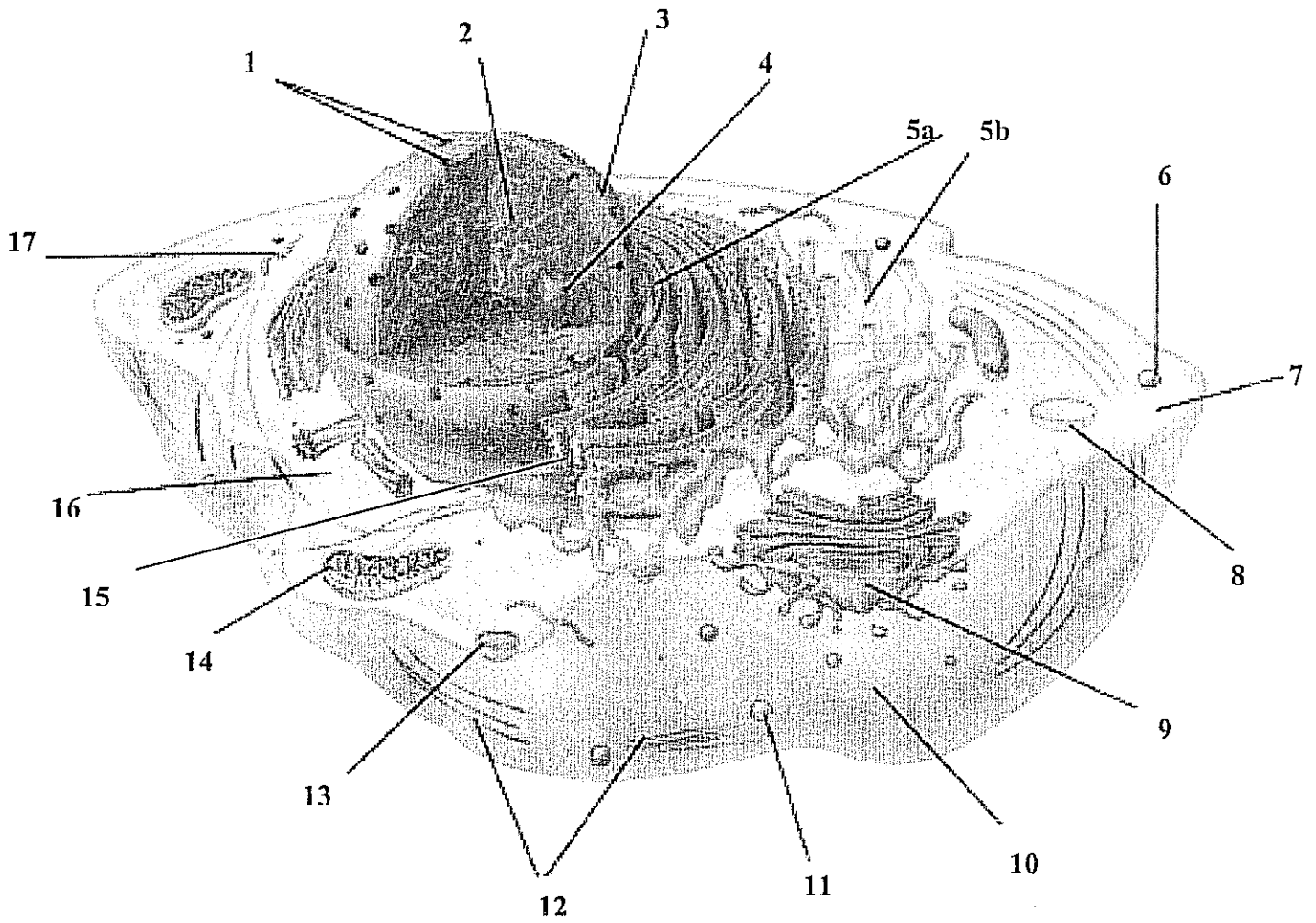
