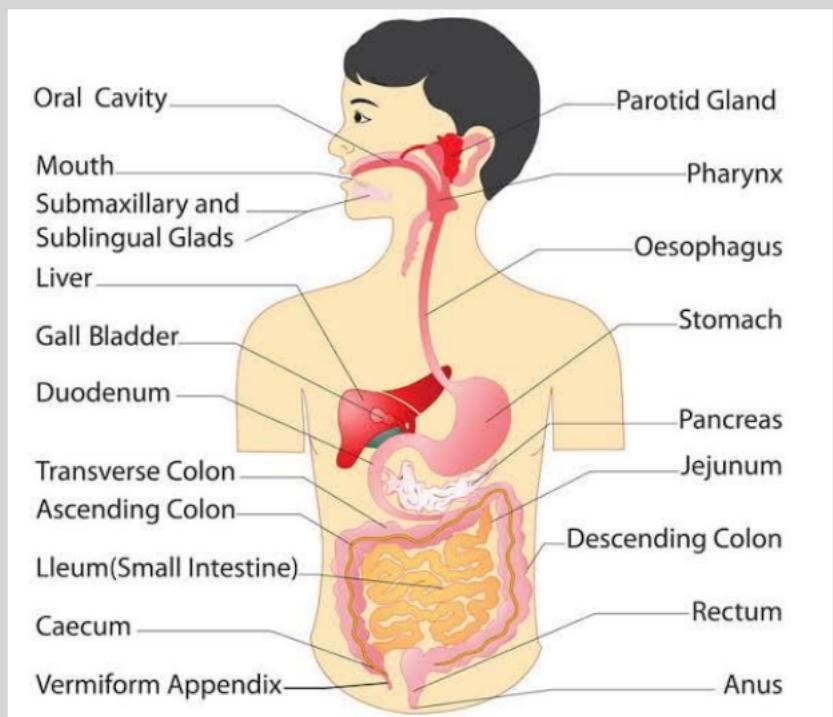
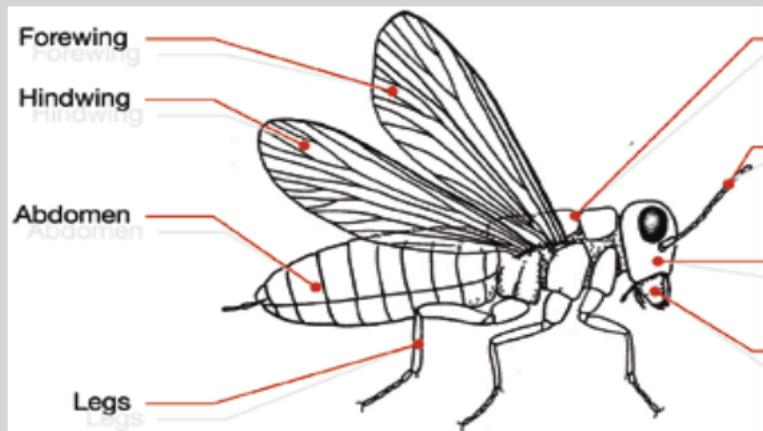


RANDOM SCIENCE DIAGRAMS



Organ	Function
Mouth	Food is mechanically digested here by cutting, chewing and grinding of teeth. Saliva is added – this contains amylase to begin the digestion of starch.
Oesophagus	Boluses (balls) of food pass through by peristalsis , from mouth to stomach.
Stomach	Muscular walls squeeze on food to make it semi-liquid. Gastric juice contains protease to digest protein and hydrochloric acid (HCl) to maintain an optimum pH (1-2.5). The acid also kills bacteria.
Duodenum	This is the first part of the small intestine, it receives pancreatic juice containing protease , lipase and amylase . The juice also contains sodium hydrogen carbonate, which neutralises acid from the stomach, producing a pH of 7-8.
Pancreas	Secretes pancreatic juice into the duodenum, also makes the hormones insulin and glucagon .
Liver	Makes bile , which is stored on the gall bladder. Bile contains salts that emulsify fats , forming droplets with a large surface area to make digestion by lipase more efficient. Digested foods are assimilated here. For example, glucose is stored as glycogen, surplus amino acids are deaminated.
Ileum	The second part of the small intestine. Enzymes in the epithelial lining break down lactose and peptides . Its surface area is increased by the presence of villi which allow the efficient absorption of digested food molecules.
Rectum	This stores faeces until it is egested.
Anus	This has muscles to control when faeces is egested from the body.

FUNCTIONS OF BLOOD

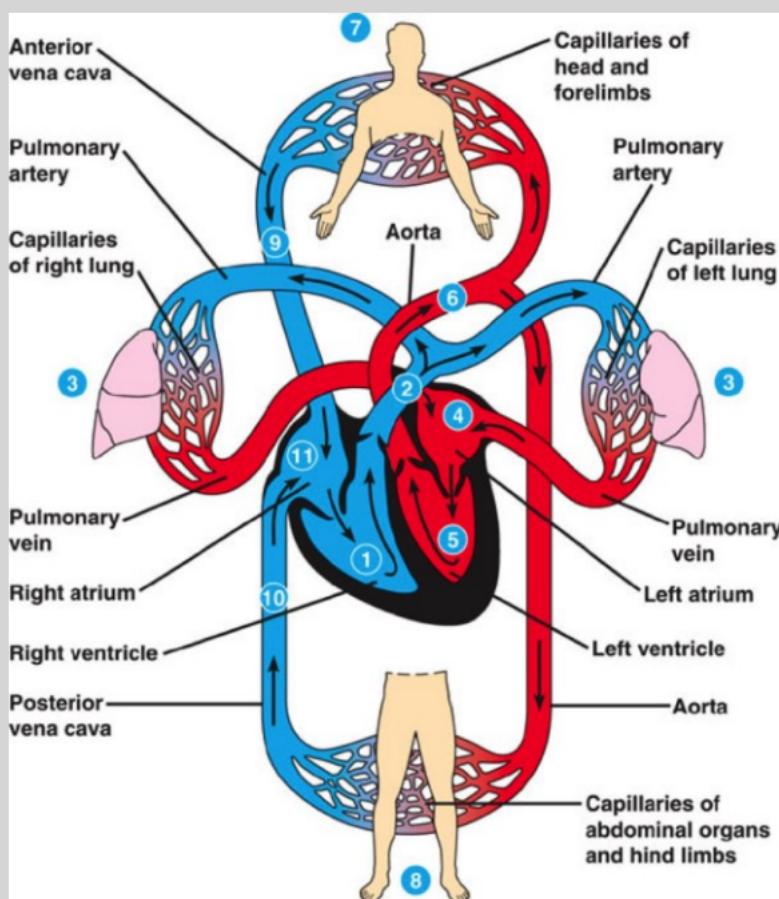
TRANSPORTATION	REGULATION	PROTECTION
<ul style="list-style-type: none"> • Respiration • Nutrient carrier from GIT • Transportation of hormones from endocrine glands • Transports metabolic wastes 	<ul style="list-style-type: none"> • Regulates pH • Adjusts and maintains body temperature • Maintains water content of cells 	<ul style="list-style-type: none"> • WBC protects against disease by phagocytosis • Reservoir for substances like water, electrolyte etc. • Performs haemostasis

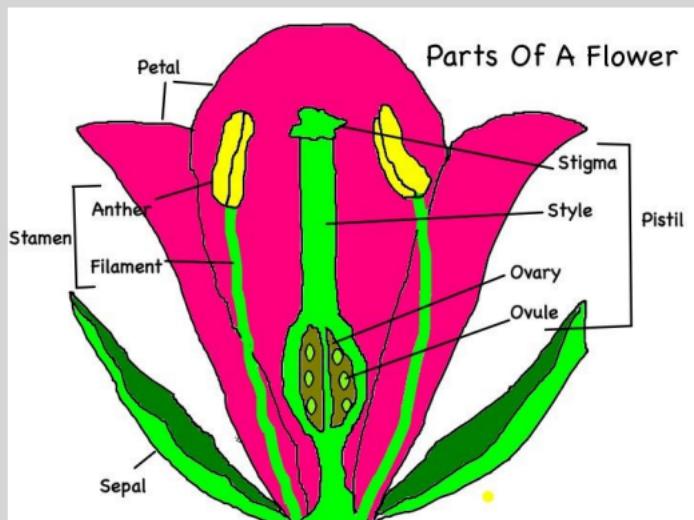
Blood composition

55% Plasma (fluid matrix of water, salts, proteins, etc.)

45% Cellular elements:

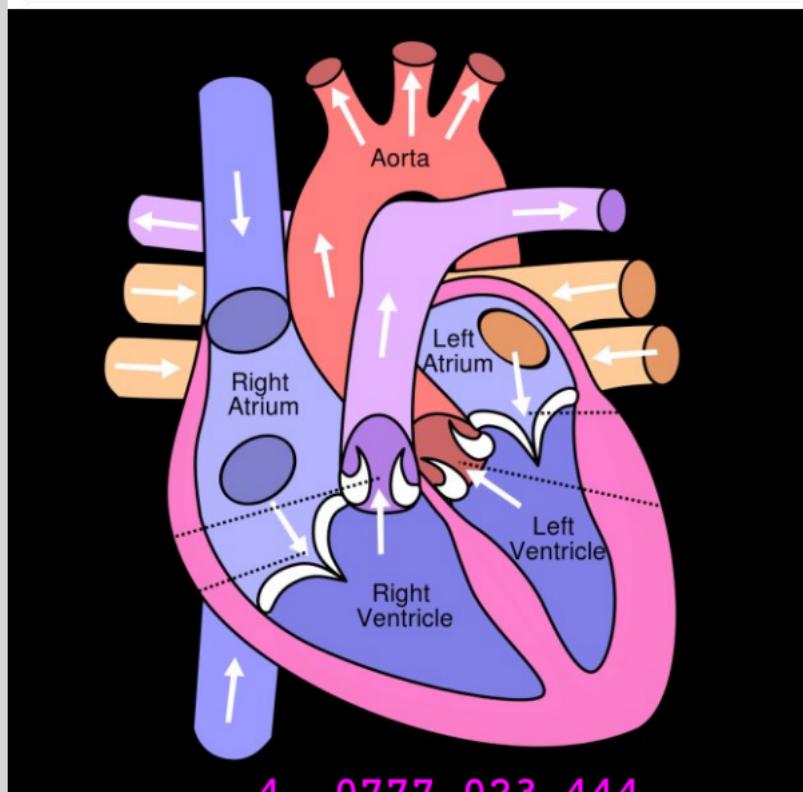
- **Red Blood Cells (RBCs):** 5-6 million RBCs/ml of blood. Contain hemoglobin which transport oxygen and CO₂.
- **White Blood Cells (WBCs):** 5,000-10,000 WBCs/ml of blood. Play an essential role in immunity and defense. Include:
 - **Lymphocytes:** T cells and B cells
 - **Macrophages:** (phagocytes)
 - **Granulocytes:** Neutrophils, basophils, and eosinophils.
- **Platelets:** Cellular fragments, 250,000- 400,000/ml of blood. Important in blood clotting.



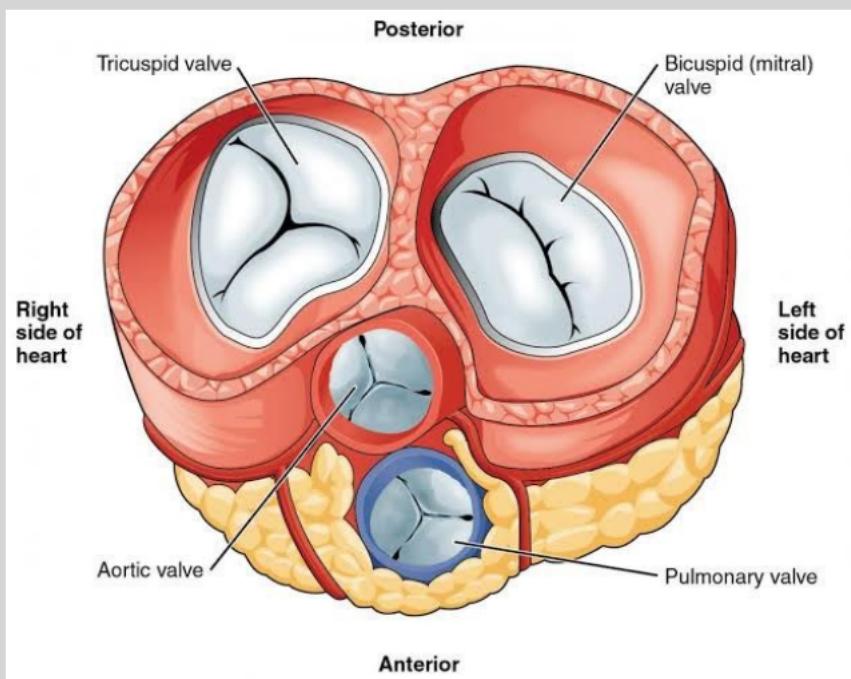


Functions of parts of a flower

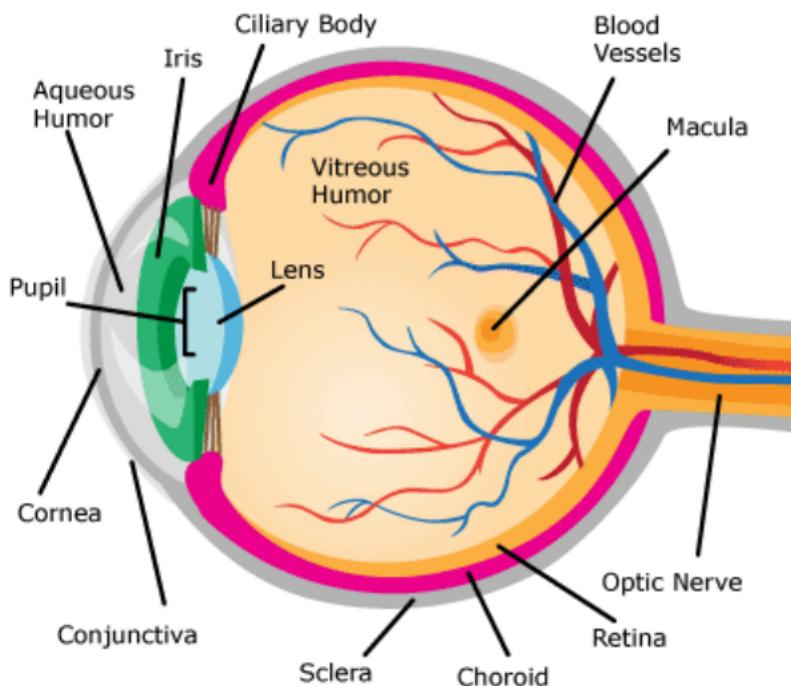
Part	Function
1 Petal	Often large and coloured, to attract insects
2 Sepal	Protects the flower while in bud
3 Petiole (stalk)	Supports the flower to make it easily seen by insects, and to be able to withstand wind
4 Nectary	Produces nectar, to attract insects
5 Stamen	The male reproductive part of the flower, made up of anther and filament
6 Anther	Contains pollen sacs, in which pollen grains are formed. Pollen contains male sex cells.
7 Filament	Support the anther
8 Carpel	The female reproductive part of the flower, made up of stigma, style and ovary
9 Stigma	A sticky surface to the ovary, through which pollen tubes grow
10 Style	Links the stigma to the ovary, through which pollen tubes grow
11 Ovary	Contains ovules, which develop into seeds when fertilised.



