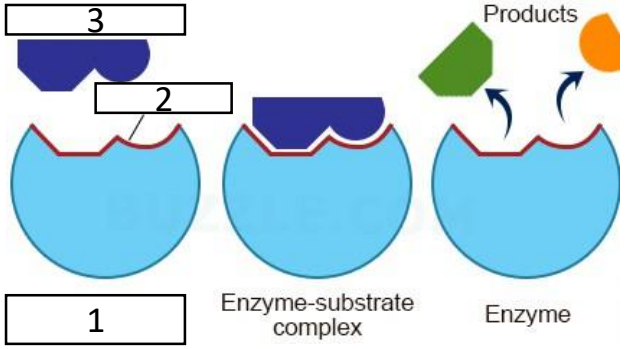
Biology Topic 2: Organisation

1. Principle of organisation

Level	Definition	Examples
Cell	Basic building blocks of all living organisms	Cheek Muscle
Tissue	Group of cells with a similar structure and function	Glandular Epithelial
Organ	A group of tissues performing specific functions	Stomach Pancreas
Organ system	A group of organs which work together to form organisms	Digestive system

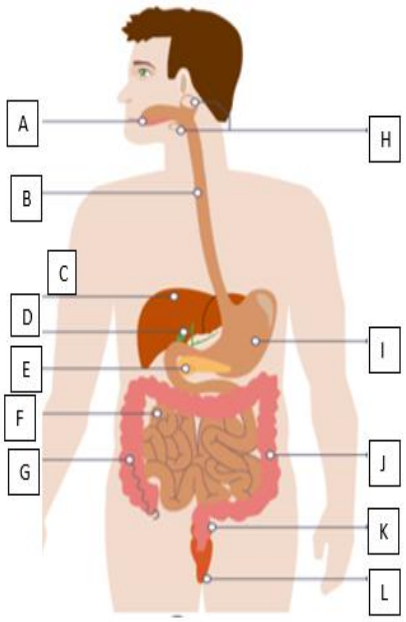
3. Enzymes

1	Enzyme	A biological catalyst. One type of enzyme does one specific reaction
2	Active site	The area of the enzyme with the specific shape to make the reaction happen with the substrate(s)
3	Substrate	The chemical(s) which are involved in the enzyme catalysed reaction



Denature	When an enzyme has its shape changed so it no longer works
Caused by:	• Temperature • pH

2. Digestive System

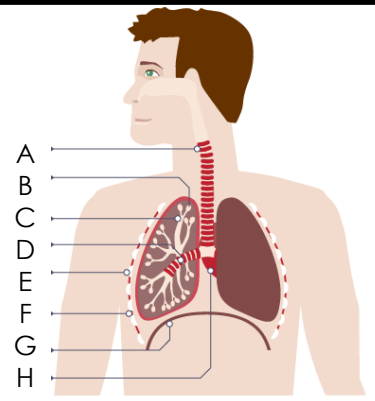


A	**Mouth**: mechanical breakdown/chew food	**G**	**Appendix**: useless organ which harbours bacteria (good and bad)
B	**Oesophagus** (gullet): push chewed food to stomach	**H**	**Salivary Glands**: produce saliva with amylase enzymes to breakdown starch
C	**Liver:** makes bile	**I**	**Stomach**: Partial digestion of food/mechanically churns food with HCl and protease enzymes
D	**Gall Bladder**: stores bile which breaks down fats (lipids) and neutralises the HCl(stomach acid)	**J**	**Large Intestine**: re-absorption of water
E	**Pancreas**: production of digestive enzymes	**K**	**Rectum**: muscular section of the large intestines
F	**Small Intestine:** absorption of small soluble particles	**L**	**Anus**: where faeces leaves the body

3. Types of enzyme

Name	Breaks down	Into	Produced in
Carbohydrase (eg amylase)	Carbohydrates (eg starch)	Simple sugars	Mouth Pancreas Small intestine
Protease	Protein	Amino acids	Stomach Pancreas Small intestine
Lipase	Fats (lipids)	Fatty acids and glycerol	Pancreas Small intestine