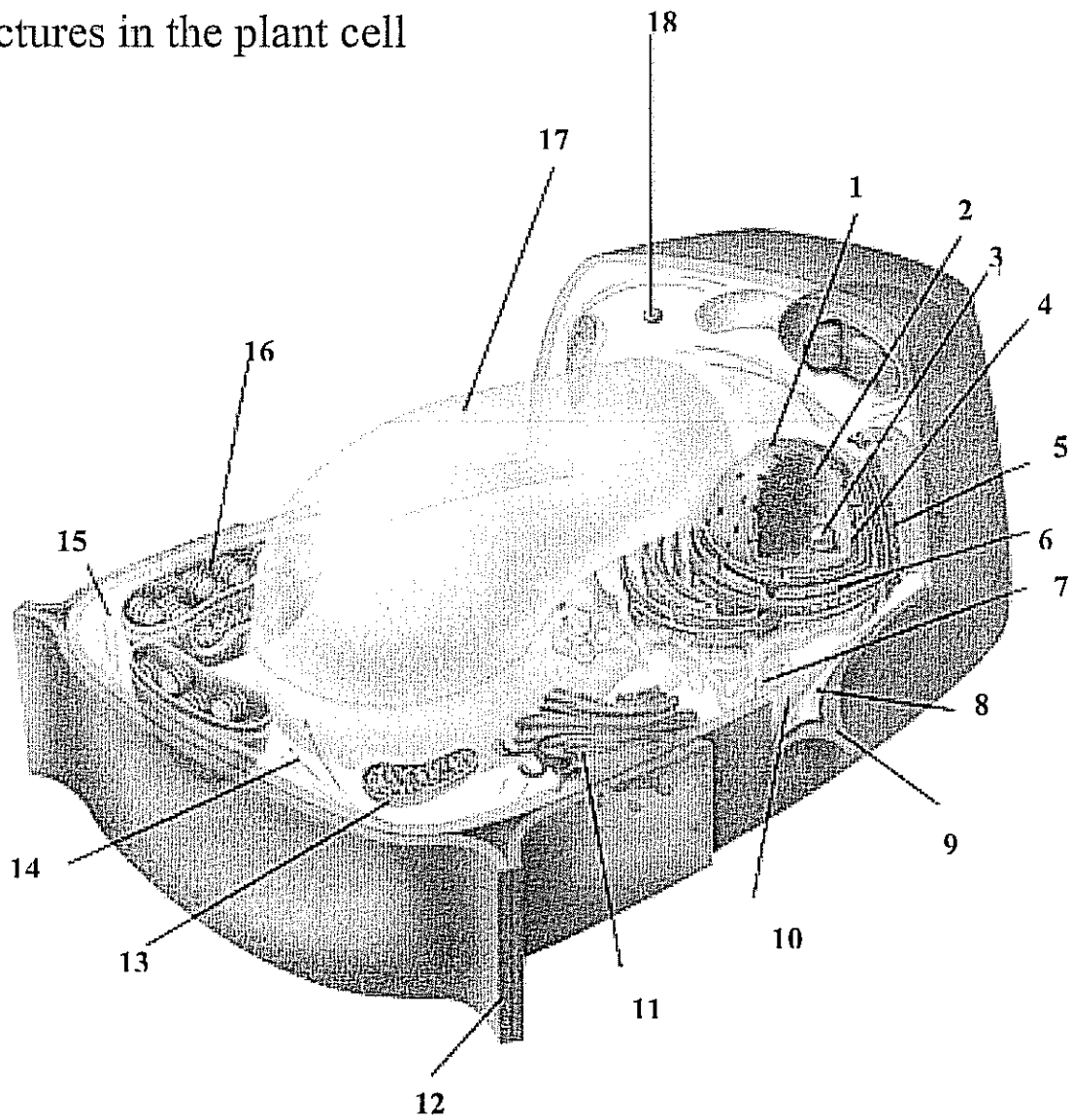


