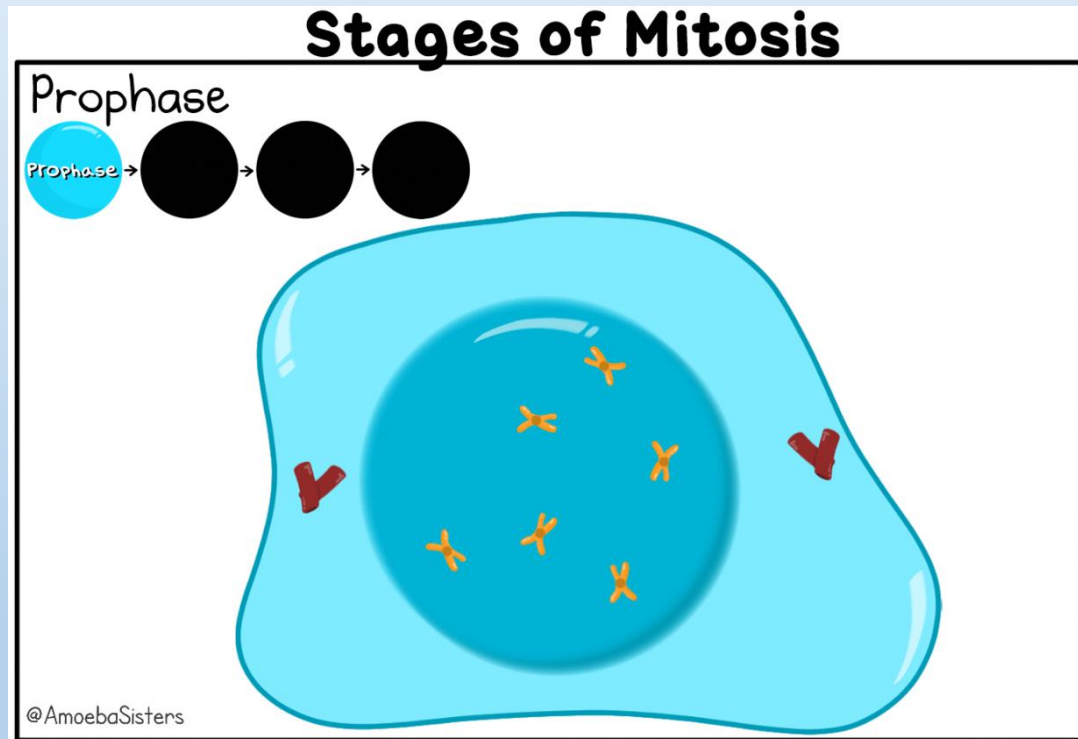
- DNA: A-T and C-G
- RNA: A-U and C-G

# Review Sheet



- GCAATCTA

# Discuss: Cell Cycle (Mitosis)



- IPMAT
- Interphase- DNA duplicating
- Prophase: chromosomes appear
- Metaphase (middle)
- Anaphase: apart
- Telephase: start seeing two cells
- Cytokinesis: cytoplasm divides two cells (daughter/ identical cells)

# Review Sheet



Interphase



Prophase



Metaphase



Anaphase



Telophase



Cytokinesis