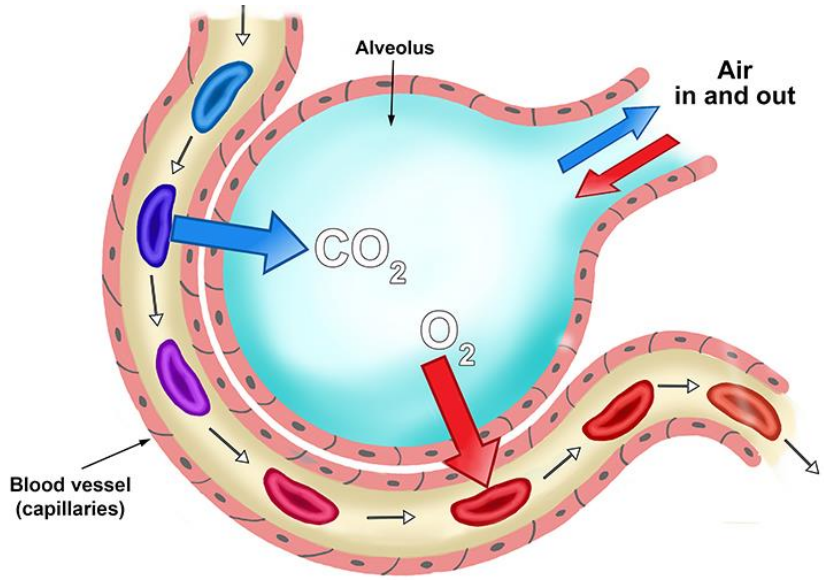
4. Respiratory system



A	Trachea
B	Alveoli
C	Bronchiole
D	Right bronchus
E	Ribs
F	Intercostal muscles
G	Diaphragm
H	Heart

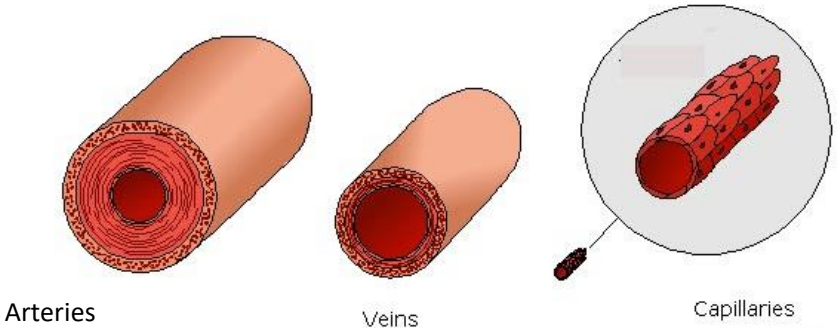
5. Adaptation to gas exchange: Alveoli

Thin walls	Capillary wall one cell thick
Moist layers	From mucus in alveoli
Large surface area	Many alveoli
High concentration gradient	Blood enters with low O_2 and high CO_2

