

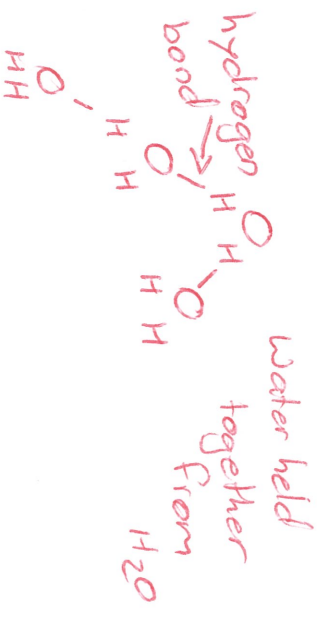
# Types of bonds (define and diagram)

**Ionic bond** - Occurs between ions + and -  
 electrical charge  
 $Na^+ Cl^-$   
 attract to make salt  
 $NaCl$

**Covalent bond** - atoms share electrons  
 Most biological molecules are held together this way  
 Sharing is equal - non-polar  
 or  
 not equal share - Partially - lesser negative charge + change - polar  
 $H_2O$  - polar  
 $O$  - partially negative  
 $H$  - partially positive  
 $CH_4$  - non-polar

## Hydrogen bond -

Formed by attraction of Polar molecules  
 not very strong  
 Partially +  $\rightarrow$  Partially - attract



# Hydrophilic

(Polar)

- Likes water - will dissolve in



Form hydrogen bonds  
with  $H_2O$  - so they  
dissolve

Cell  
membranes

hydrophobic

# Hydrophobic

Non-polar

- Doesn't like  $H_2O$  - clumps together to get away  
from  $H_2O$

No hydrogen bonds

- Don't dissolve in

$H_2O$

will dissolve  
in another

hydrophobic  
substance

# Synthesising biomacromolecules

- Autotroph –
- Chemotroph –
- Heterotroph –

Match the definition

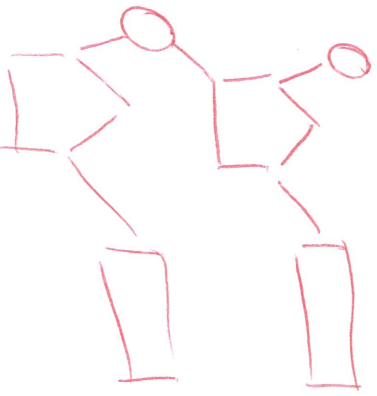
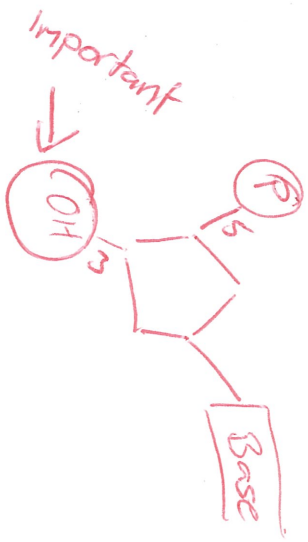
- *Chemo* an organism that synthesis food through chemical processes other than photosynthesis.
- *Hetero* organisms that consume other organisms as food. They are not able to make organic molecules from simple inorganic compounds.
- *Auto* an organism that makes its own food from light energy or chemical energy without eating.

# Polymerisations - joining of monomers - form long chain

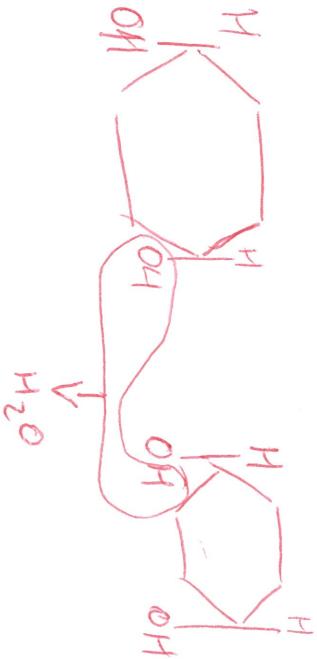
link small repeating molecules

Example

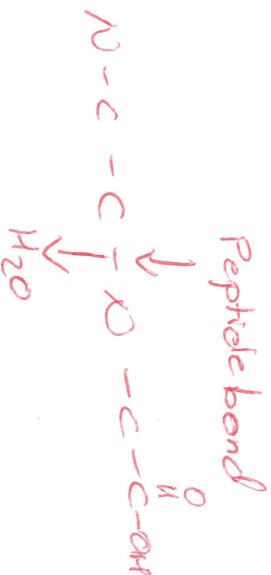
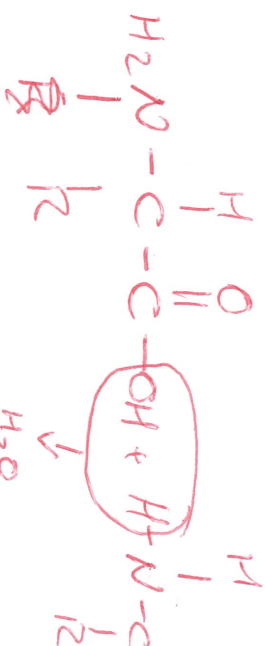
## Nucleic acid