# Structures in the animal



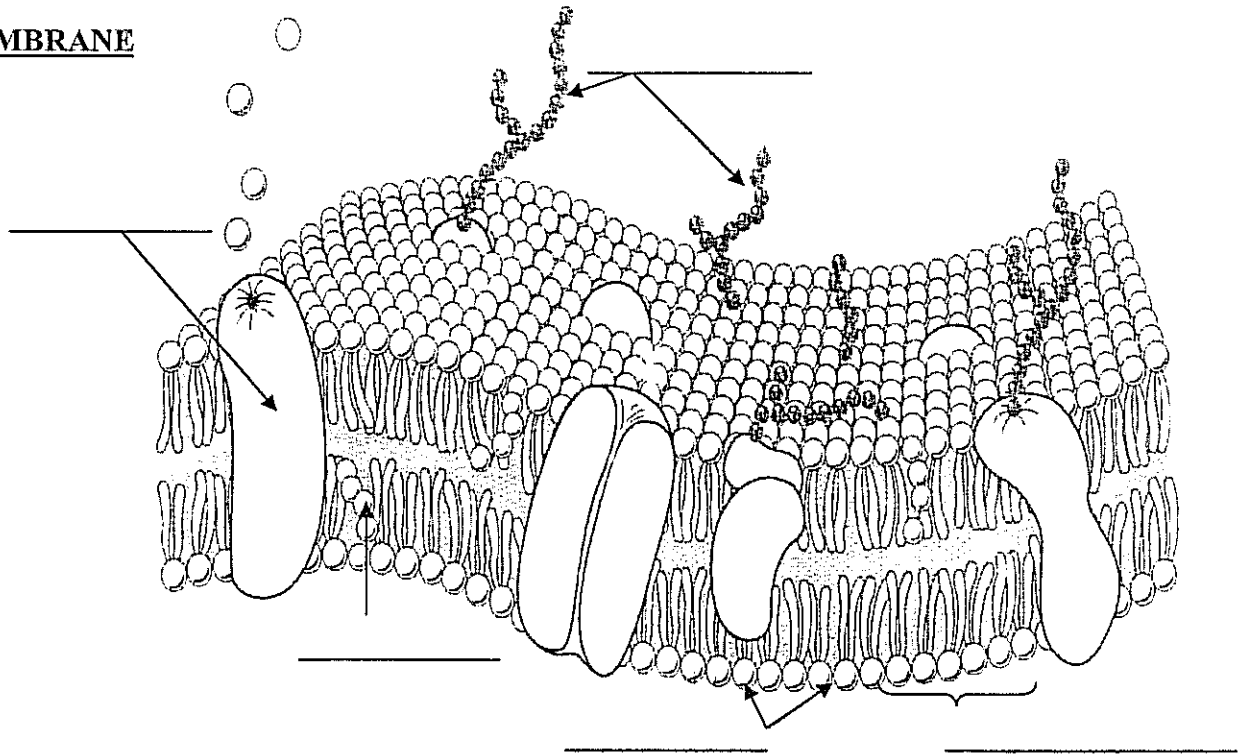
#	Name of structure	#	Name of structure
1		9	
2		10	
3		11	
4		12	
5a		13	
5b		14	
6		15	
7		16	
8		17	

# Structures in the plant cell



#	Structure	#	Structure
1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9		18	

PLASMA MEMBRANE



Phospholipid: composed of a \_\_\_\_\_ "head" and \_\_\_\_\_ "tails."



Hydrophilic Head is "water \_\_\_\_\_" or soluble in water.

Hydrophobic Tails are "water \_\_\_\_\_" or insoluble in water.

Proteins: "float" around within the \_\_\_\_\_ or on its surface;

functions include: \_\_\_\_\_ | support

surface \_\_\_\_\_ sites for molecules like hormones

\_\_\_\_\_ sites for cell to cell communication & interaction

transport molecules \_\_\_\_\_ the membrane

transport electrons & protons \_\_\_\_\_ the membrane

Glycocalyx: \_\_\_\_\_ chains attached to proteins (glycoproteins),

involved in \_\_\_\_\_ & communication proteins, points for cell to cell attachment

Cholesterol: keeps the phospholipids \_\_\_\_\_ and helps retain the membrane's shape

**Mitochondria**

Mitochondria are the site of aerobic cellular \_\_\_\_\_

Cellular respiration is the process that converts sugar energy into \_\_\_\_\_ (ATP) for storage

(overall reaction: glucose + \_\_\_\_\_ → \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_)