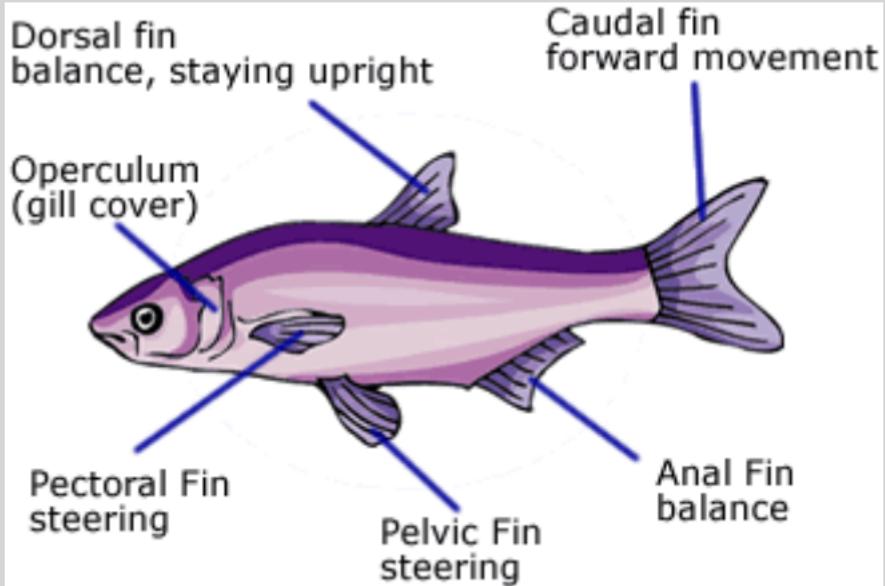
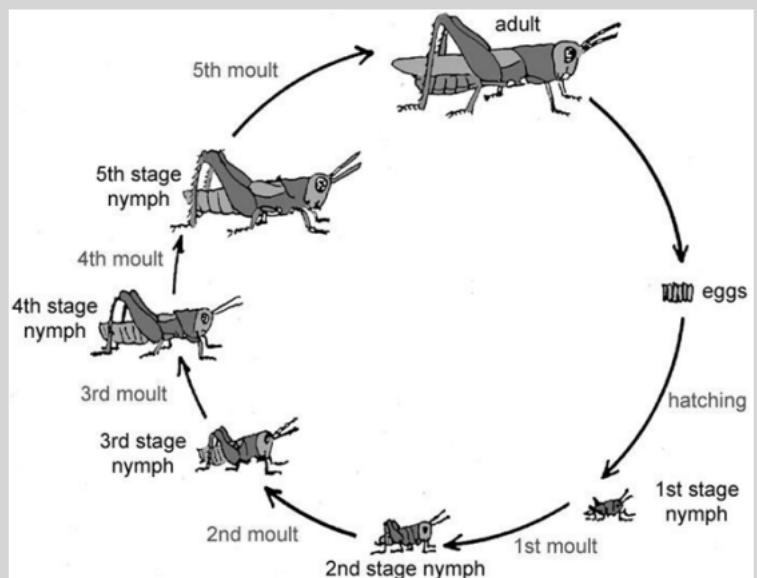
Structure	Where it is located	Describe its role
Left Ventricle	The bottom chamber on the left side of the heart	To pump oxygenated blood to the aorta to go around the body and to the brain
Right Ventricle	The bottom chamber on the right side of the heart	Pumps deoxygenated blood to the pulmonary vein
Left Atrium	The top chamber on the left side of the heart	Collect the oxygenated blood from the pulmonary vein and push it through to the left ventricle
Right Atrium	The top chamber on the right side of the heart	Collect the deoxygenated blood from the vena cava and push it through to the right ventricle.
Aorta	Tube on top of the left side of the heart	Pump oxygenated blood to the brain and the rest of the body from the left ventricle.
Pulmonary Vein	Tube on the far left on top of the heart	Take the freshly oxygenated blood from the lungs to the left atrium.
Pulmonary Artery	Tube on the right of the aorta	Take deoxygenated blood from the right ventricle to the lungs to get oxygen
Vena Cava	Tube on the far right on top of the heart	Give deoxygenated blood back to the heart from around the body and the brain.
Valves	In between the ventricles and the atriums	Make sure blood only flows in one direction.
Coronary Artery	On the surface of the heart	Carry nutrients and oxygen to the heart muscle.
Septum	Muscle wall separating the right and left sides of the heart	Separate the right and left chambers on the heart.



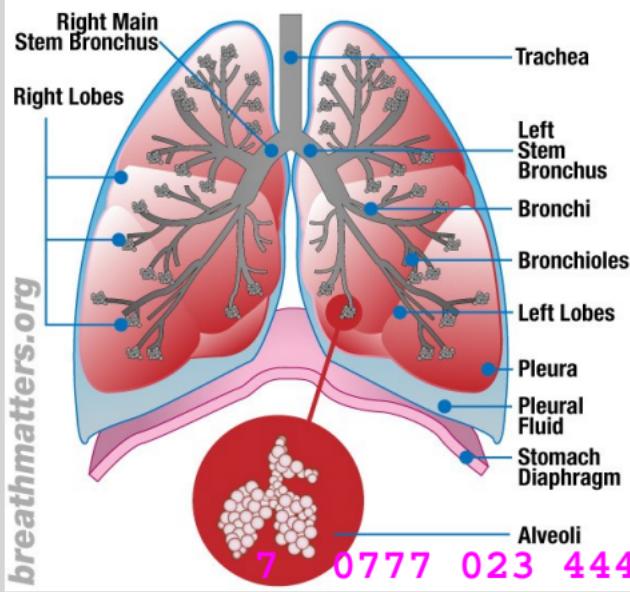
Body Basics: The Eye



Part	Function
Sclera	Protect and maintains shape of eye ball
Choroid	-Blood vessels supply nutrients & oxygen -Black pigment absorb light
Retina	Detects light and produces nerve impulses
Cornea	Refract light onto retina
Conjunctiva	Protects cornea
Iris	Controls the size of the pupil
Pupil	Controls amount of light entering eye

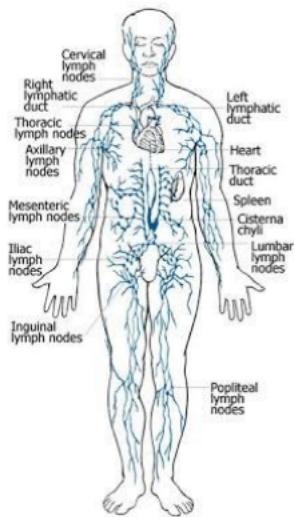


LUNGS

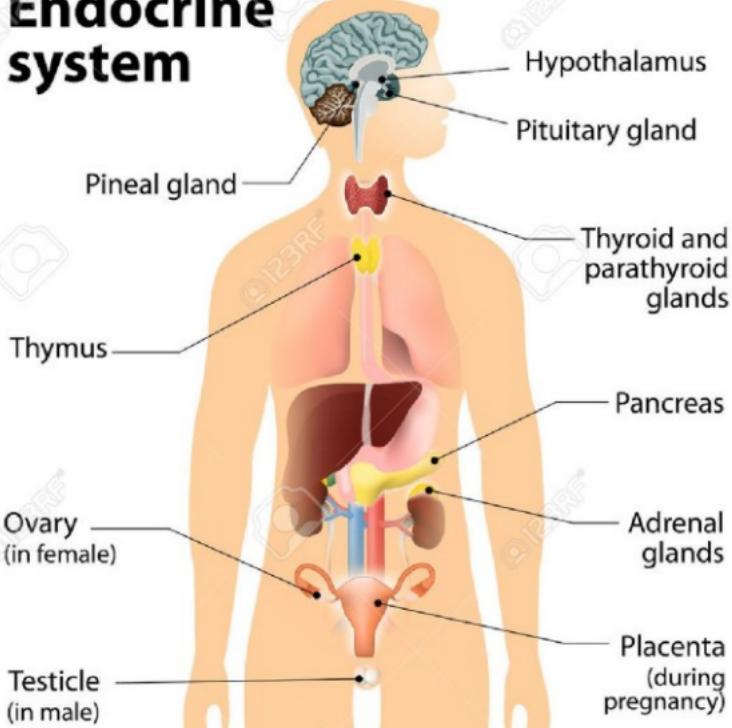


The Lymphatic System

- Two parts
 - Lymphatic vessels
 - Lymphoid tissues and organs
- Lymphatic system functions
 - Transport fluids back to the blood
 - Play essential roles in body defense and resistance to disease
 - Absorb digested fat at the intestinal villi



Endocrine system



Features of the villi

Thin epithelium

The skin of each villus is only one cell thick, this allows absorption to happen very fast.

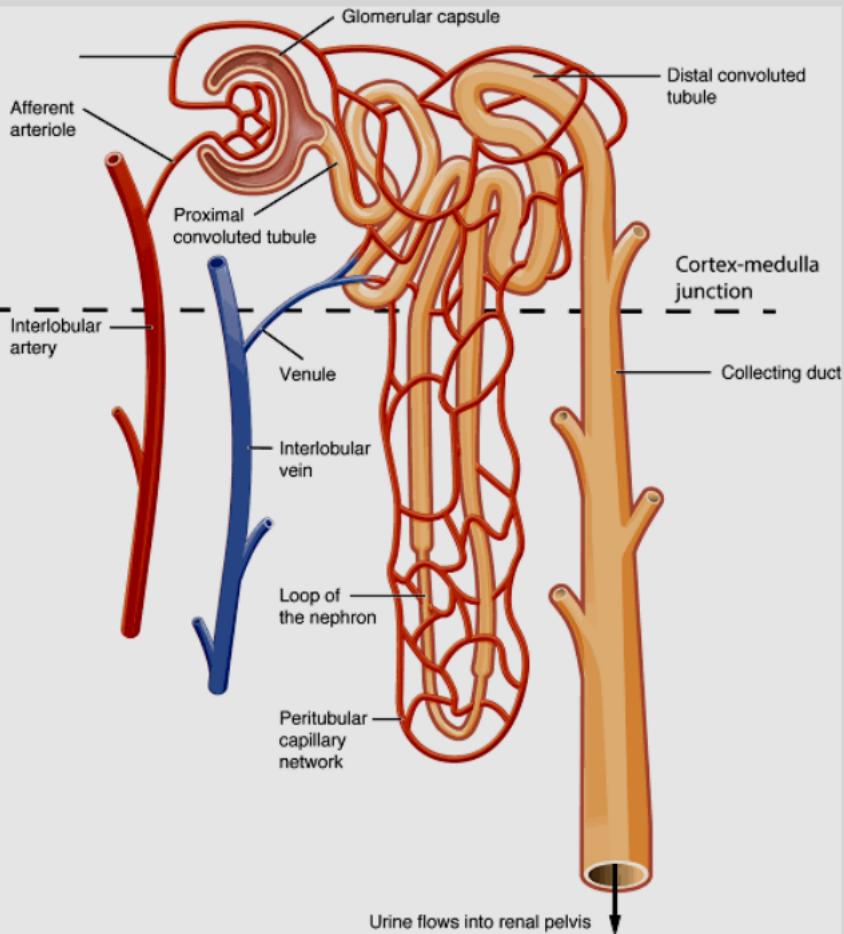
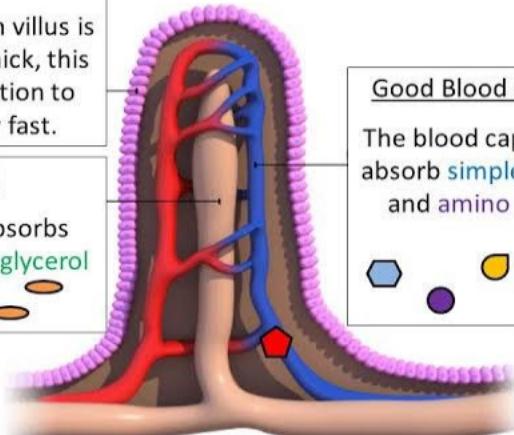
Lacteal

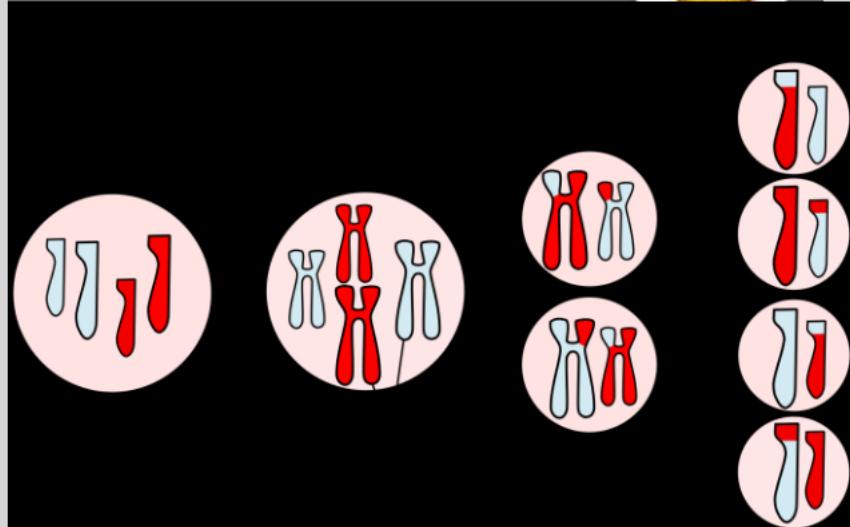
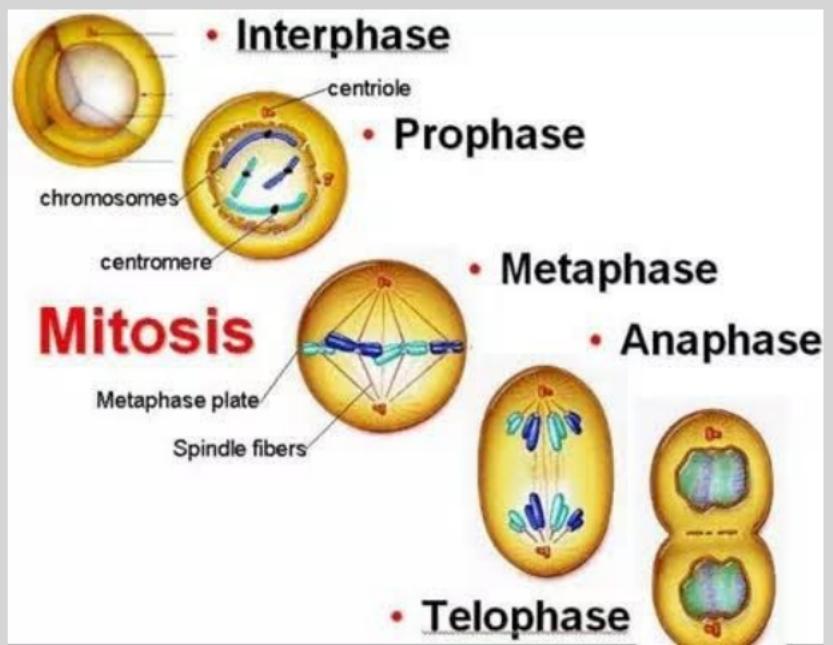
The lacteal absorbs fatty acids and glycerol



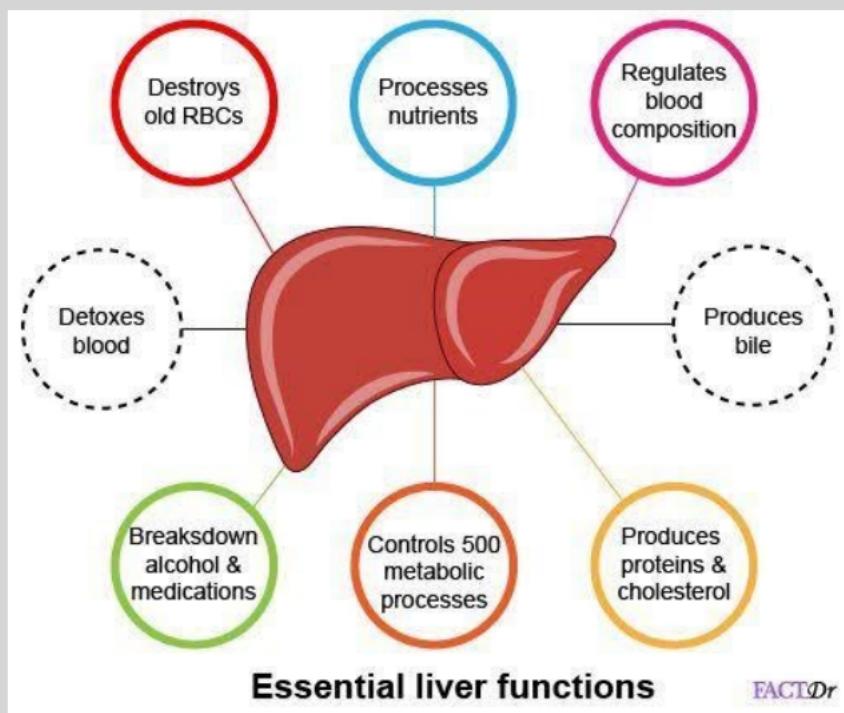
Good Blood Supply

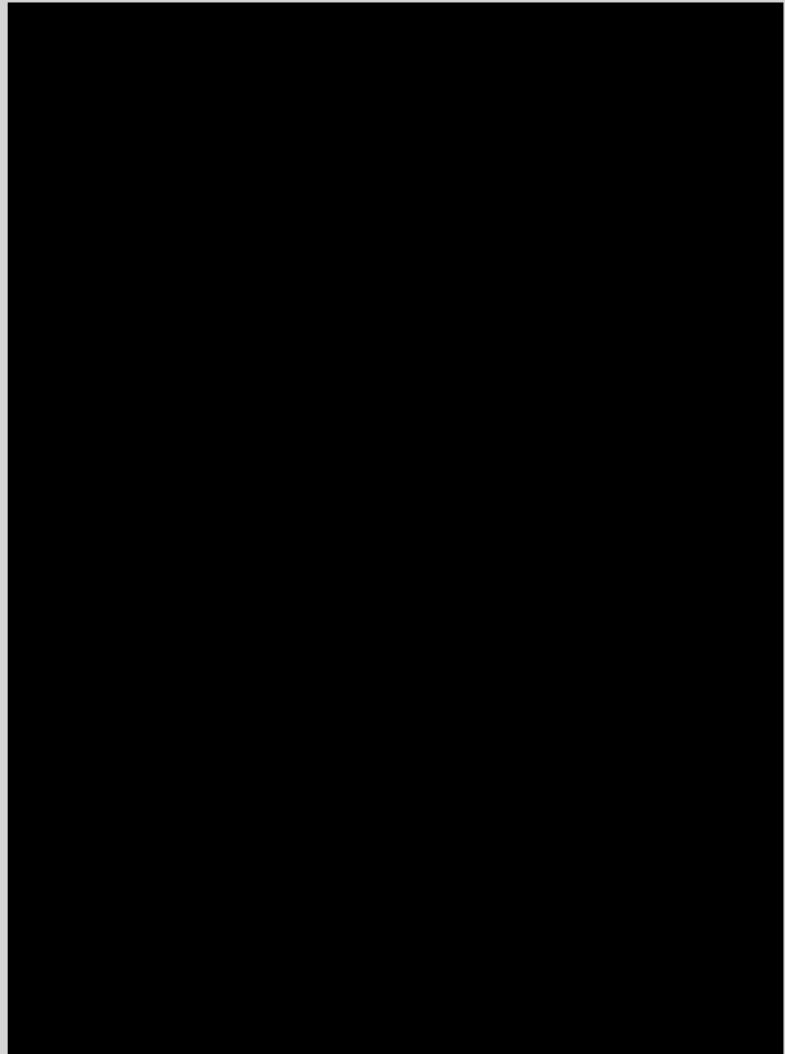
The blood capillaries absorb simple sugars and amino acids