## Carbohydrates



## Proteins



# Nucleic acids

Sugar  
phosphate  
nitrogenous base

~~Phosphate~~

C ≡ G  
A = U  
RNA - Uracil  
no thymine

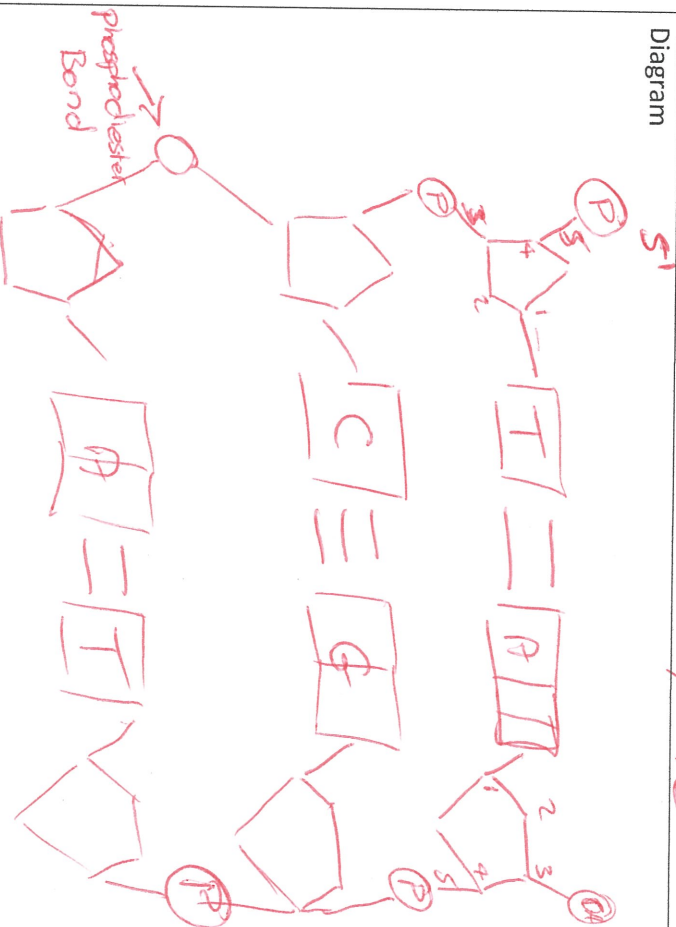
## Facts

- \* Found nucleus + Mitochondria
- \* DNA code
  - what to do
  - what proteins to make
- \* Double Helix
- \* RNA single strand
- \* Link together 5' to 3'
  - used in DNA replication
  - translation for RNA
- \* 3' hydroxyl group - important for
  - put into codons for protein synthesis
  - code for amino acids

## Summary sentence

- genes code for proteins - only
- RNA actually codes for proteins
- \* codon table - amino acid code
- \* RNA take DNA code to mRNA (translation)
- Ribosome - Ribosomes read mRNA
- tRNA bring codon to make protein (transcription)

## Diagram



# Carbohydrates

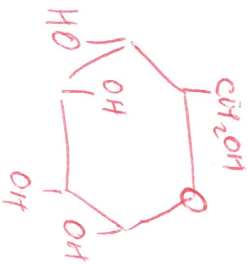


## Facts

- \* Source energy and for structural component
- \* - makes glycoproteins glycolipids
- \* cellulose - structural support to plants
  - no nutrient value to humans
  - bacteria helps animals break it down

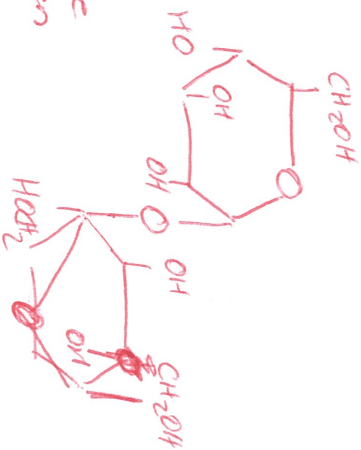
## Diagram

Monosaccharide (glucose)



Triose  
Pentose  
Hexose

Disaccharide (sucrose)



Lactose  
Maltose

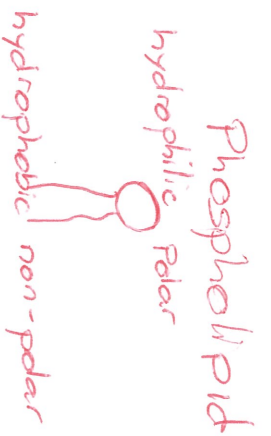
Polysaccharide (starch)  
~~sacrose~~  
amylose starch  
cellulose  
glycogen  
chitin



Summary sentence

# Lipids

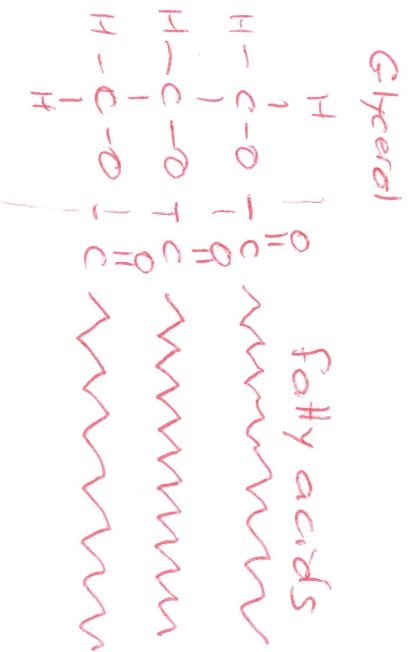
H, C, O, P, N



## Facts

- \* Fats, oils + waxes
- \* hydrophobic, some hydrophilic, some both (enzymes)
- \* E function
  - energy storage
  - structural component membrane
  - specific biological function