ATP is used by other organelles & cell processes for \_\_\_\_\_

outer membrane – \_\_\_\_\_ and controls entry of materials

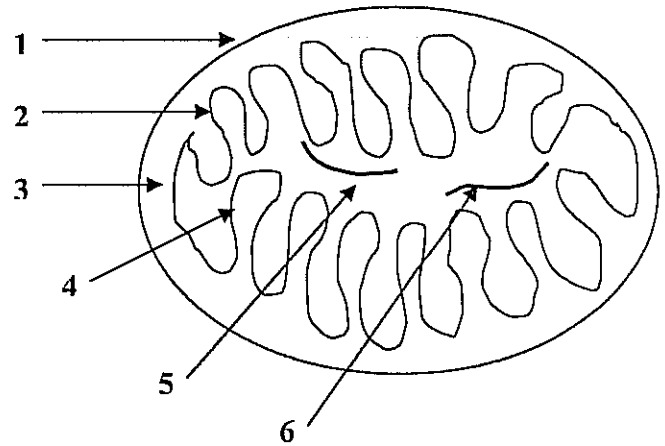
inner membrane – \_\_\_\_\_ into cristae

intermembrane space cytosol containing \_\_\_\_\_

Cristae: site of chemical \_\_\_\_\_ using embedded proteins

Matrix: mitochondrion \_\_\_\_\_

Mitochondrial DNA: \_\_\_\_\_ organelle, produces its own unique proteins

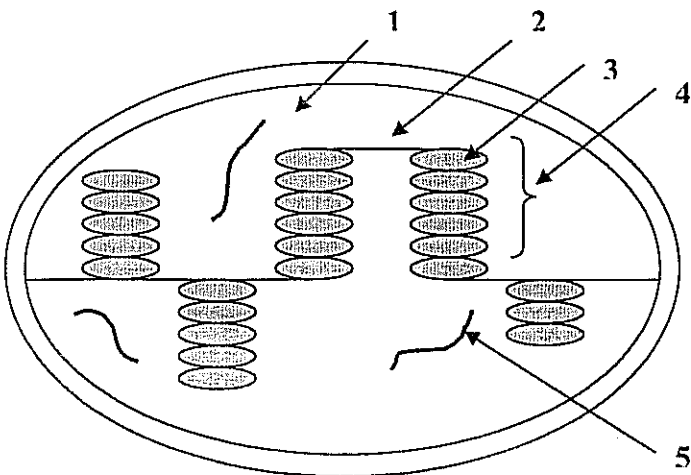


**Chloroplast:**

Chloroplasts are found only in \_\_\_\_\_ plants

They convert sunlight to \_\_\_\_\_ via photo-synthesis

(sunlight + \_\_\_\_\_ + \_\_\_\_\_ → \_\_\_\_\_ + \_\_\_\_\_)



Stroma: chloroplast \_\_\_\_\_

Lamella: membrane that \_\_\_\_\_ inner chloroplast structures

Thylakoid disk: have a specialized membrane for \_\_\_\_\_

Grana: \_\_\_\_\_ of thylakoid discs

Chloroplast DNA: \_\_\_\_\_ organelle

## Nucleus:

**Nucleolus:** a \_\_\_\_\_ area within the nucleus;

the location for production of \_\_\_\_\_

**Chromatin:** stringy material made of \_\_\_\_\_ and \_\_\_\_\_, the majority of the nucleus

**Chromosomes:** just before the cell divides the chromatin \_\_\_\_\_ into chromosomes

**Ribosomes:** are microscopic \_\_\_\_\_ attached to the ER or free-floating in the cytoplasm

these small organelles are \_\_\_\_\_ factories

## Endoplasmic Reticulum:

The ER is a twisting network of \_\_\_\_\_ and \_\_\_\_\_ extending through the cytoplasm and connecting the cell membrane to the nuclear membrane

The ER may have \_\_\_\_\_ attached to it (rough ER)

The ER serves to \_\_\_\_\_ products (e.g. proteins) within the cell

## Golgi Apparatus:

The Golgi bodies are sacs of membranous plate-like bags which produce \_\_\_\_\_ (sacs)