S.no.	Characteristics	Mitosis	Meiosis
1.	Type of parent cells	Occurs in all the <u>somatic cells</u> .	Occurs only <u>in reproductive cells</u> to form <u>gametes</u> .
2.	Ploidy	The daughter cells have the <u>same number of chromosomes</u> as the parent cell i.e. ploidy remains same.	The daughter cells have half the number of chromosomes than the parent cells and hence are called haploids.
3.	Number of daughter cells	1 Mitotic division gives rise to 2 daughter cells	1 meiotic division gives rise to 4 daughter cells.
4.	Phases	It consists of only one phase that has 4 stages- prophase, metaphase, anaphase, and telophase.	It consists of two phases- meiosis I and meiosis II.
5.	Type of daughter cells	The daughter cells formed are identical to the parent cells.	The daughter cells formed have changed due to the crossing over that takes place between homologous chromosomes.
6.	Type of division	Since the number of chromosomes in daughter cells is equal to the parent, it is also called equational division.	Since the number of chromosomes is reduced to half in daughter cells, this type of division is also called reduction division.



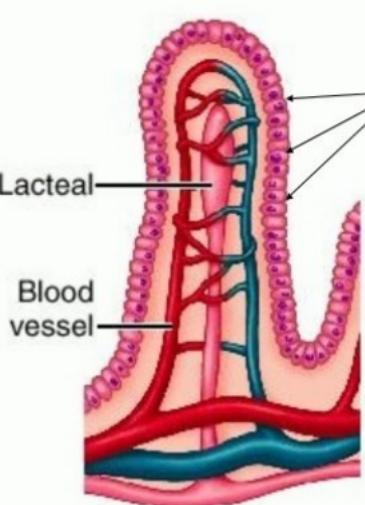


Digestive Tract: Jejunum

Villi:

-finger-like projections of the small intestine lining

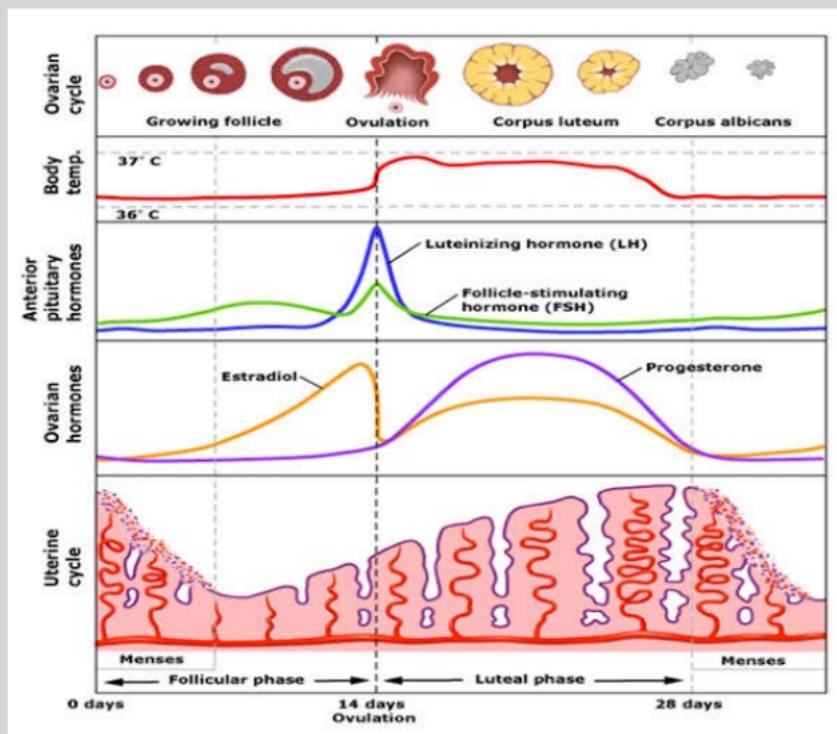
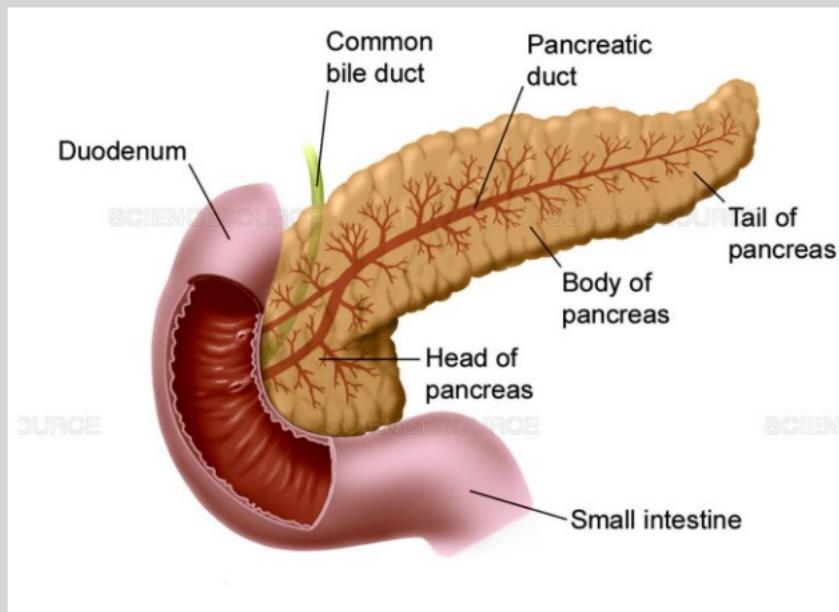
- More surface area to absorb nutrients.

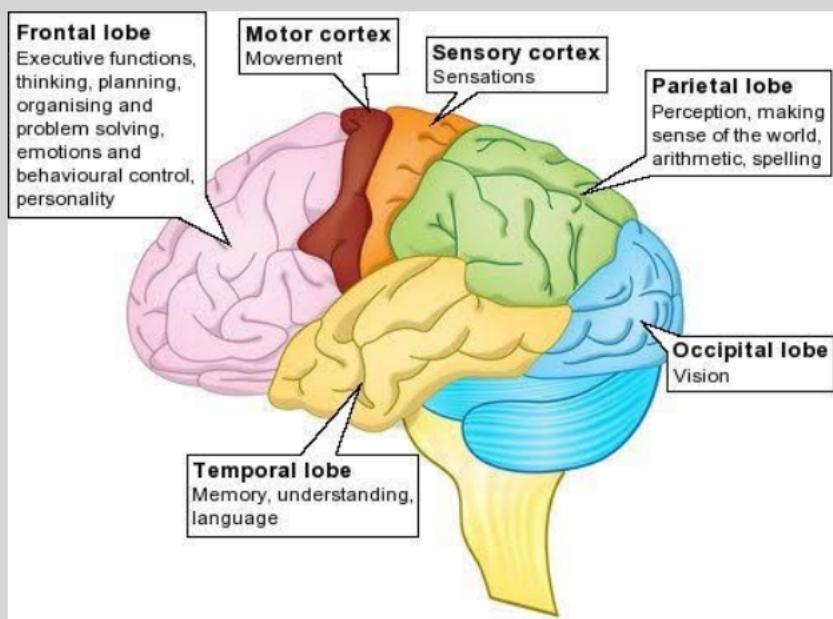
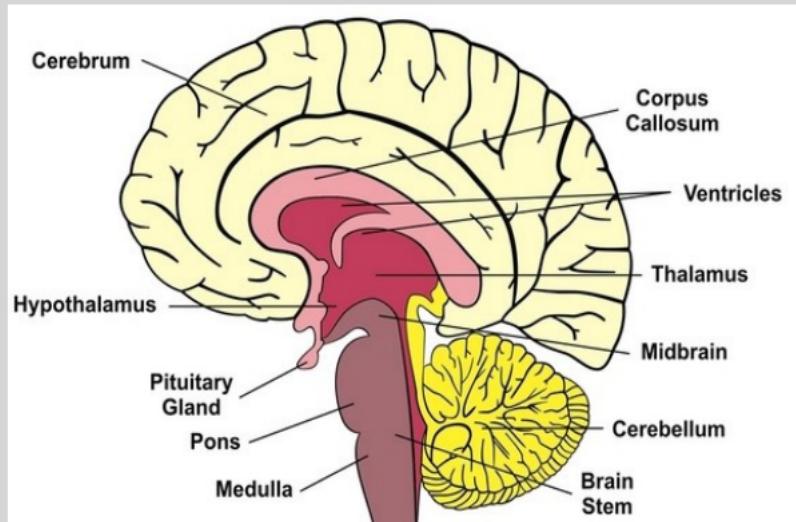


The cells lining each villus can perform

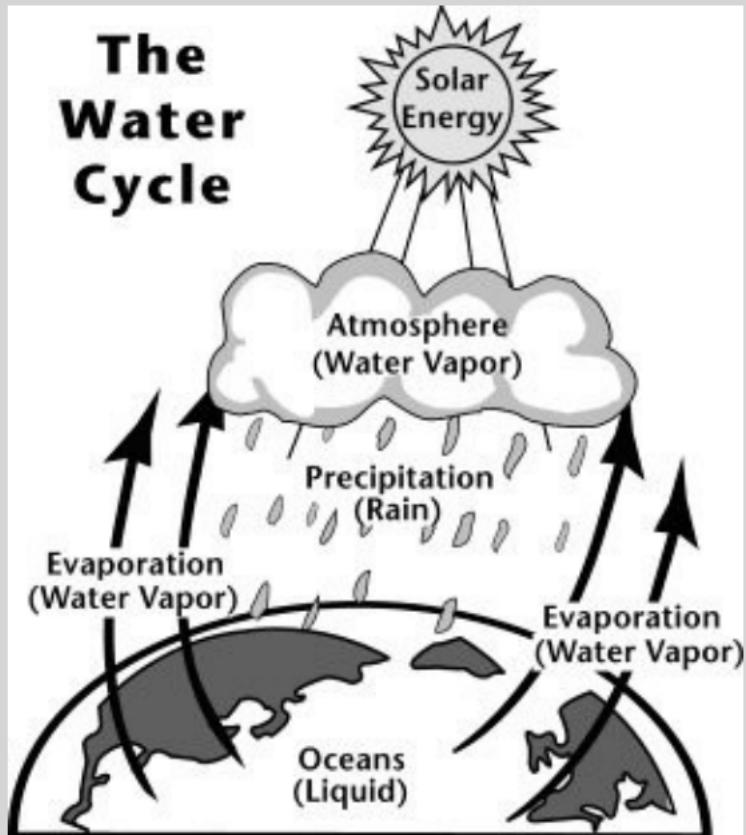
Active transport
(transport of nutrients requiring energy)

Passive transport
(transport of nutrients not requiring energy)



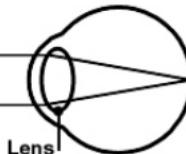


The Water Cycle



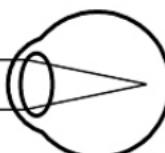
Normal eye

Light rays



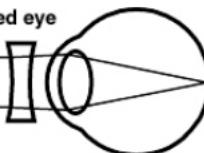
Light focuses on retina

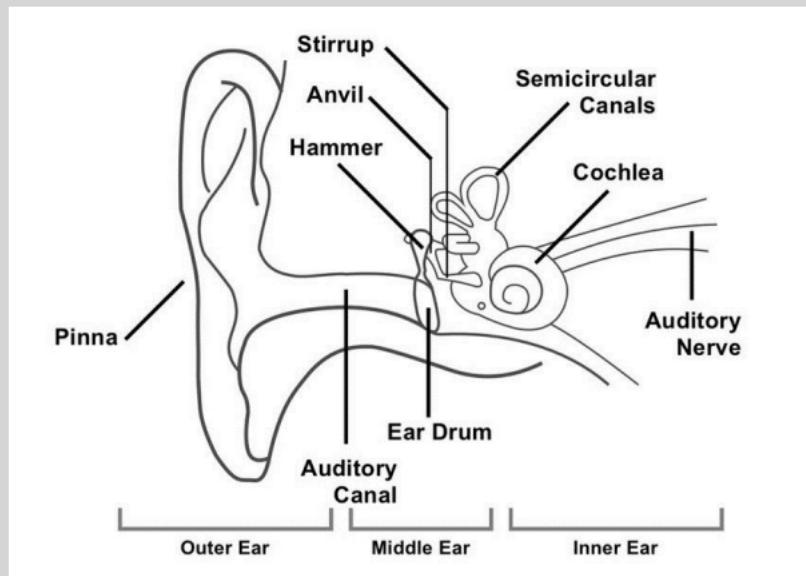
Short sighted eye



Light focuses in front of retina

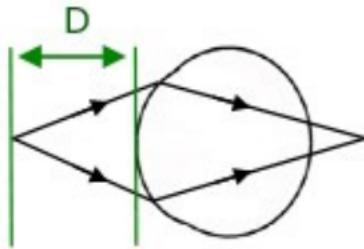
Corrected short sighted eye

Concave lens in glasses
adjusts the focus of light rays to fall on the retina

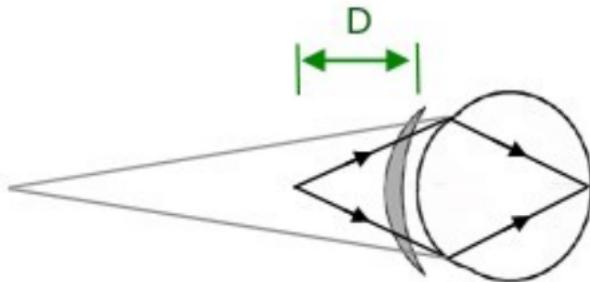
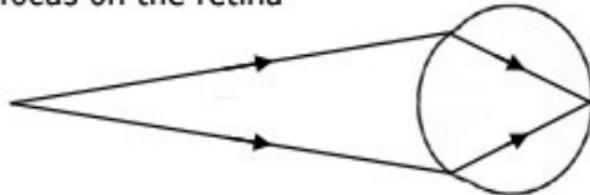


	Part	Function
Outer ear	Pinna	Collects and directs sound wave to ear canal
	Ear canal	Directs sound waves to eardrum
Middle ear	Eardrum	Vibrates when sound waves hit it
	Ossicles	Amplify vibrations
	Oval window	Transfer vibrations to cochlea
	Eustachian Tube	Equalises air pressure
Inner ear	Cochlea	Detects vibrations and convert to nerve impulses
	Auditory nerve	Carries nerve impulses to brain
	Semicircular canal	Help in body balance