## Diagram



Saturated  
 Found in animals  
 solid  
 C-C  
 Max number H bonded to each carbon

Unsaturated  
 Found in plants  
 Liquid  
 C=C  
 Double bonds between

## Summary sentence

Some C not max number H

# Protein



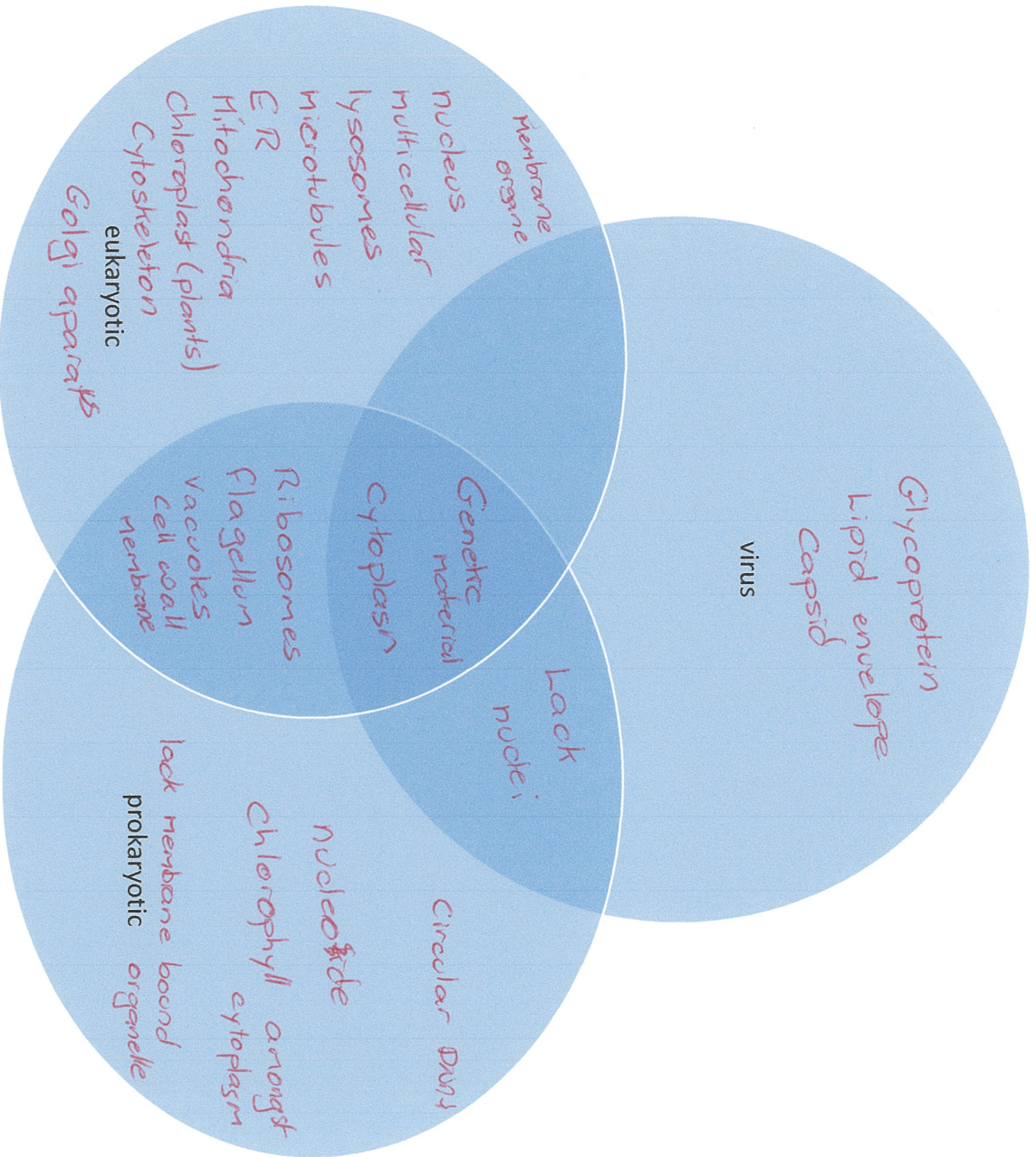
| Facts   | Diagram   |
|---|---|
| <ul style="list-style-type: none"> <li>- Proteome - whole set of proteins produced by a cell</li> <li>- Involved in structure of cells + many chemical reactions - using enzymes</li> <li>- Made 20 amino acids</li> <li>- Amino acids bond to form linear polymers               <ul style="list-style-type: none"> <li>- Fold, twist + coil</li> <li>- Arrangement of folds give proteins different characteristics.</li> </ul> </li> <li>* Can denature               <ul style="list-style-type: none"> <li>- small can return to normal</li> </ul> </li> </ul> | <p>Primary structure DNA determines sequence</p> <p>Secondary <math>\alpha</math> helix - hydrogen bonds between amino acids at different locations</p> <p>peptide bonds<br/>peptide strands</p> <p><math>\beta</math> pleated sheet</p> <p>Tertiary many loops + folds gives them shape</p> <p>Quaternary more than 1 polypeptide eg Haemoglobin</p> |
| <p>Summary sentence</p> <p>Types -</p> <ul style="list-style-type: none"> <li>- Motility</li> <li>- Structural</li> <li>- Enzymes</li> <li>- transport</li> <li>- Hormones</li> <li>- Cell - surface receptors</li> <li>- Neurotransmitters</li> <li>- Immunoglobulins</li> <li>- Poison + toxins</li> </ul>  |   |