They function to produce and store cellular \_\_\_\_\_

Many proteins and lipids undergo final \_\_\_\_\_ in the Golgi complex

## Lysosomes:

Membrane bound sacs that are used for \_\_\_\_\_ of various structures within the cell

An acidic environment along with hydrolytic \_\_\_\_\_ within lysosomes help to digest particles

## Cilia and Flagella:

Both are made of fine \_\_\_\_\_ fibres

Both can be used for \_\_\_\_\_

**Cilia:** \_\_\_\_\_, may be numerous on cell surface

**Flagella:** \_\_\_\_\_, usually few in number on cell surface

## Cell Reactions and Energy

- \_\_\_\_\_ energy molecule of the cell
- bond holding the 3<sup>rd</sup> phosphate is a \_\_\_\_\_ bond and can be easily broken
- $\text{H}_2\text{O} + \text{_____} \rightarrow \text{ADP} + \text{Pi} + \text{Energy}$
- Endergonic Reactions (energy \_\_\_\_\_), anabolic reaction (\_\_\_\_\_ molecules)
- Exergonic Reactions (energy \_\_\_\_\_), catabolic reactions (\_\_\_\_\_ molecules apart)

## Photosynthesis

- An \_\_\_\_\_ process
- \_\_\_\_\_ produce their own food by photosynthesis;
- the process occurs in the \_\_\_\_\_
- overall reaction: carbon dioxide + \_\_\_\_\_  $\longrightarrow$  \_\_\_\_\_ + oxygen

Photosynthesis occurs in two steps:

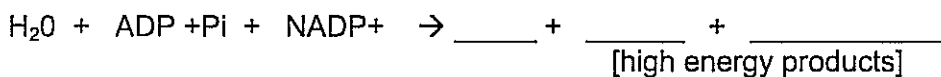
Light Dependent Reactions: Making high \_\_\_\_\_ products

Light Independent Reactions: Using the high energy products to capture \_\_\_\_\_

### 1. Light dependent reaction

- only take place in the presence of \_\_\_\_\_
- solar energy is absorbed by \_\_\_\_\_ in chloroplasts
- \_\_\_\_\_ molecules are split  
(\_\_\_\_\_ is released into atmosphere,  
\_\_\_\_\_ takes part in light independent reactions)
- occurs in the \_\_\_\_\_ disk membrane

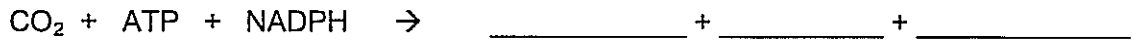
FORMULA:



## 2. Light independent reaction

- hydrogen and carbon dioxide combine to form \_\_\_\_\_ molecules
- occurs in the \_\_\_\_\_
- plants use some glucose for life processes (e.g. \_\_\_\_\_, \_\_\_\_\_)
- most plants convert glucose to \_\_\_\_\_ (for storage)

FORMULA:



overall reaction of photosynthesis:



## **Cell Respiration**

- cell respiration is the release of energy from food (\_\_\_\_\_)
- all cells perform this \_\_\_\_\_ process
- cell respiration occurs in two steps:

Step 1: \_\_\_\_\_

Step 2: Aerobic or Anaerobic \_\_\_\_\_

### **1. Glycolysis**

- occurs in the \_\_\_\_\_

FORMULA:



- this process does \_\_\_\_\_ produce very much energy
- most of the energy is still contained in the bonds of the 2 \_\_\_\_\_
- there are three possible reactions that \_\_\_\_\_ pyruvate (step 2)

### **2. getting rid of pyruvate**

- cells must replace \_\_\_\_\_ as it is needed in glycolysis
- and if the cell runs out, glycolysis \_\_\_\_\_

There are two options:

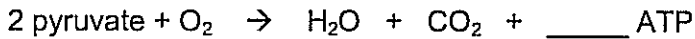
\_\_\_\_\_ CELLULAR RESPIRATION

\_\_\_\_\_ CELLULAR RESPIRATION

## 2a. Aerobic Cellular Respiration

occurs in the \_\_\_\_\_

the process is aerobic (\_\_\_\_\_ dependent)