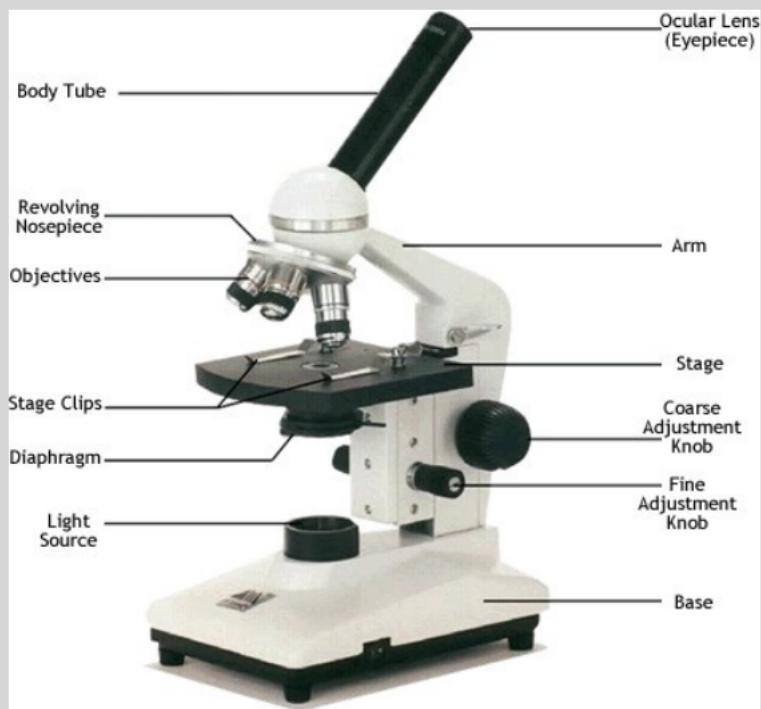
image formed behind the eyeball at the near point

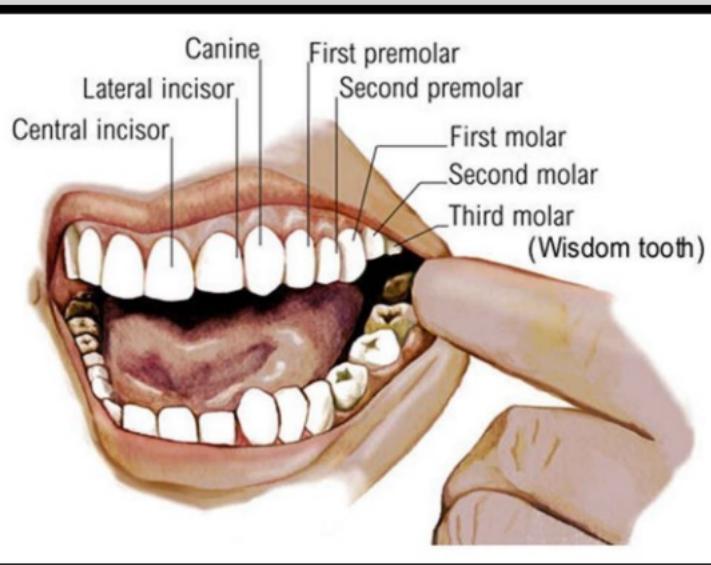
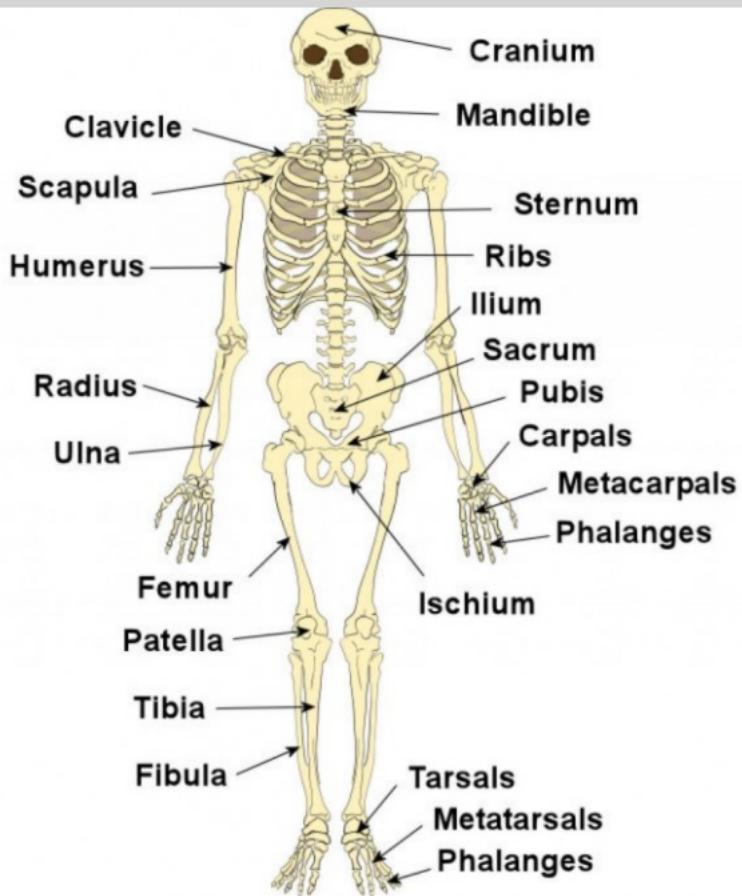


object further away than the near point,
in focus on the retina

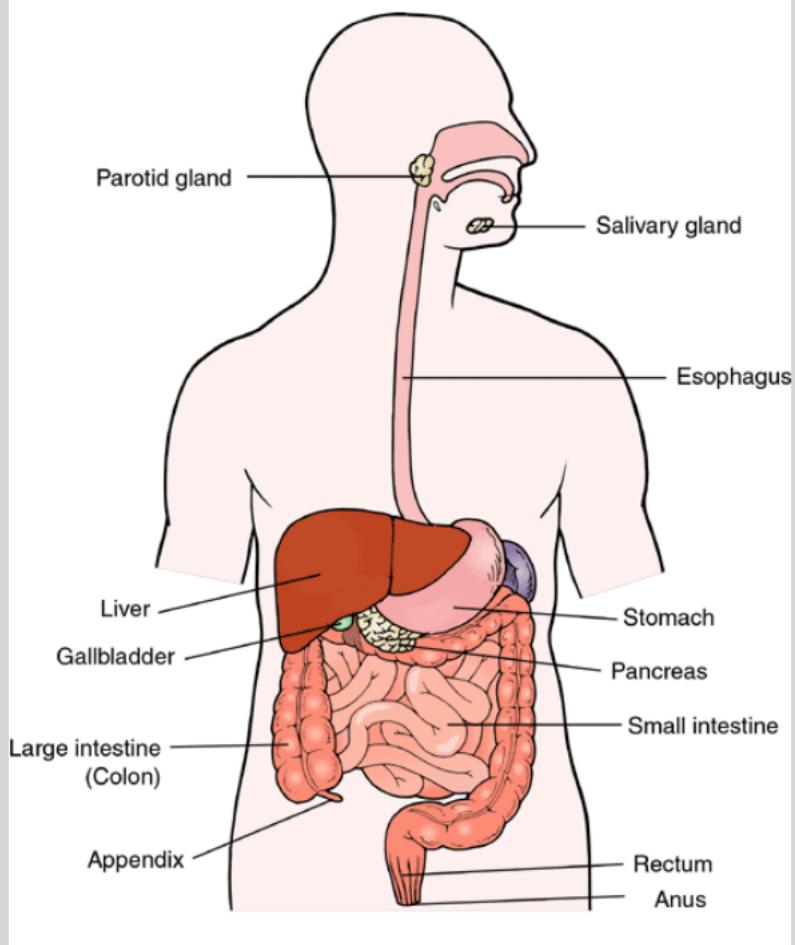


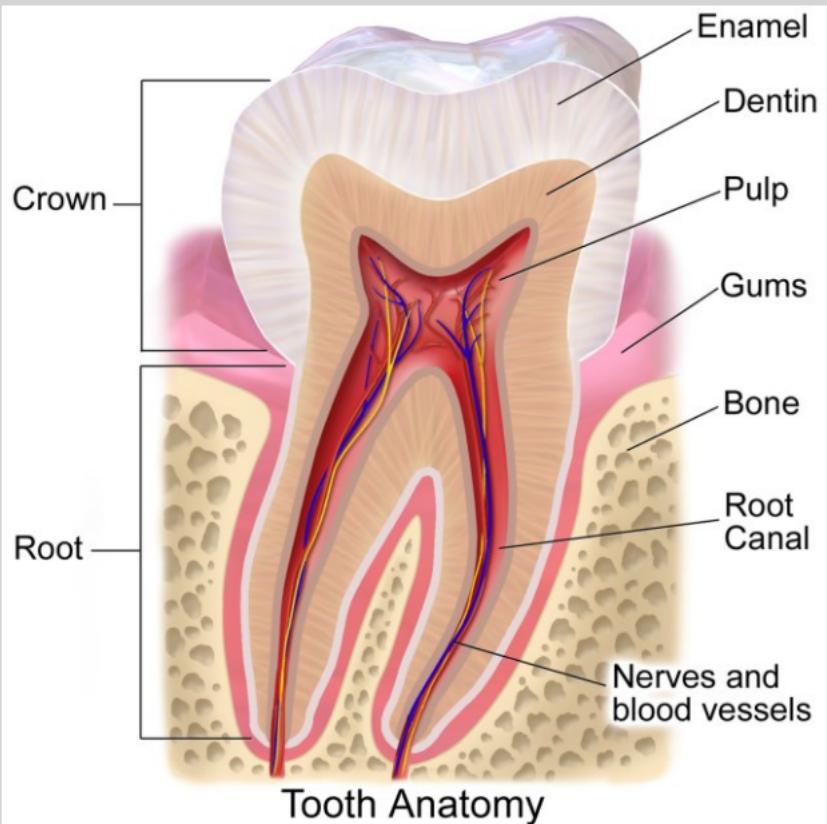
correction of long sight using a convex lens



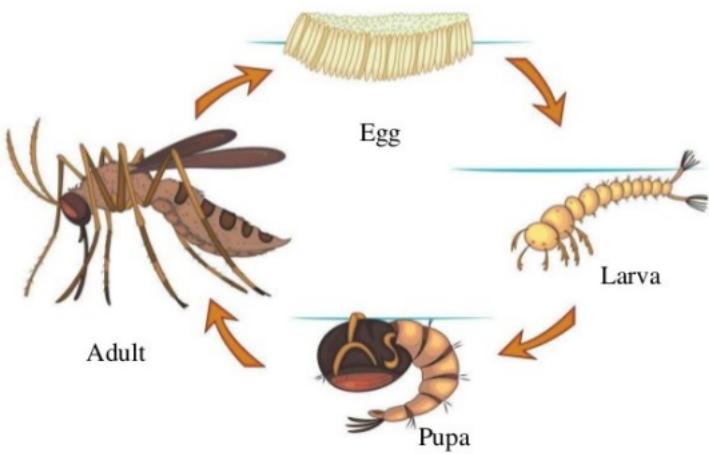


Digestive System





Life cycle of mosquito



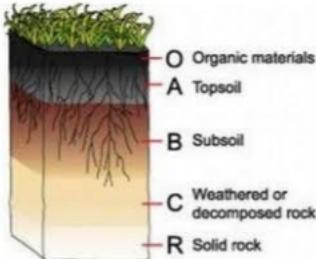
Soil profile

Vertical section of earth crust (~6 feet) – soil profile.

- Structure, thickness, consistency, texture, porosity, colour, chemical composition.
- Soil profile vary from place to place
- Depends on climate, vegetation and parent rock
- Top soil thicker in forest

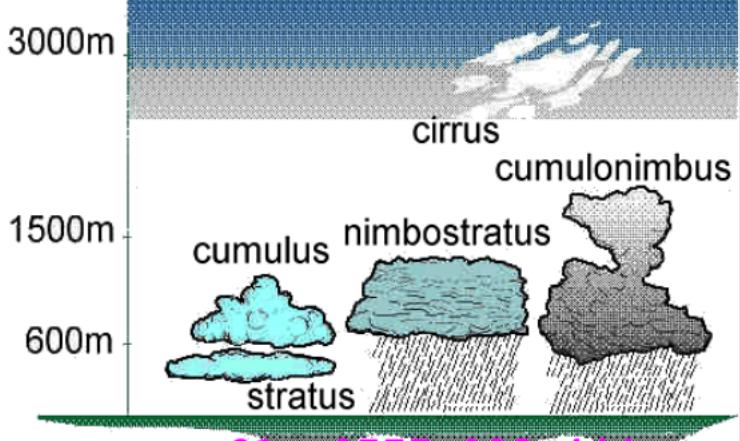
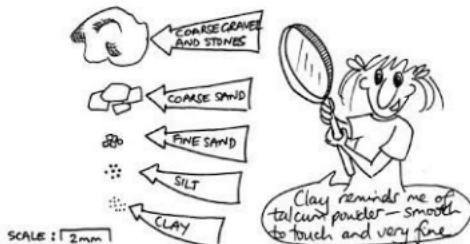
Layers of soil is Horizons- 6 horizons.

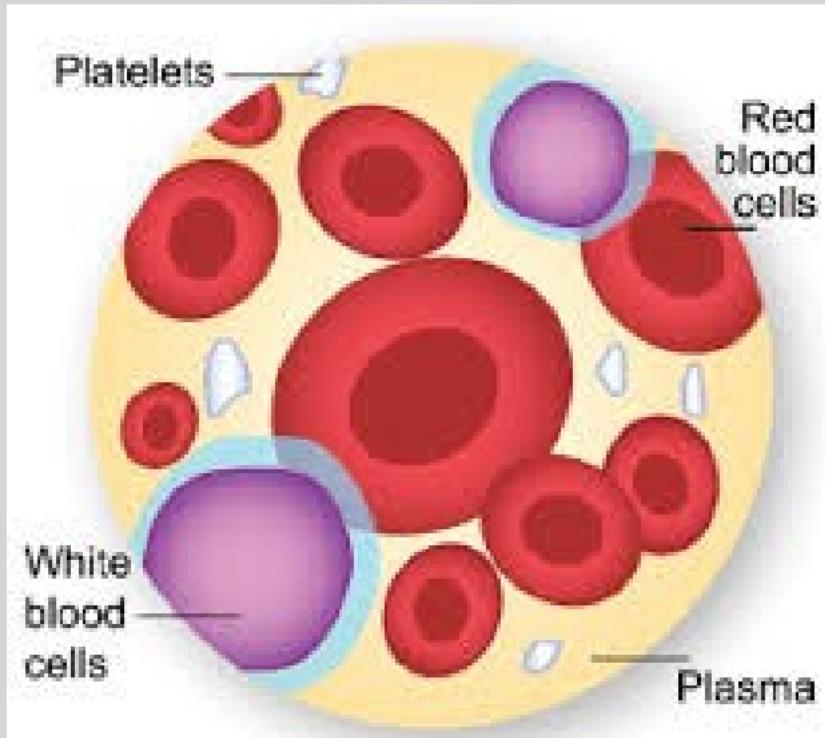
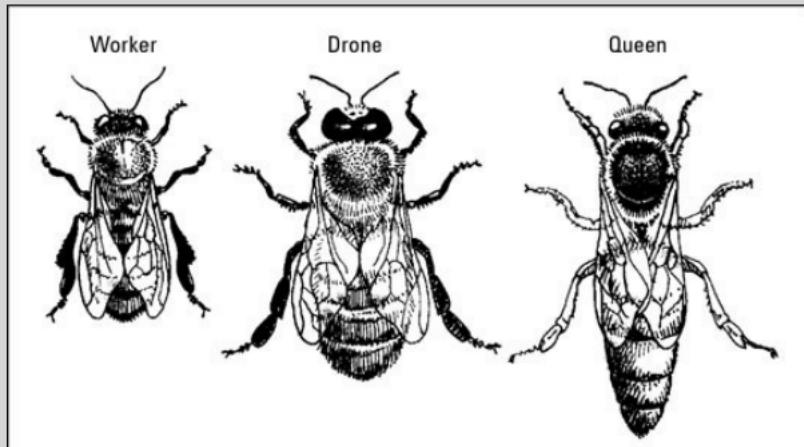
- 1) O-horizon (organic horizon or litter zone)
- 2) A-horizon (top soil)
- 3) B-horizon (sub soil)
- 4) C-horizon (weathering rock)
- 5) D-horizon (weathering rock)
- 6) R-horizon (bed rock)



What makes up a fertile soil?

- A fertile soil is one that will maintain life, and is made up of minerals, organic matter, water, air and living organisms.