Carboxyl end



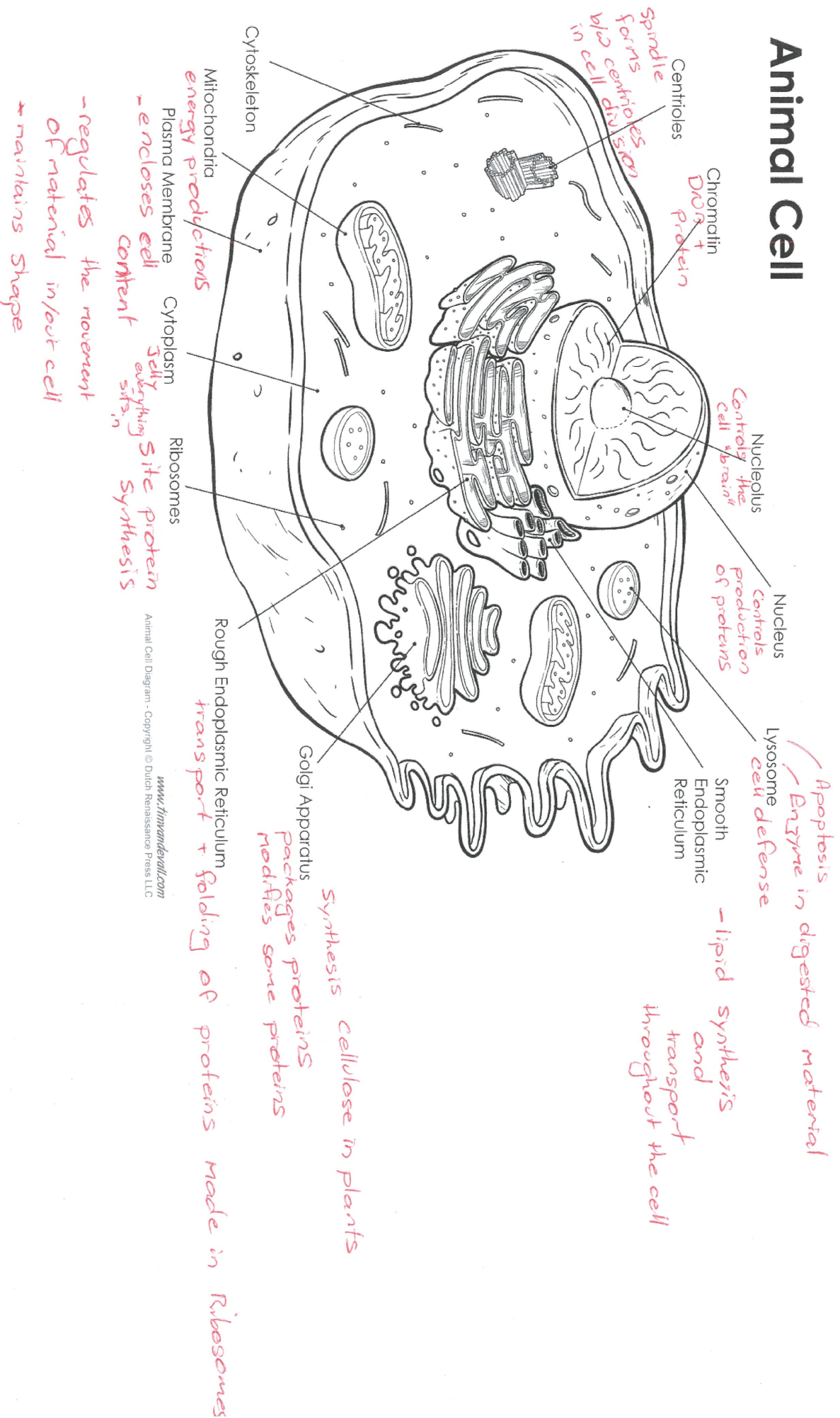


Types cells



What's my job in the cell? (tell me what each organelle in the cell's job is)