## 2b. Anaerobic cellular respiration

### Lactic Acid Fermentation:

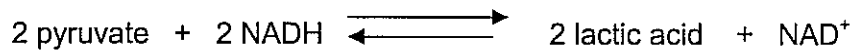
occurs only in animal \_\_\_\_\_ cells that are deprived of oxygen

if oxygen is unavailable for aerobic respiration, the cell converts the pyruvate into

\_\_\_\_\_ which causes muscle cramps

when oxygen is available, the lactic acid is converted back into \_\_\_\_\_

Formula:



### Alcohol Fermentation:

-occurs in anaerobic \_\_\_\_\_ and \_\_\_\_\_, [as bacteria do not have \_\_\_\_\_]

Formula:



-process is used to make \_\_\_\_\_ beverages

LACTIC ACID FERMENTATION	ALCOHOL FERMENTATION
Glycolysis _____ ATP	Glycolysis _____ ATP
Product: _____	Product: _____ + _____
Potential: _____ more ATP	Potential: _____ more ATP
total: _____ ATP	total: _____ ATP



# Transport through the Cell Membrane

## A. Passive Transport:

is the movement of molecules through the cell membrane without cellular \_\_\_\_\_

there are 3 types: \_\_\_\_\_; \_\_\_\_\_; and \_\_\_\_\_ diffusion

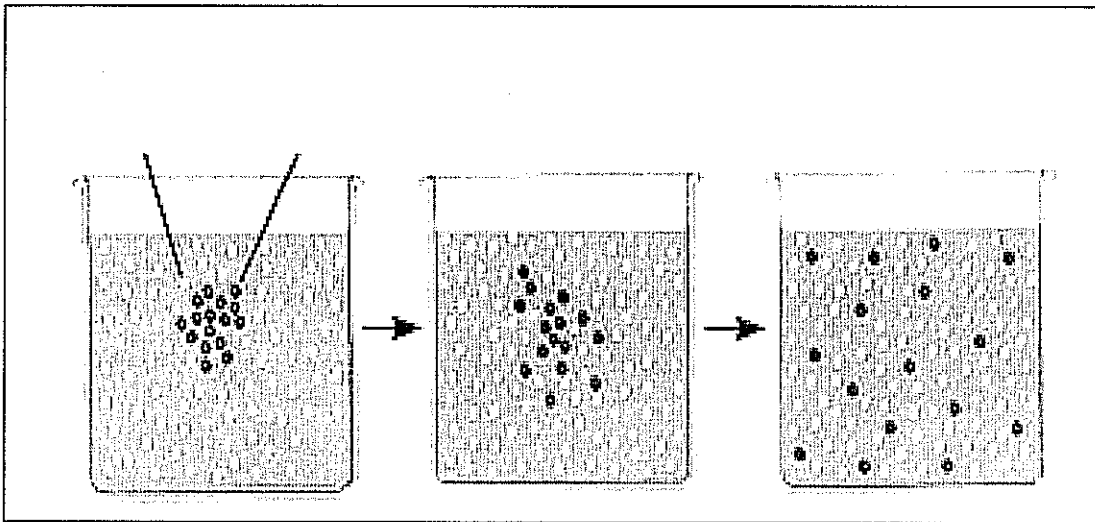
### 1. Diffusion

- molecules are in constant \_\_\_\_\_
- diffusion is the process by which particles move naturally from an area of \_\_\_\_\_ concentration to an area of \_\_\_\_\_ concentration until a dynamic equilibrium is reached (no \_\_\_\_\_ movement)

[ ] → [ ]

- this is called moving "with the concentration \_\_\_\_\_"
- small molecules diffuse through the phospholipids of the cell membrane

(e.g. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_)