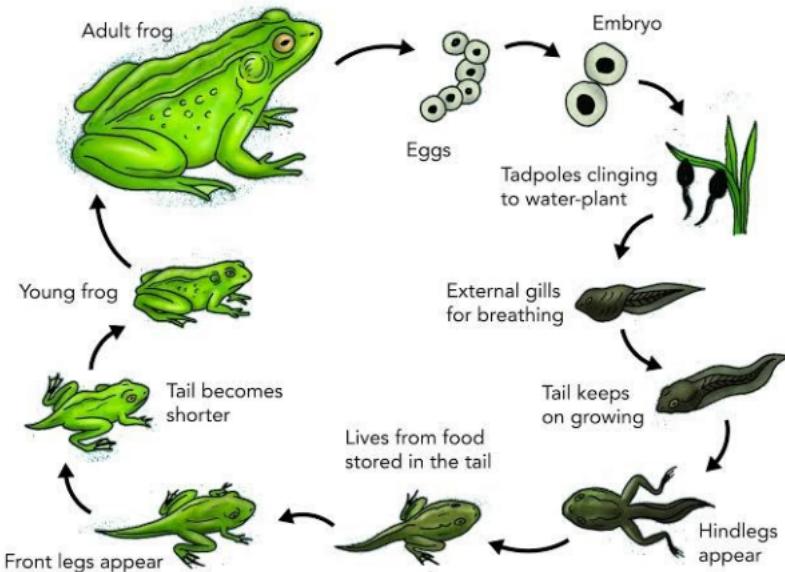
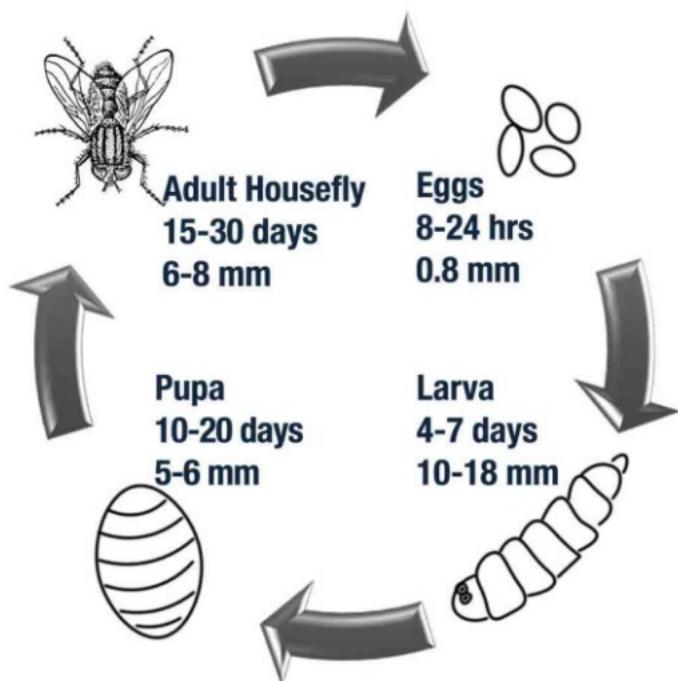


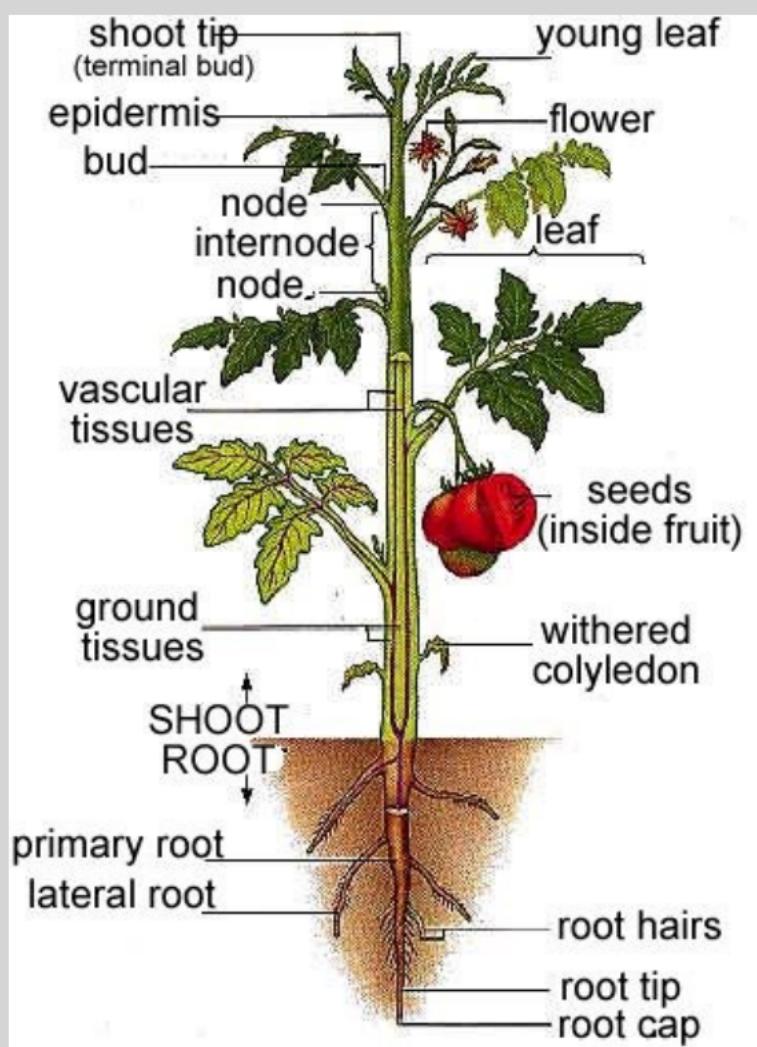
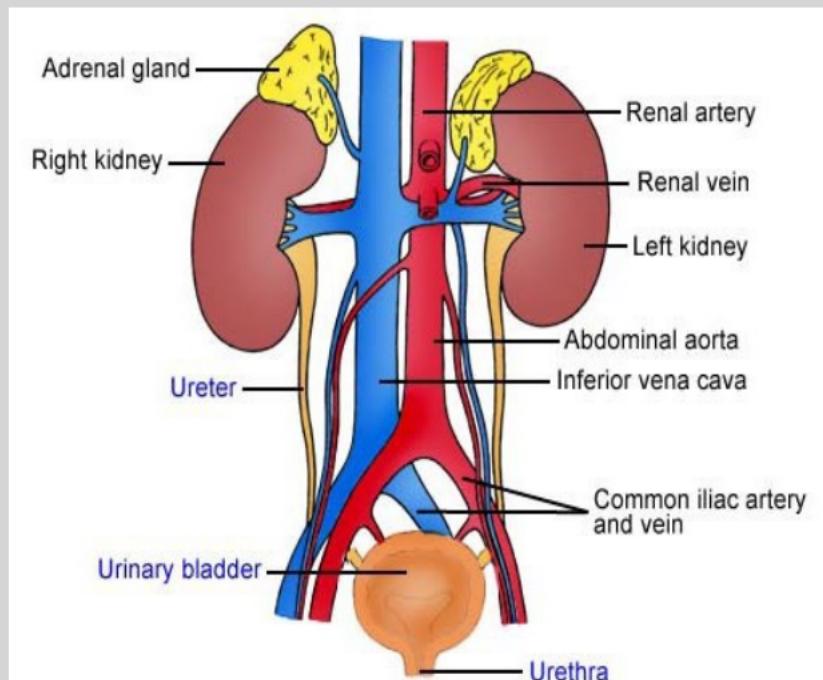


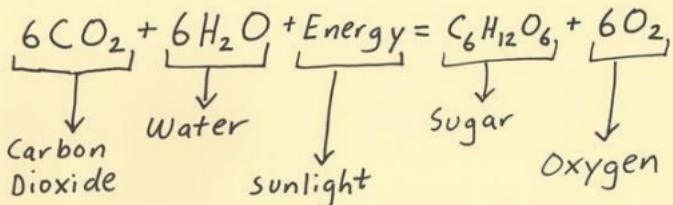
Blood Group	Gives to these groups	Receives from these groups
O ⁻	All	O- only
O ⁺	AB+, A+, B+, O+	O- and O+
A ⁻	AB-, AB+, A+, A-	O- and A-
A ⁺	AB+ and A+	O-, O+, A-, A+
B ⁻	B-, B+, AB-, AB+	O- and B-
B ⁺	B+ and AB+	O-, O+, B-, B+
AB ⁻	AB- and AB+	O-, A-, B-, AB-
AB ⁺	AB+ only	All

		Father's Blood Type				Child's Blood Type
		A	B	AB	O	
Mother's Blood Type	A	A or O	A,B,AB or O	A,B,or AB	A or O	
	B	A,B,AB or O	B or O	A,B,or AB	B or O	
	AB	A,B,or AB	A,B,or AB	A,B,or AB	A or B	
	O	A or O	B or O	A or B	O	

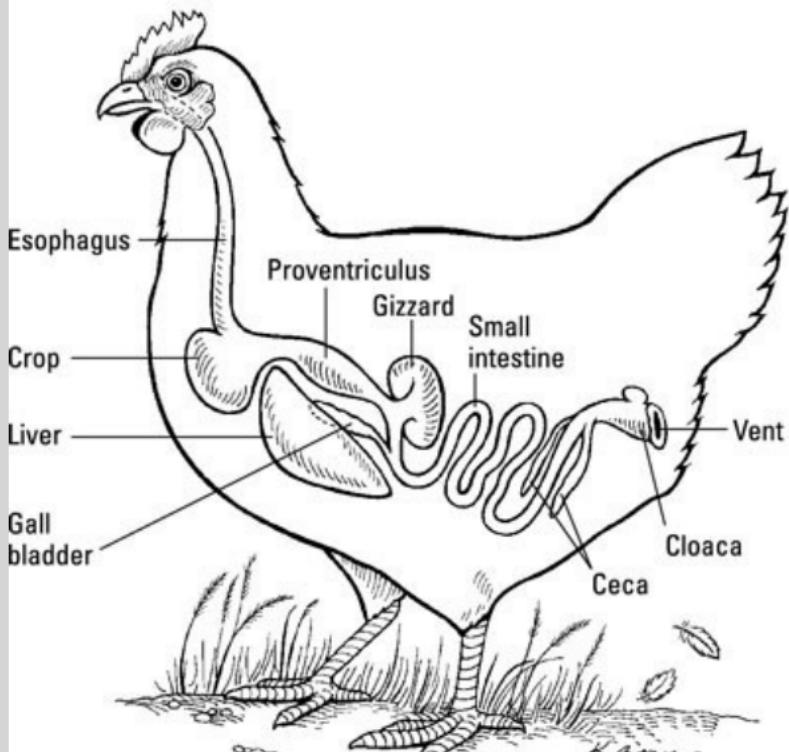
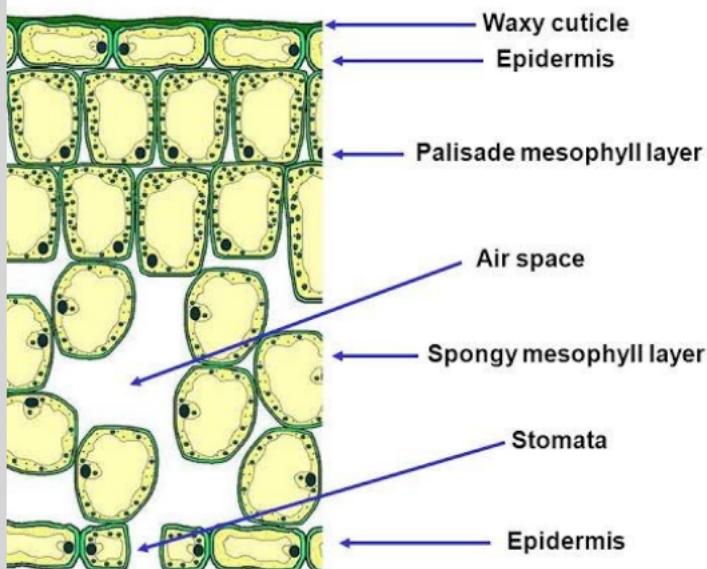
Life Cycle of a Housefly

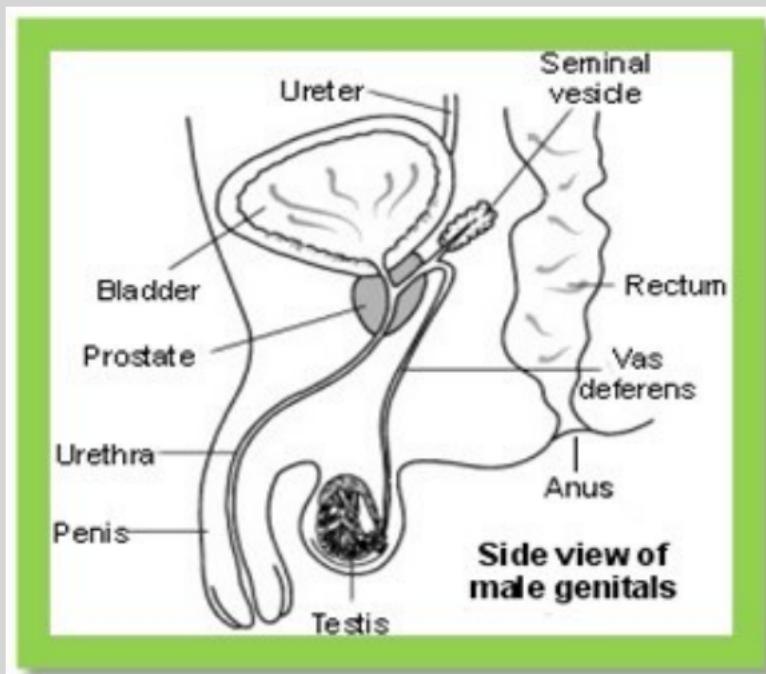
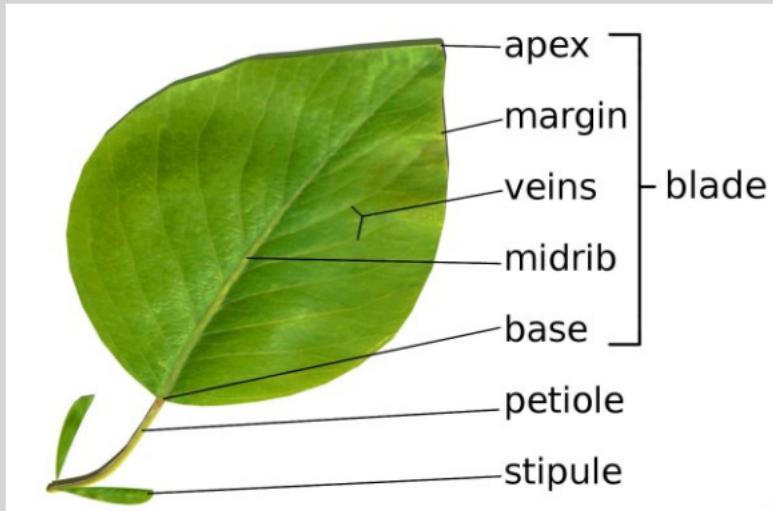


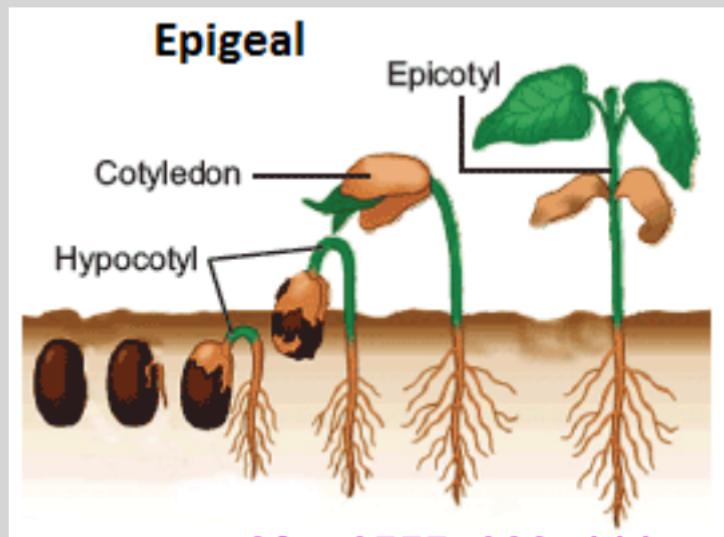
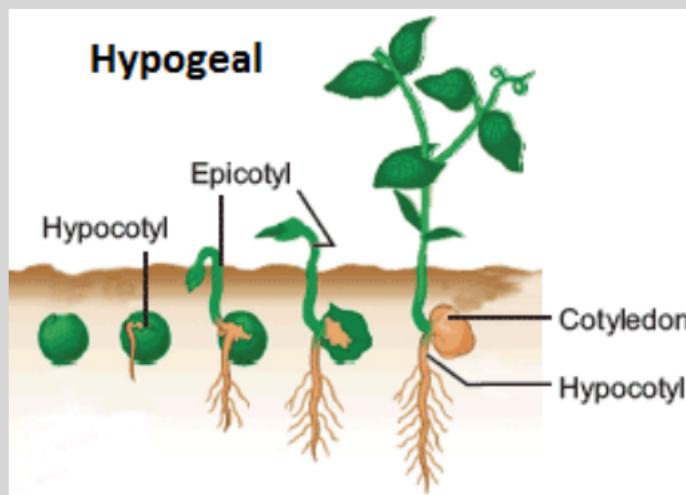
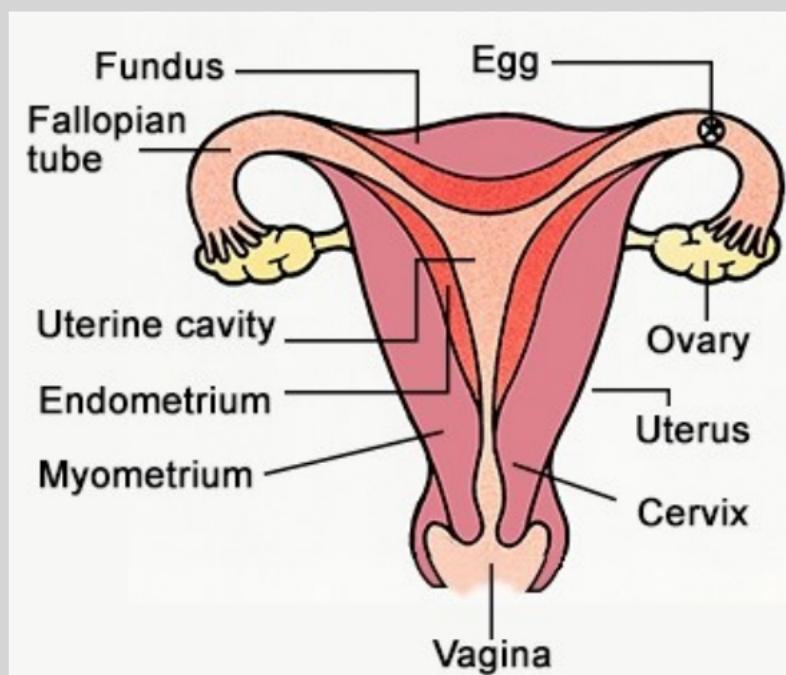