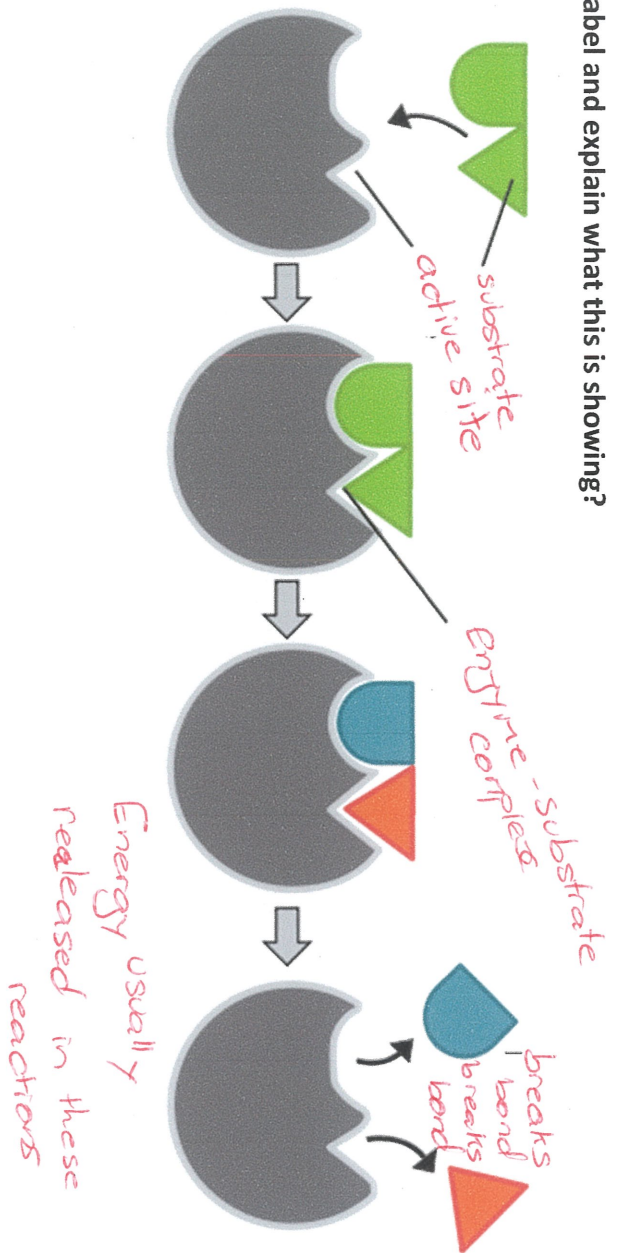
# Animal Cell



## What type of cell am I found in?

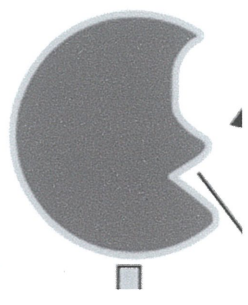
| Organelle                    | Prokaryotic | Animal cell | Plant cell |
|------------------------------|-------------|-------------|------------|
| Cell membrane                | ✓           | ✓           | ✓          |
| Nucleus                      |             | ✓           | ✓          |
| Nuclear membrane             |             | ✓           | ✓          |
| Mitochondria                 |             | ✓           | ✓          |
| Ribosomes                    | ✓           | ✓           | ✓          |
| Smooth endoplasmic reticulum |             | ✓           | ✓          |
| Rough endoplasmic reticulum  |             | ✓           | ✓          |
| Golgi complex                |             | ✓           | ✓          |
| Lysosome                     |             | ✓           | ✓          |
| Vacuole                      |             | ✓           | ✓          |
| Chloroplast                  |             |             | ✓ some     |
| Centriole                    |             | ✓           |            |
| Flagella                     | ✓ some      | ✓ some      | ✓ some     |
| Cell wall                    | ✓           |             | ✓          |

Label and explain what this is showing?



Energy usually released in these reactions

What would denaturing do to this?  
changes shape of active site  
no longer binding site



What causes denaturing to occur?

Heat  
PH

Lock + key method  
- highly specific active site

Induced-fit model  
- enzyme + substrate can modify the shape of the enzyme to accommodate

What are the 2 ways inhibitors work?

competitive

- binds active site
- temporary
- prevents binding of enzyme + substrate

non-competitive

- binds with enzyme at another part of molecule
- alters shape of enzyme
- can't bind to active site

How to we develop drugs that effect the function of an enzyme?

each enzyme unique fit for a function

- Develop drugs that inhibit the activity of enzymes - competitive inhibitor

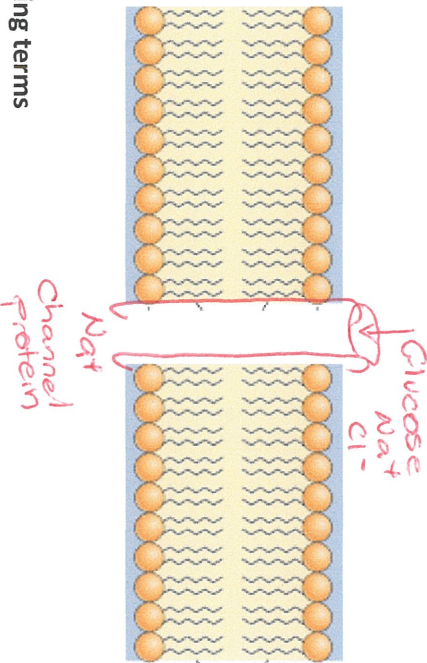
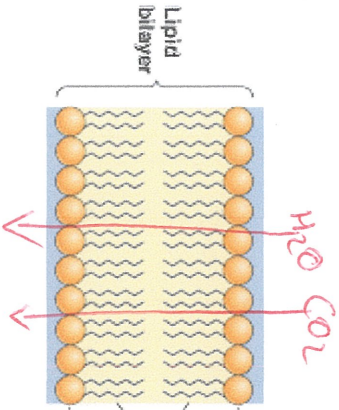
Binding Poisons - stop function of enzyme

CO-enzymes

- chemical component - add to enzyme to be active

For the substances listed below draw in the cell membrane what they require in order to cross the membrane and show how they cross the membrane. Water, carbon dioxide, glucose, chloride, large food particle, polar molecule, amino acids.