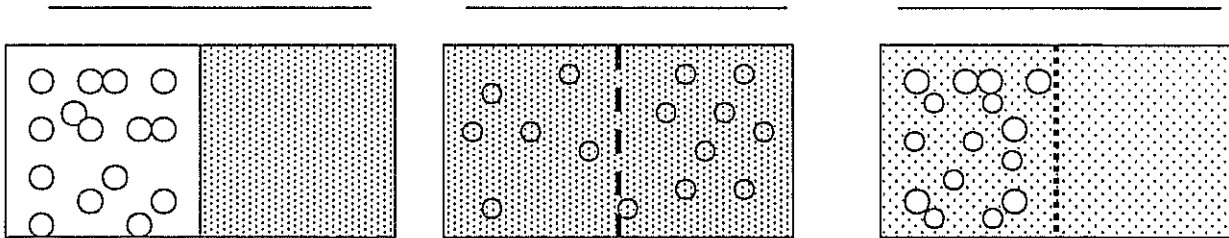
### Factors that affect diffusion

- \_\_\_\_\_ (increasing it, ↑ rate of diffusion)
- \_\_\_\_\_ (increasing it, ↑ rate of diffusion)
- \_\_\_\_\_ (increasing it, ↑ rate of diffusion)
- \_\_\_\_\_ (increasing it, ↑ rate of diffusion)

## 2. Osmosis

- osmosis is the diffusion of \_\_\_\_\_ through a semi-permeable membrane

Three types of membranes:



Which membrane is most like a cell membrane? \_\_\_\_\_

**Three terms for solutions:**

- **Solute:** the \_\_\_\_\_ substance, e.g. salt
- **Solvent:** able to \_\_\_\_\_ things, e.g. water
- **Solution:** \_\_\_\_\_ of solvent and solute

**Three types of solutions:**

- **Hypertonic solution:** the solution surrounding the cell has a \_\_\_\_\_ [solute] than the cell's cytoplasm, water moves *out of* the cell
- **Hypotonic solution:** the solution surrounding the cell has a \_\_\_\_\_ [solute] than the cell's cytoplasm, water moves *into* the cell
- **Isotonic solution:** the [solute] is the \_\_\_\_\_ in the cell's cytoplasm and in the solution surrounding the cell

What will happen to red blood cells placed in a salt water solution?

Hypertonic: More water diffused \_\_\_\_\_ of the cells

Isotonic: Water diffused \_\_\_\_\_ in and out of the cells

Hypotonic: More water diffused \_\_\_\_\_ the cells

**Turgor pressure**

- the rigid cell wall of plant cells prevents them from \_\_\_\_\_ when they are filled with water
- water in vacuoles causes an outward push called \_\_\_\_\_ pressure
- plant cells swollen with water are said to be \_\_\_\_\_

**Plasmolysis**

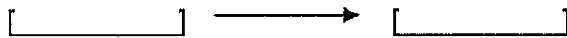
- when plant cells are placed in a salt solution, the cells shrink, this is called \_\_\_\_\_

### 3. Facilitated Diffusion

- some molecules are too \_\_\_\_\_ or are \_\_\_\_\_, & cannot pass go the phospholipids
- \_\_\_\_\_ proteins assist these molecules through the cell membrane (e.g. *glucose*)
- transport occurs with the concentration gradient (no \_\_\_\_\_ is required)

### B. Active Transport

- active transport is the movement of molecules through the cell membrane \_\_\_\_\_  
the concentration gradient using \_\_\_\_\_ proteins



- this process requires the use of cellular \_\_\_\_\_ (ATP)
- transport proteins are highly \_\_\_\_\_ (e.g.  $\text{Na}^+/\text{K}^+$  pump)

### C. Transport by Vesicles

#### a) Endocytosis:

- transport of material into a cell by means of \_\_\_\_\_
- cell \_\_\_\_\_ material by folding a portion of its membrane around it
- \_\_\_\_\_ is required
- \_\_\_\_\_ types of endocytosis:
  1. phagocytosis, cell \_\_\_\_\_;  
movement of \_\_\_\_\_ molecules and whole cells into the cell's interior
  2. pinocytosis: cell \_\_\_\_\_;  
transport of \_\_\_\_\_ into vesicles inside cell
  3. \_\_\_\_\_ endocytosis:  
molecules bind to \_\_\_\_\_ on cell's surface and are folded into vesicles within the cell

#### b) Exocytosis:

transport of macromolecules (e.g. hormones) \_\_\_\_\_ a cell by means of  
vesicles made by the \_\_\_\_\_ complex;  
\_\_\_\_\_ is required