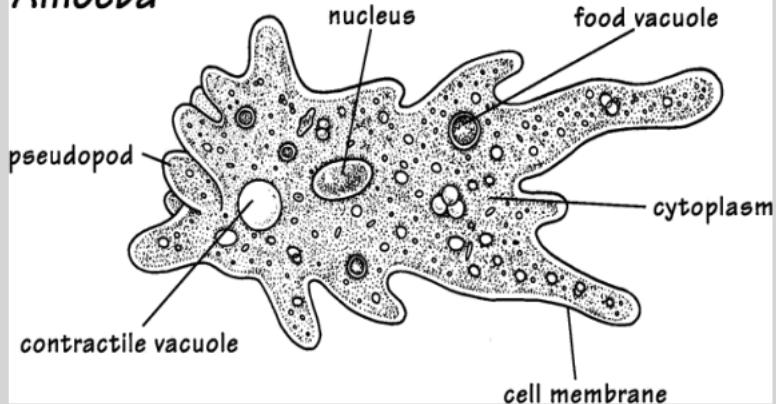
PhotosynthesisLeaf Structure

JH







Amoeba**LEAF TYPES**

Opposite



All basal



Alternate



Whorled

Toothed



Not toothed



Entire



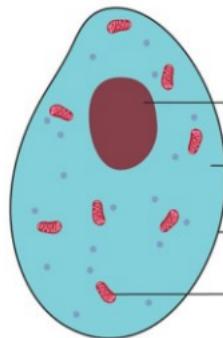
Lobed



Pinnate



Palmate

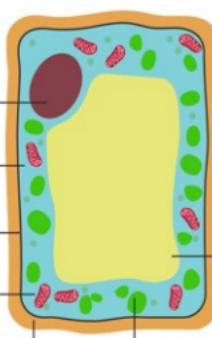
Simple**Compound****Animal cell**

Nucleus

Cytoplasm

Cell membrane

Mitochondria

Plant cell

Vacuole

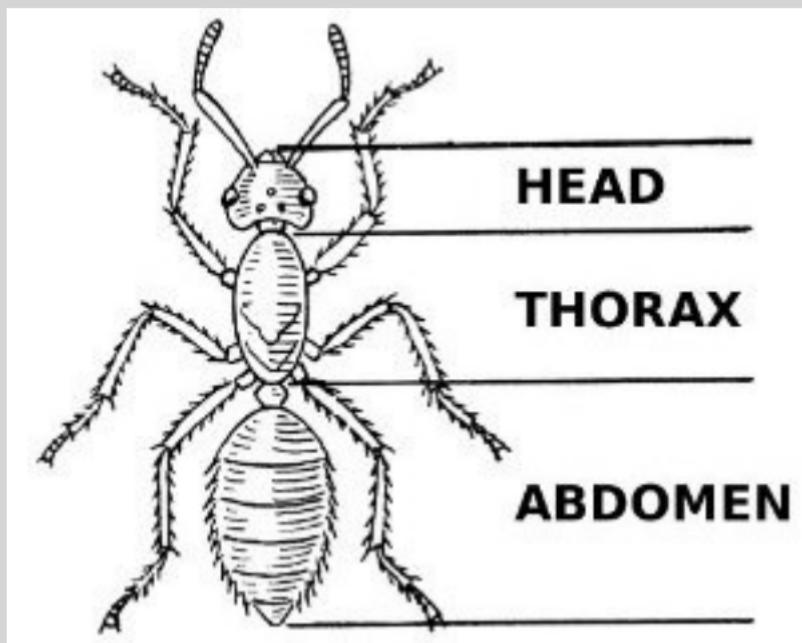
Cell wall

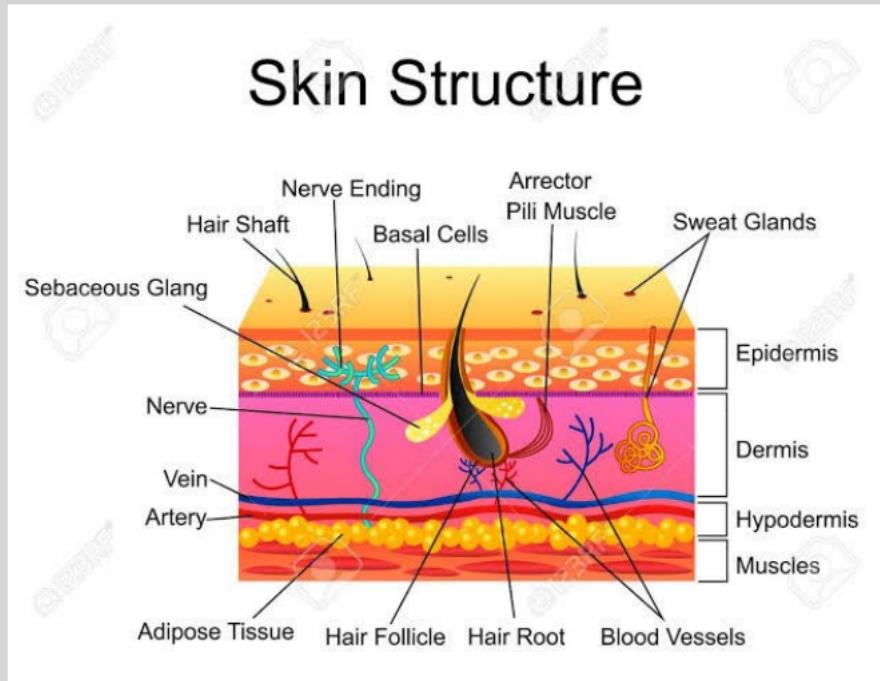
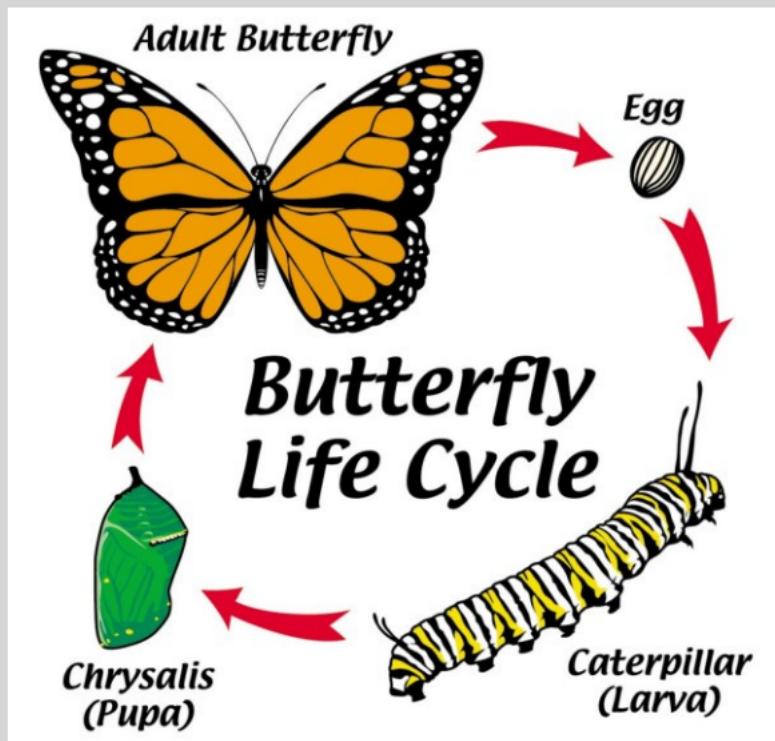
Chloroplasts

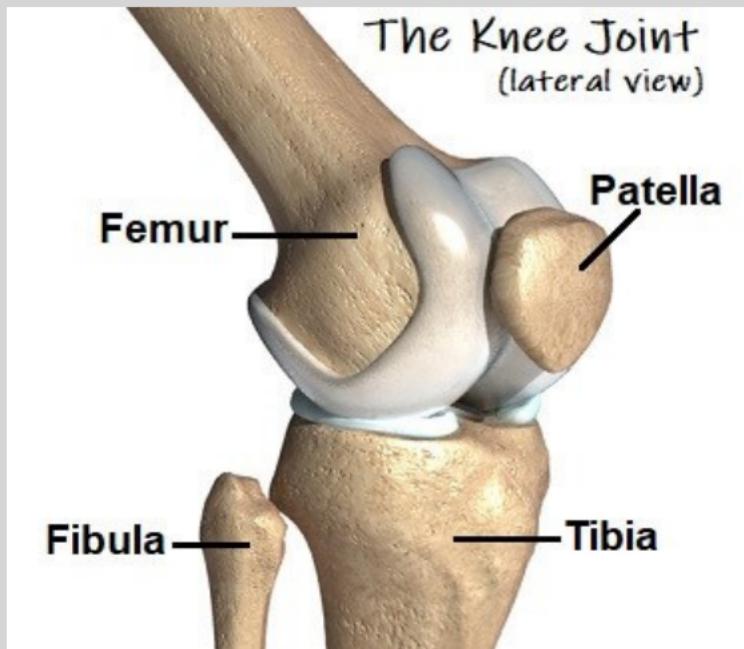
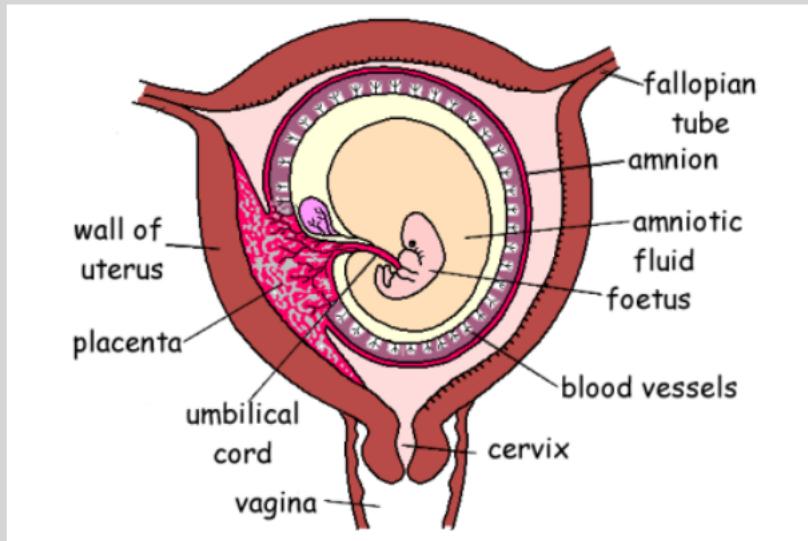


Comparing Plant and Animal Cells

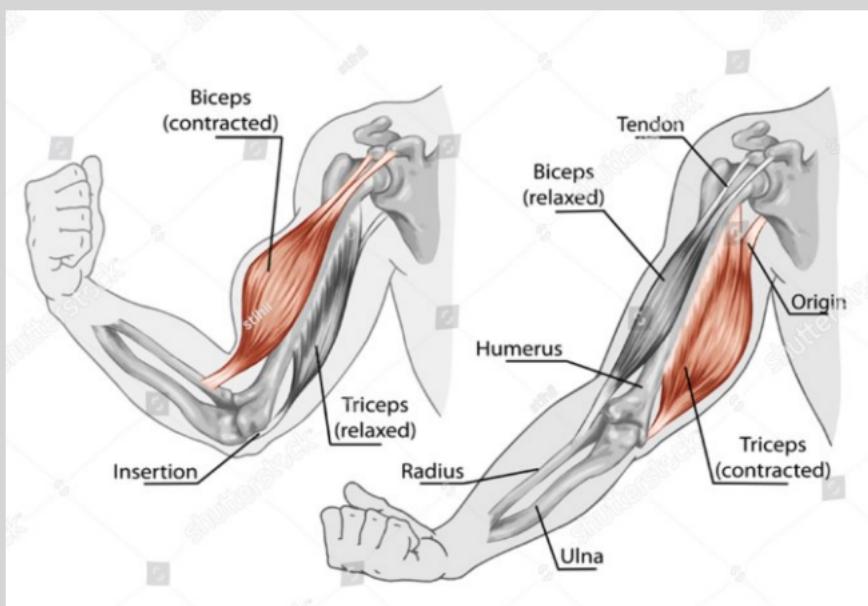
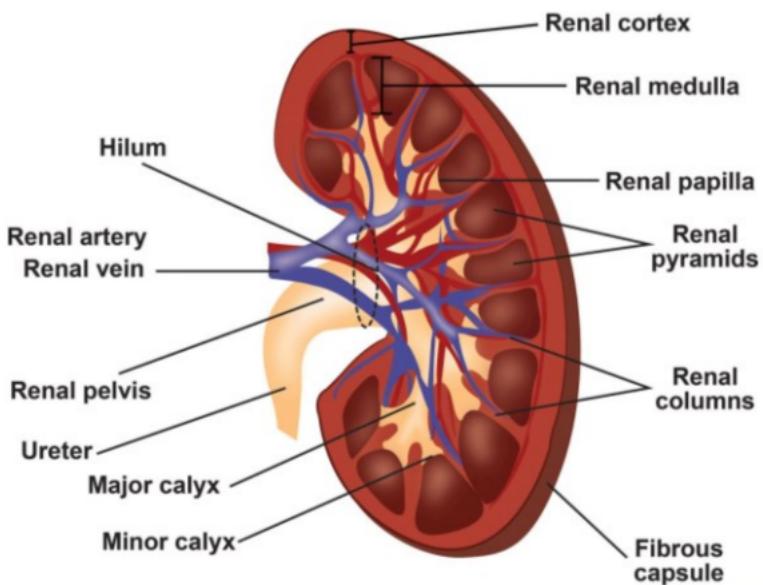
Part of a cell	Animal Cell	Plant Cell
Nucleus	✓	✓
Cell membrane	✓	✓
Cytoplasm	✓	✓
Cell wall		✓
Chloroplast		✓