This cell has a high concentration of sodium inside the cell but still requires more in order to function well, how will it get into the cell?



active transport  
against  
conc gradient

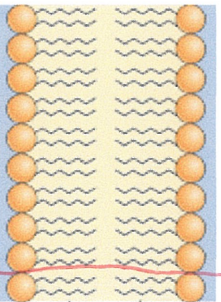
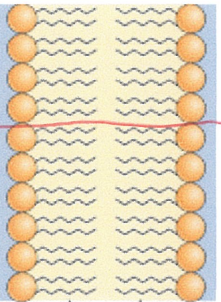
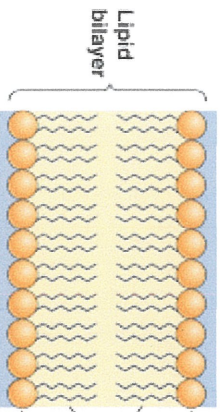


Use the diagram above to show the following terms

Diffusion Through phospholipids

Facilitated diffusion Protein channel

Active transport - against conc gradient

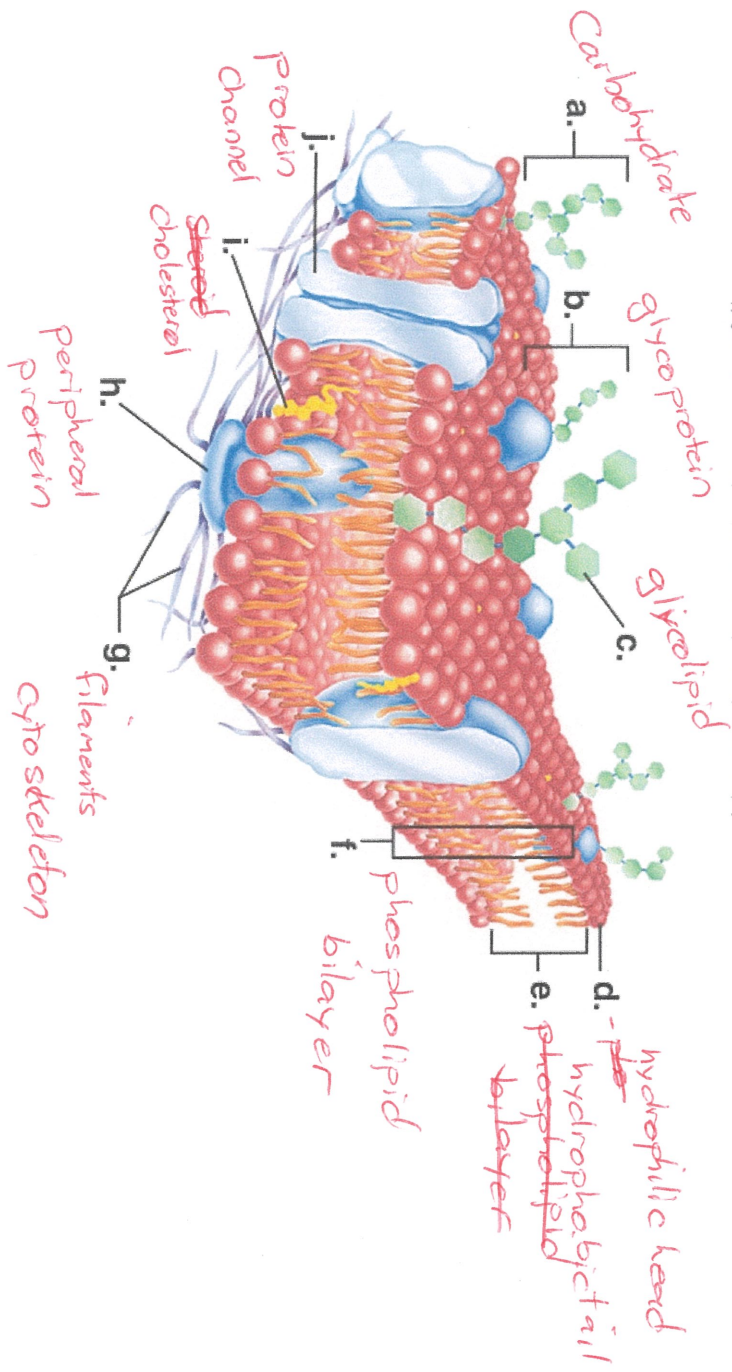


Explain the difference between endocytosis and exocytosis. Use a diagram to help with this explanation.

Handwritten notes:  $CO_2$ ,  $H_2O$ ,  $Na^+$ ,  $H_2O$ ,  $H_2O$

**Label**

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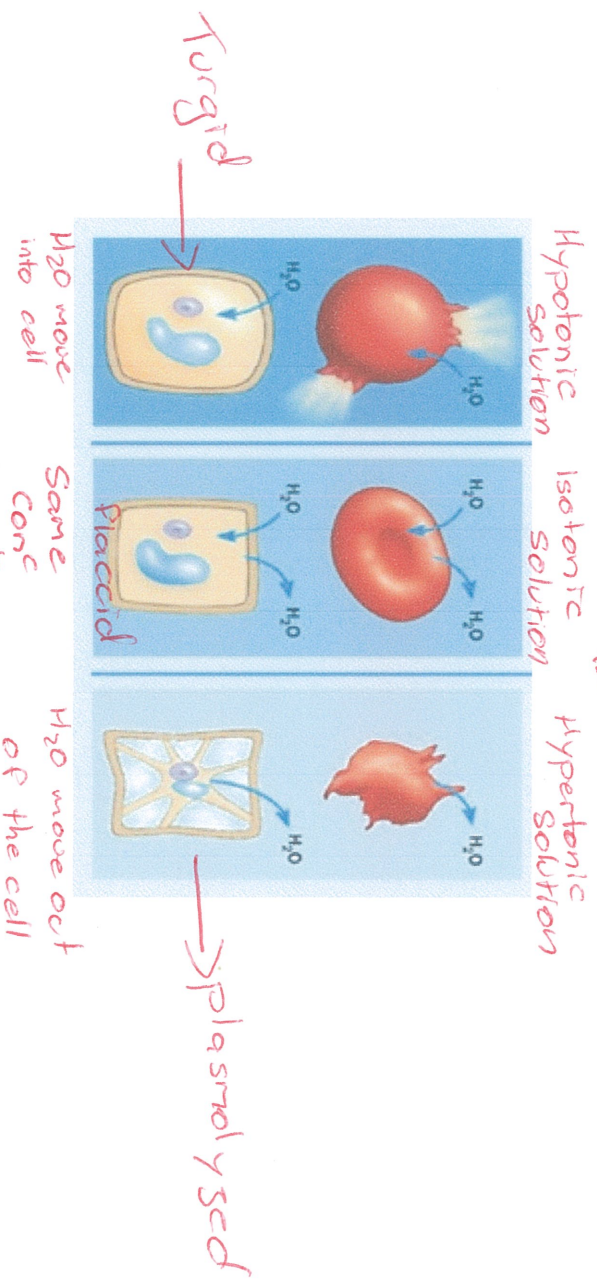