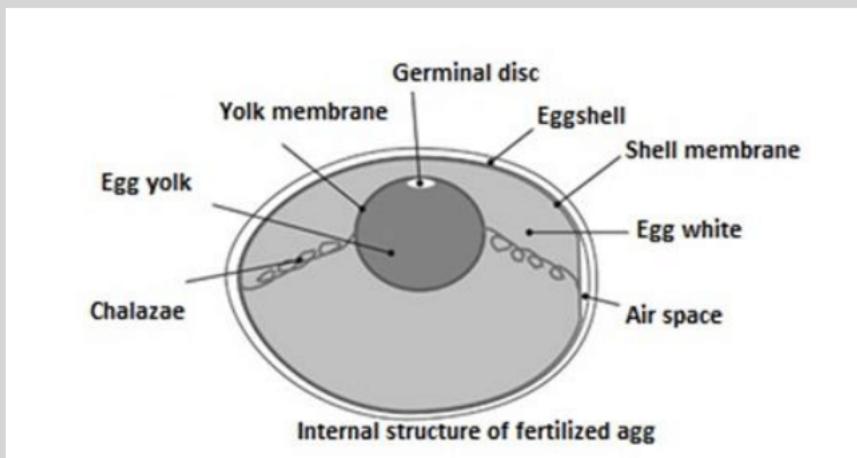
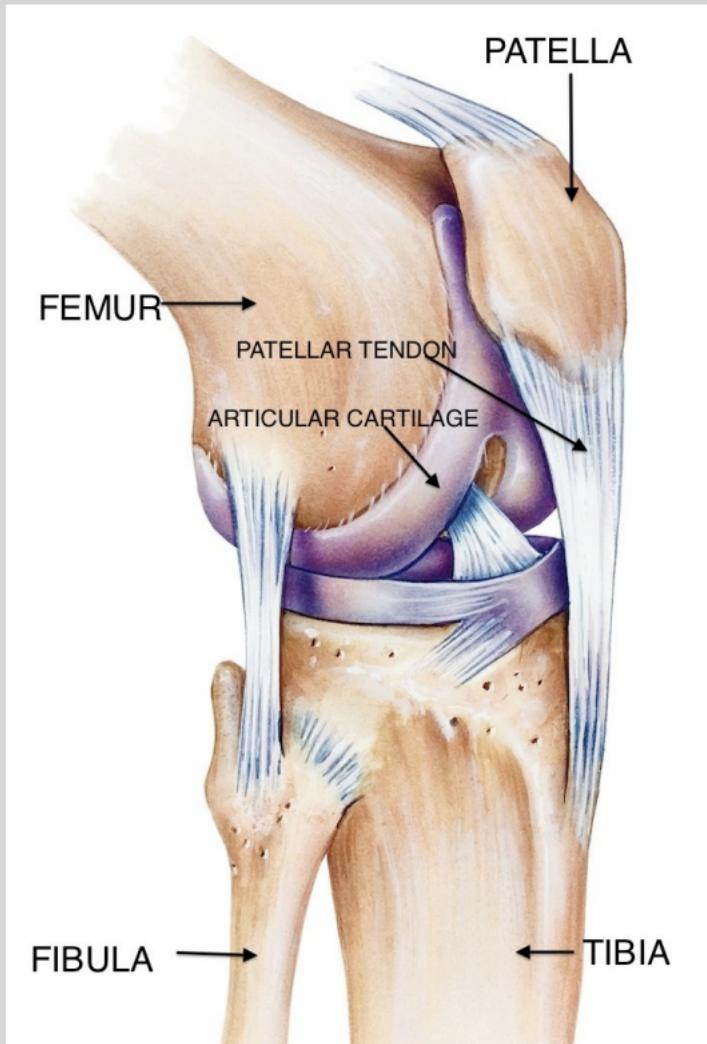




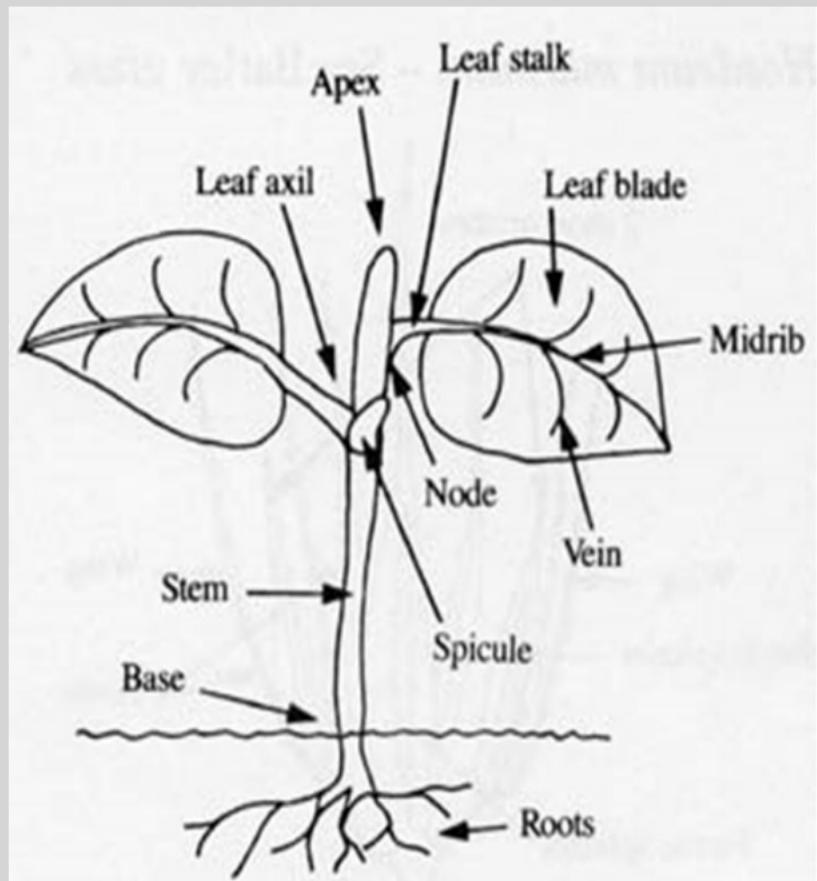
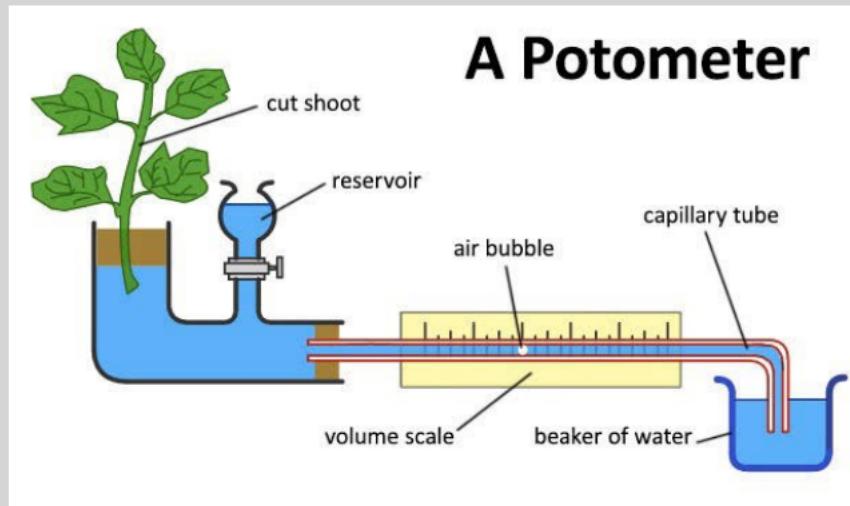
Kidney Anatomy

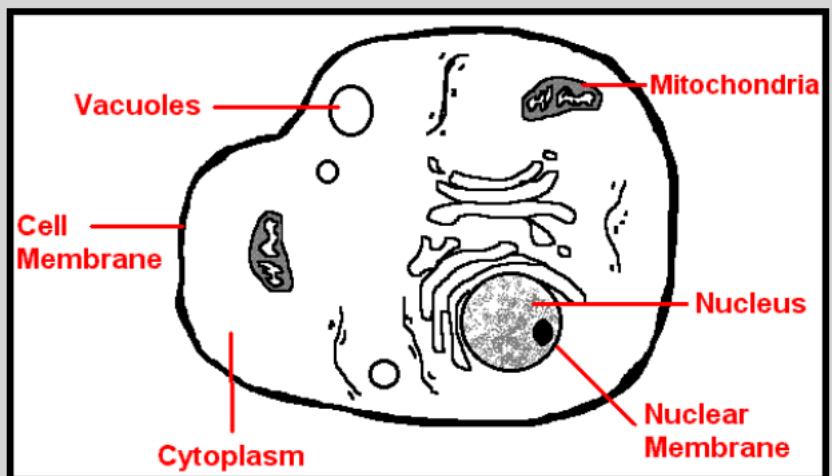
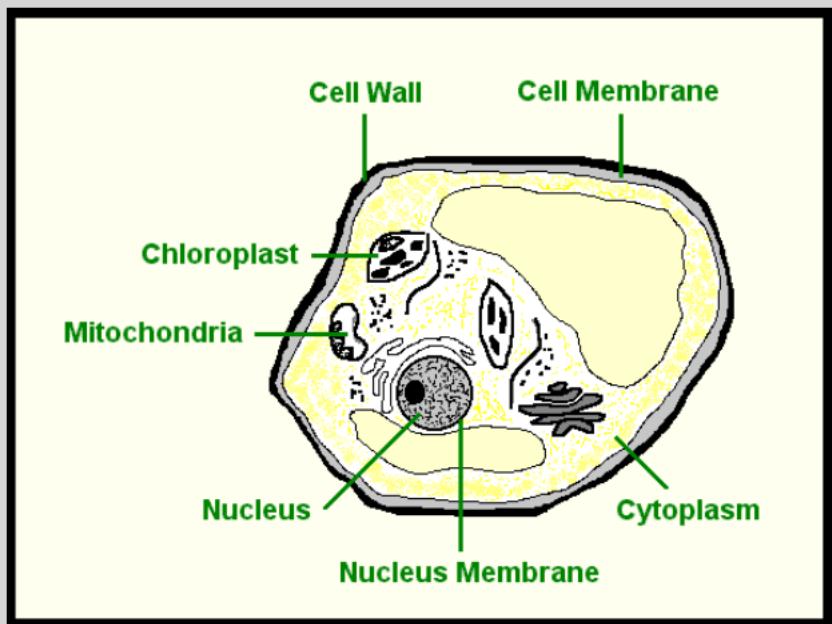
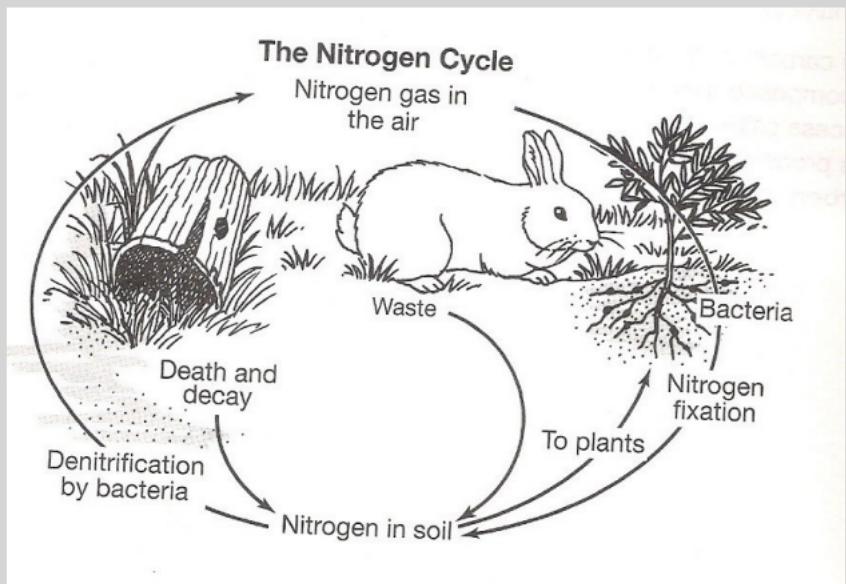


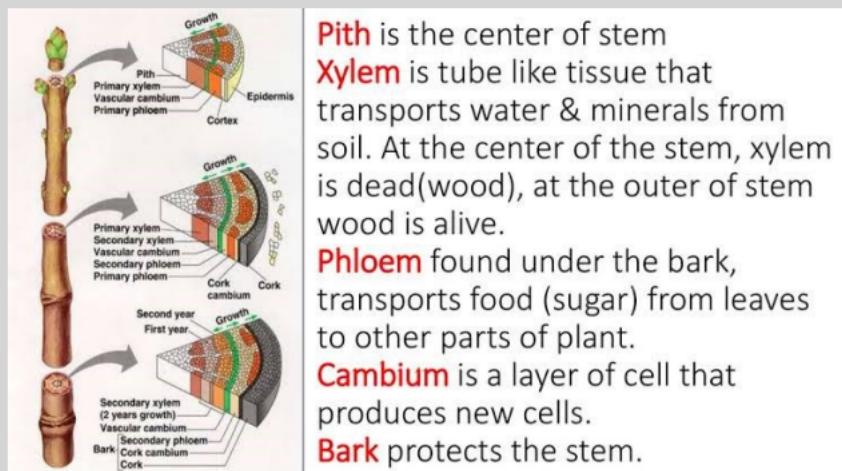
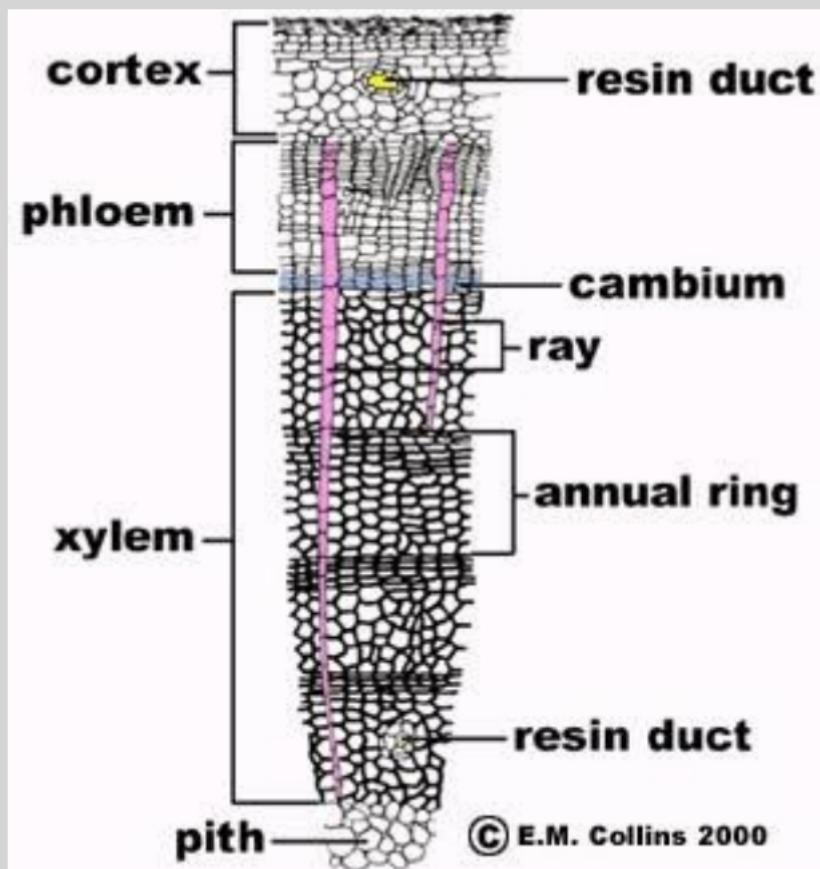
Vitamin/ Mineral	Deficiency disease/disorder	Symptoms
Vitamin A	Loss of vision	Poor vision, loss of vision in darkness (night), sometimes complete loss of vision
Vitamin B1	Beriberi	Weak muscles and very little energy to work
Vitamin C	Scurvy	Bleeding gums, wounds take longer time to heal
Vitamin D	Rickets	Bones become soft and bent
Calcium	Bone and tooth decay	Weak bones, tooth decay
Iodine	Goiter	Glands in the neck appear swollen, mental disability in children
Iron	Anaemia	Weakness