What is the difference between osmosis and diffusion?

1  
 H<sub>2</sub>O + movement across membrane  
 high to low conc  
 100% conc  
 solid, liquid, gas  
 disperse randomly  
 and fill available space

Name and explain the following diagrams



**Reactions for cells**

Why do cells need energy?

plasmolysis

What is another name for an anabolic reaction?

**What is an anabolic reaction?**

**What is another name for a catabolic reaction?**

**What is a catabolic reaction?**

**What is ATP?**

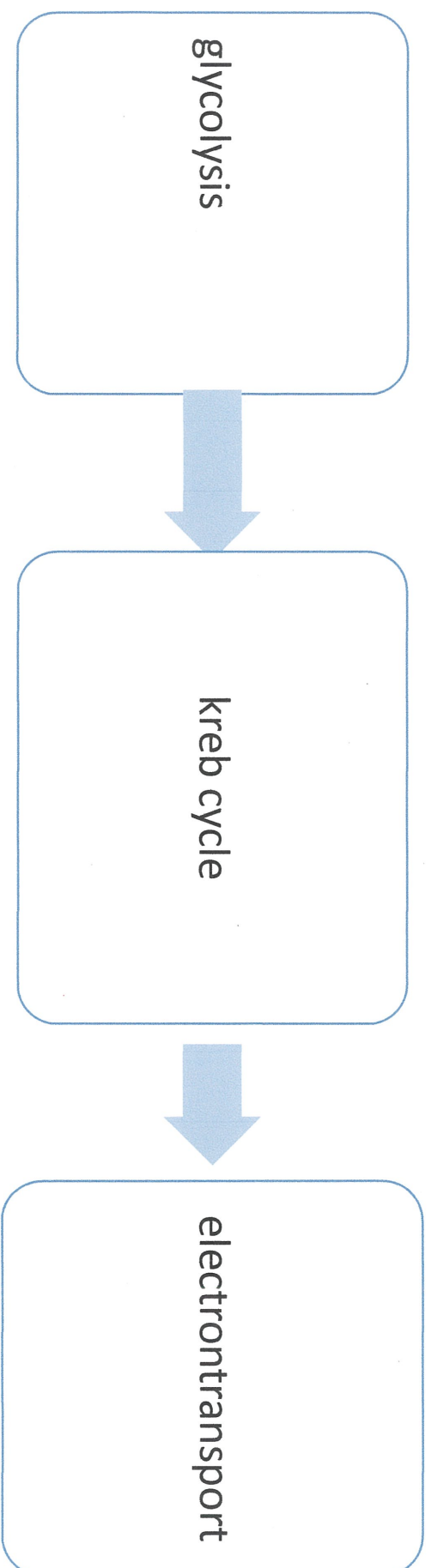
**What is the chemical equation for ATP?**