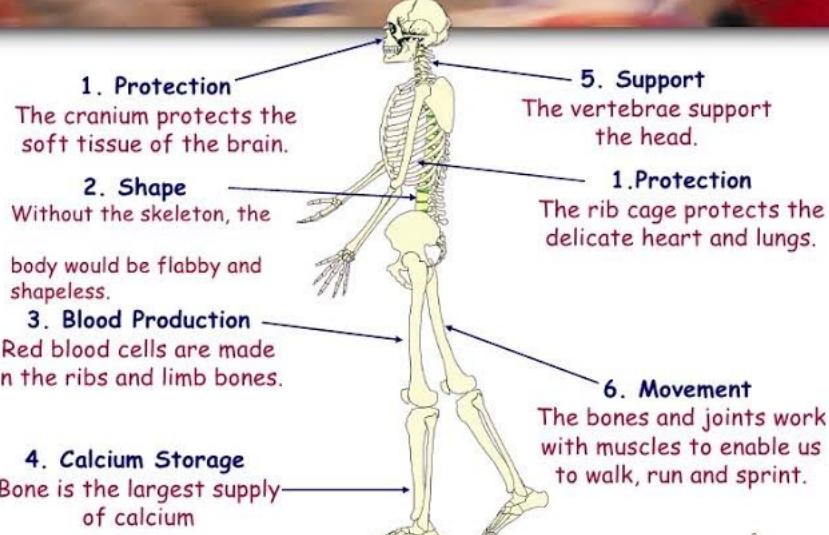
A Potometer

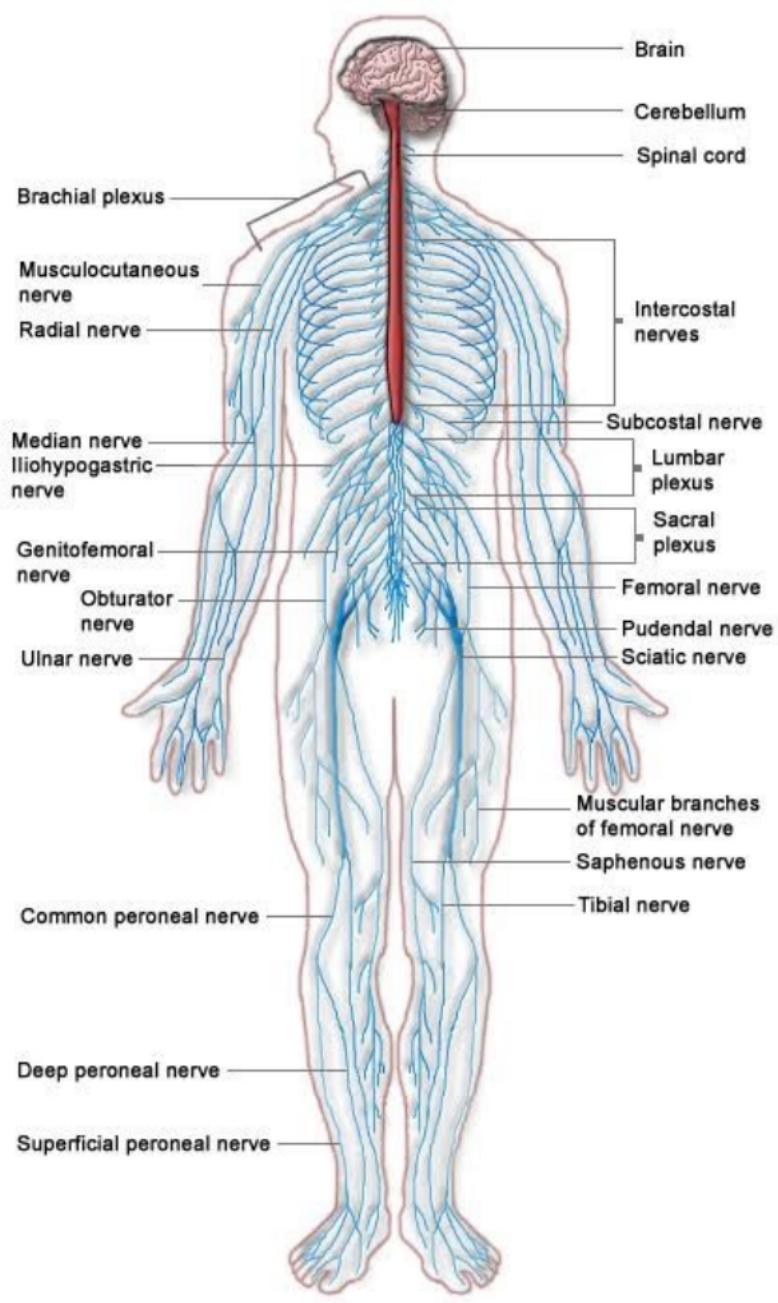


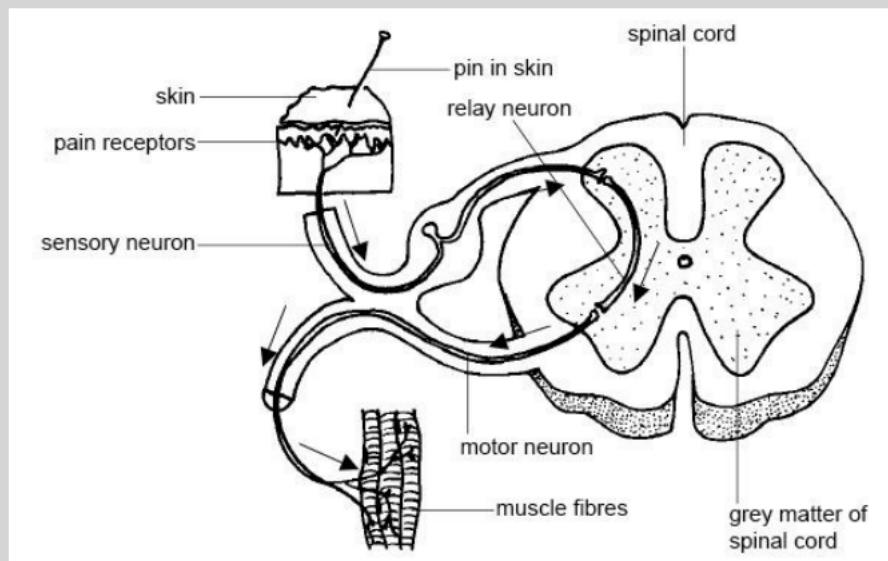
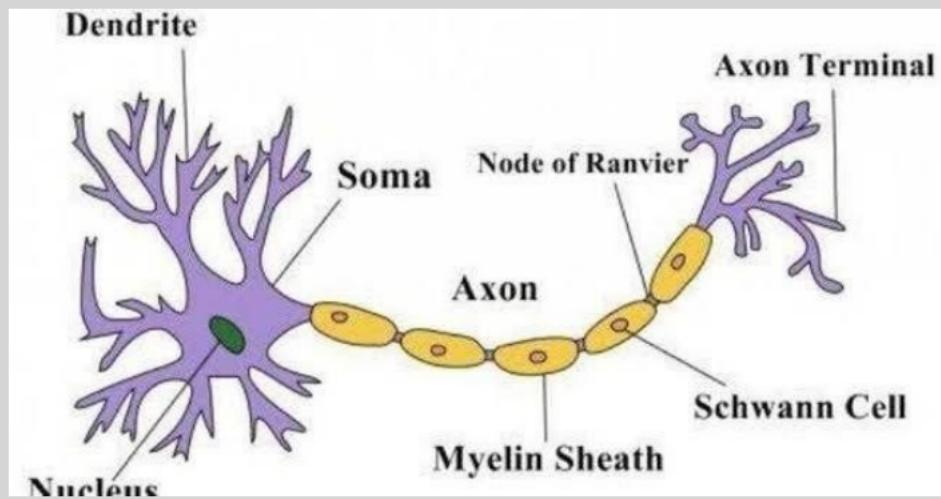




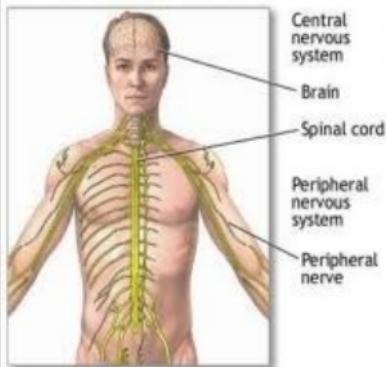
Functions of the Skeleton



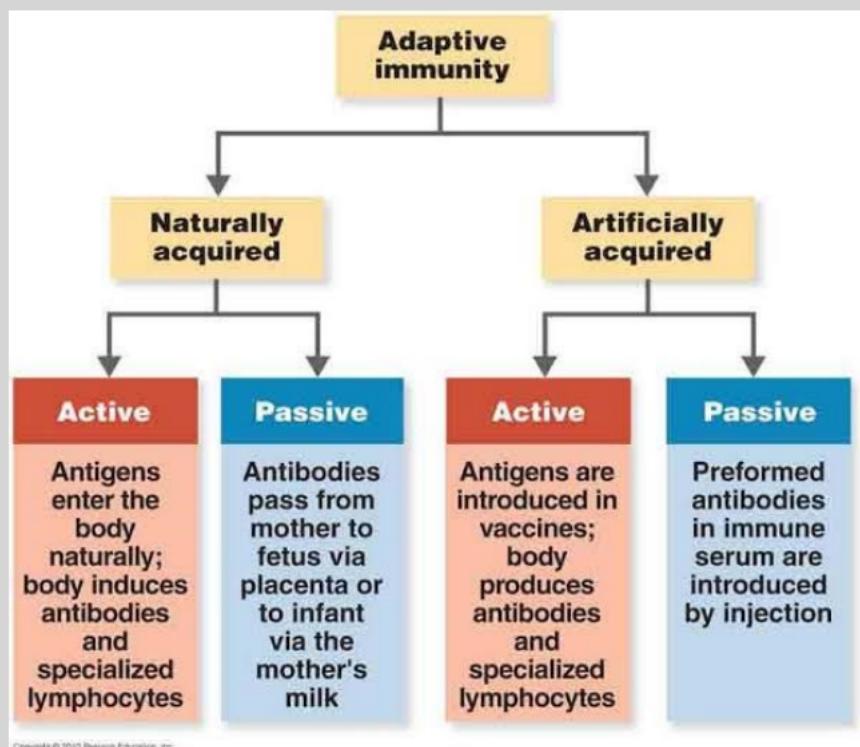




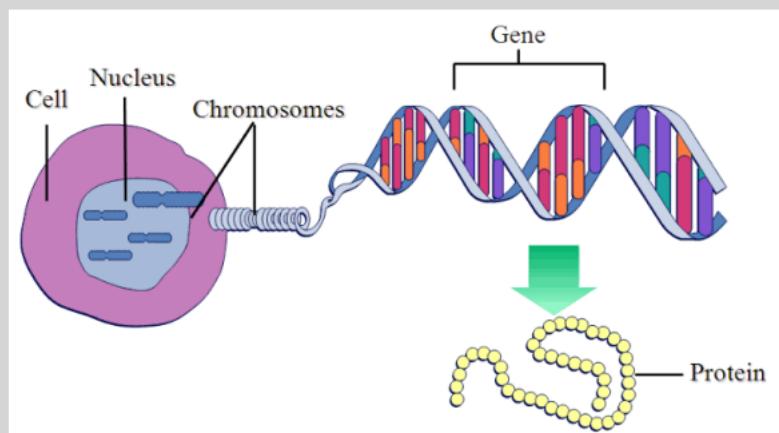
NERVOUS SYSTEM



- Controls all of your body's activities. None of your other systems would function without your nervous system.
- Receives information about your environment.
- Stores memories.
- Allows you to think.
- Organs: brain, spinal cord, nerves, sense organs

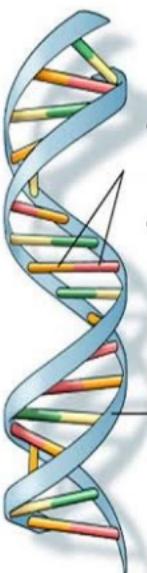


Role of white blood cells	How it protects you against disease
Ingesting microorganisms 	Some white blood cells ingest (take in) pathogens, destroying them and preventing them from causing disease.
Producing antibodies 	Some white blood cells produce special chemicals called antibodies. These target particular bacteria or viruses and destroy them. Each type of pathogen needs a unique antibody. Once your white blood cells have made the unique antibody they can make them very quickly next time the pathogen enters the body.



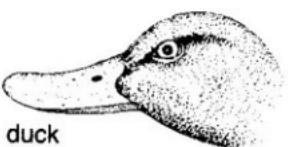
What is a Gene?

- A gene is the basic unit of heredity in a living organism
- Genes hold the information to build and maintain cells and pass genetic traits to offspring.



Key terms used in genetics and Inheritance

TERMINOLOGY	EXPLANATION
Variation	Observable differences (different characteristics) within a species that causes as a result of sexual reproduction
Continuous variation	Both inherited and environmental factors determine the characteristics of an individual. (eg: body mass, height)
Discontinuous variation	Inheritance of gene alone determines the characteristics of an individual.
Chromosome	Collection of genes that code for proteins necessary to control all the characteristics of an organism
Gene	Gene is a section of chromosome that code to make a particular protein which controls a specific characteristic of an organism. It is known as the unit of inheritance.
Gamete	Male or female sex cell (sperm or egg)
Alleles	A gene controlling character may sometimes have two or more alternative (different) form. Each form of a gene is called allele. (alternative form of a gene)
Dominant allele	The allele that dominate over a recessive allele. In the presence of at least a dominant allele always determines the phenotype of an organism (appearance/characteristic). Dominant allele is represented by capital letters (A, B, C etc.)
Recessive allele	The allele that cannot be expressed itself in the presence of a dominant allele unless two recessive alleles are present. The recessive allele is represented by simple letters (a, b, c, etc)
Genotype	The genetic make up of an individual (TT, Tt, tt)
Homozygous	An organism whose genotype for a particular character contains identical alleles (eg: TT, tt)
Heterozygous	An organism whose genotype for a particular character



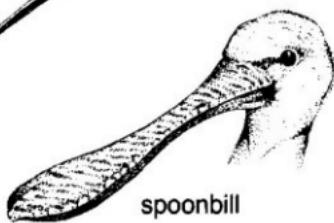
duck



heron



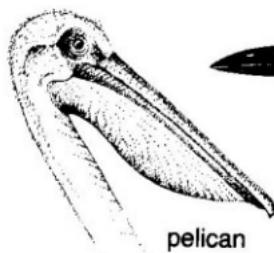
curlew



spoonbill



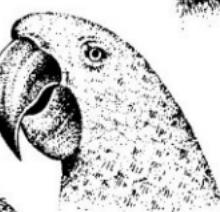
warbler



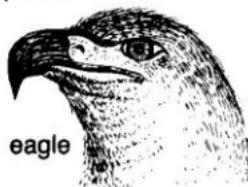
pelican



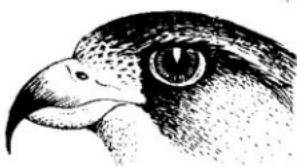
woodpecker



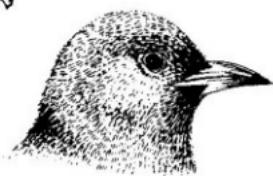
parrot



eagle



falcon



blackbird



sparrow

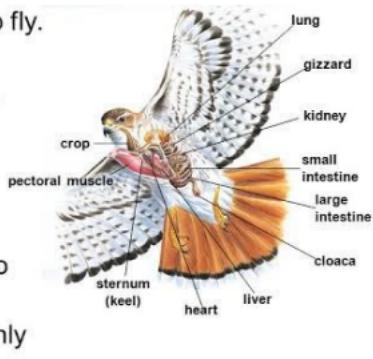


finch

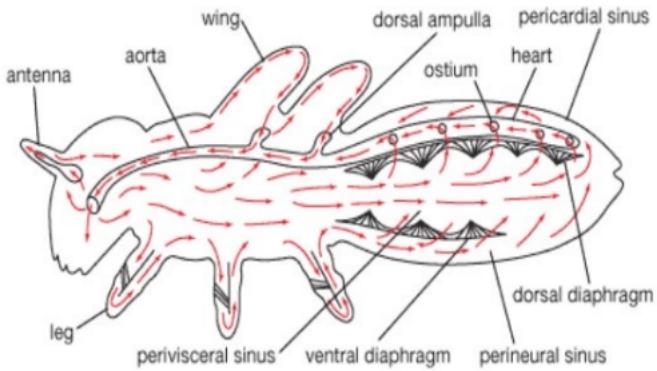
26.3 Birds

- A bird's body is specialized for flight.

- Birds have several unique features that allow them to fly.
 - wings to produce flight
 - strong flight muscles to move the wings
 - active metabolism that provides energy to the muscles
 - hollow bone structure to minimize weight
 - gonads active during only part of year

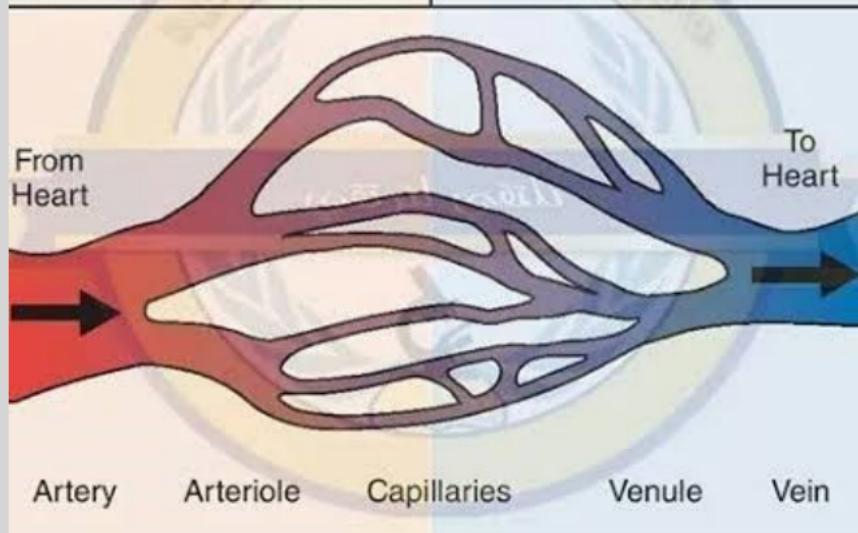


Heamolymph Flow in Insect



ARTERIES VERSUS VEINS

Arteries	Veins
1. Carry blood from the heart, carry oxygenated blood (except pulmonary artery)	1. Carry blood to the heart, carry deoxygenated blood (except pulmonary vein)
2. Normally bright red in color	2. Normally dark red in color
3. Elastic walls that expand with surge of blood	3. Thin walls/less elastic
4. No valves	4. Valves
5. Can feel a pulse	5. No pulse



READ BELOW

NEXT PAGE!

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pdfs etc**
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