**ATP →**

**What is the equation of respiration?**

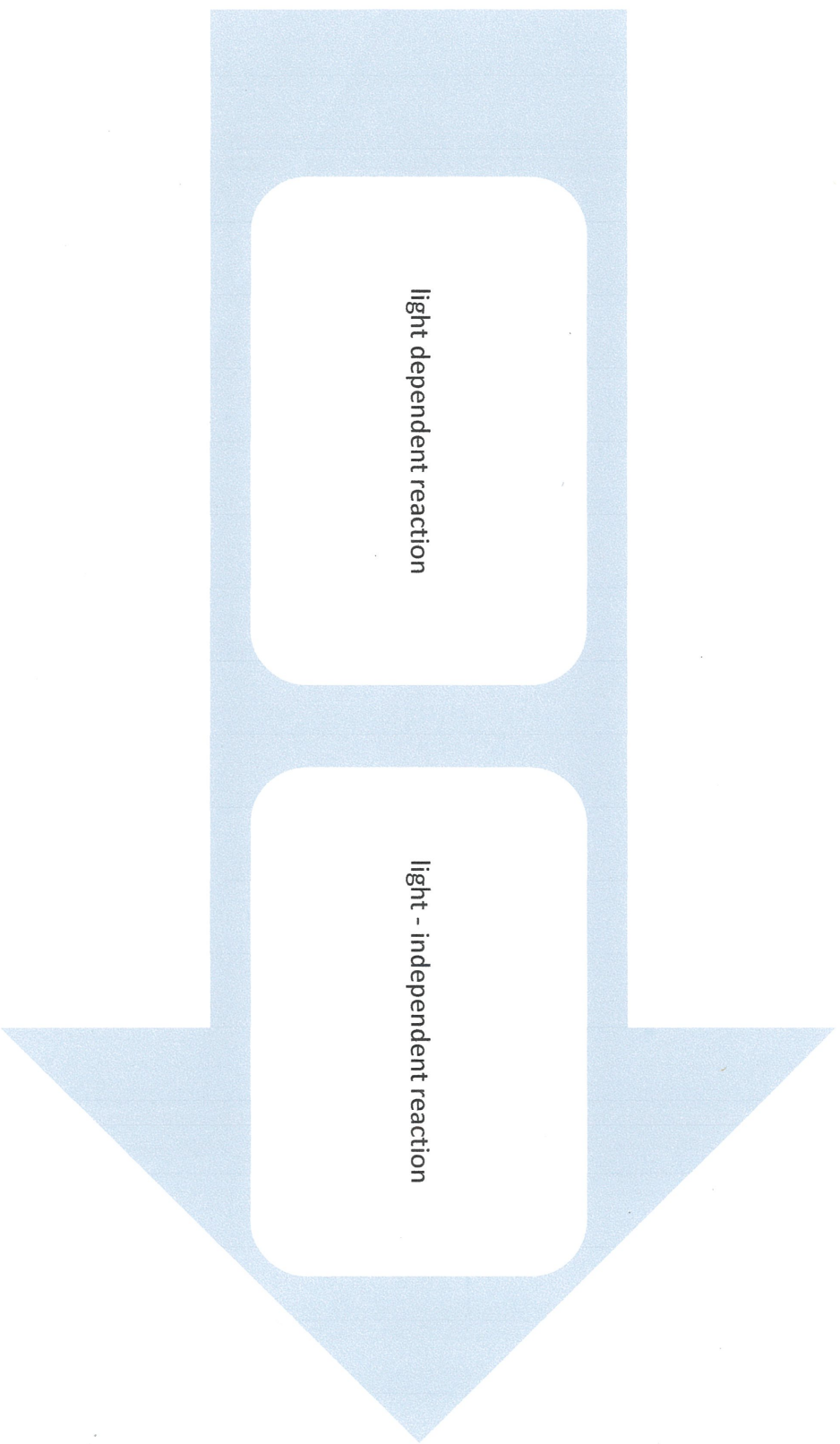
**What is the equation for photosynthesis?**

Explain the process of respiration

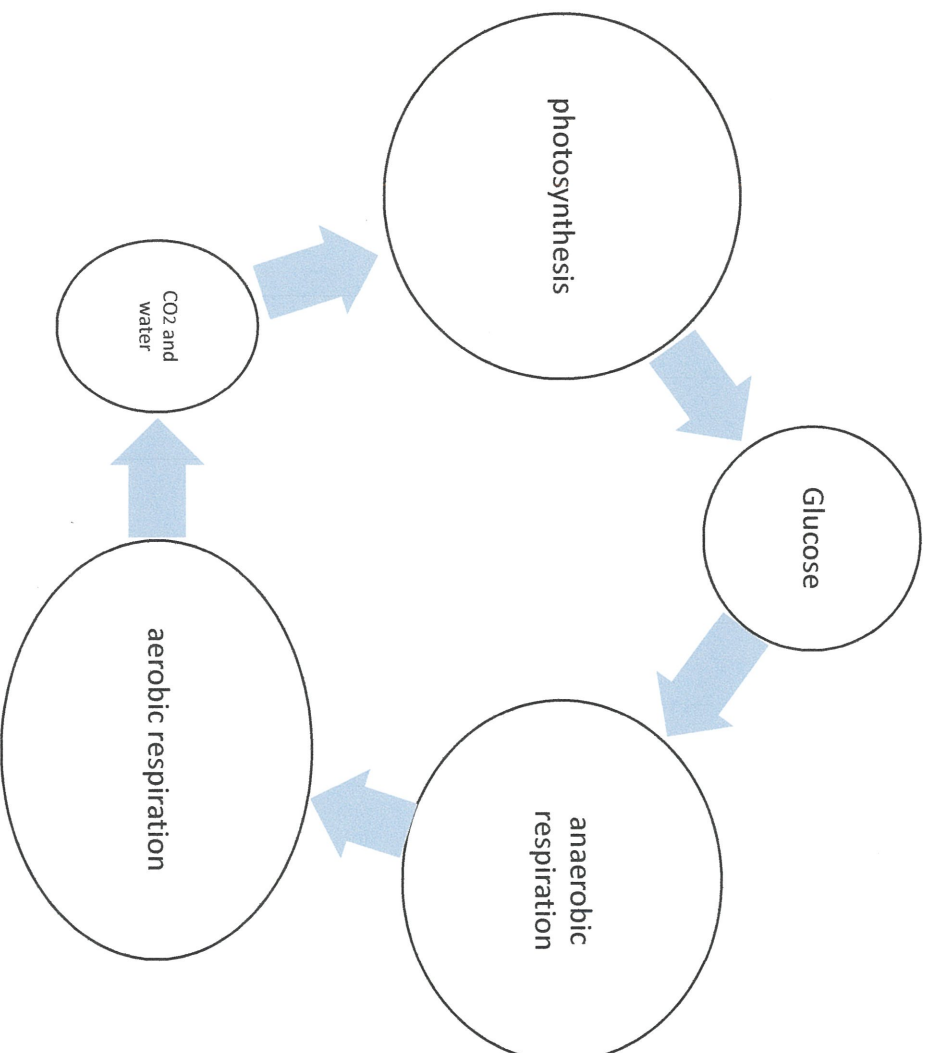


How does aerobic respiration, differ to anaerobic respiration?

## Explain the photosynthetic process



Add detail to the cycle below to explain what is happening



To the cycle above add in the ATP – ADP cycle