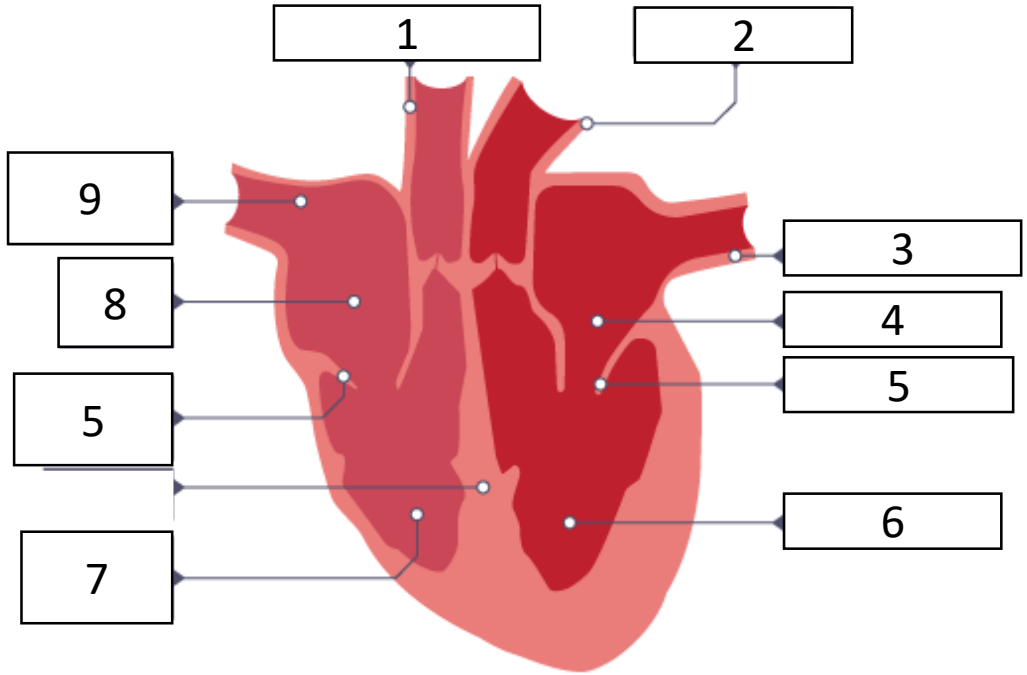


6. Blood vessels

Name	Lumen (hole) size	Walls	Muscles
Arteries	Small	Thick	Yes
Veins	Large	Thin	No
Capillaries	Very small	1 cell thin	No



7. The heart		
1	Pulmonary artery	Carries deoxygenated blood to the lungs
2	Aorta	Carries oxygenated blood to the body
3	Pulmonary vein	Brings oxygenated blood from the lungs
4	Left atrium	Pushes blood to left ventricle
5	Heart valve	Prevents backflow of blood
6	Left ventricle	Pumps blood to body
7	Right ventricle	Pumps blood to lungs
8	Right atrium	Pushes blood into right ventricle
9	Vena cava	Brings deoxygenated blood from body



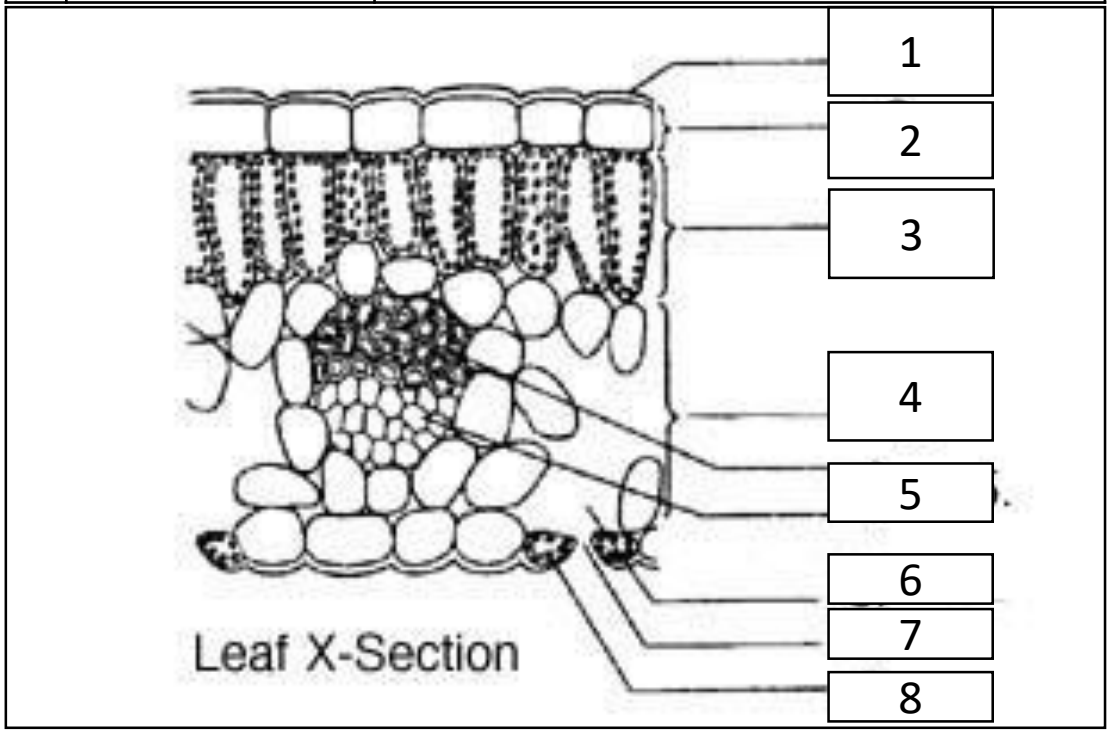
Remember – **VAVAVAVA** for the structure of the heart and path the the blood flows!

8. Blood	
Components	Function
Red blood cell	Carries oxygen
White blood cell	Fights infection
Platelets	Blood clotting
Plasma	Liquid that contain the other components and dissolved substances like urea

9. Coronary heart disease	
Coronary heart disease (CHD)	When fatty material builds up and stops the flow of blood to the heart muscle
Coronary arteries	The arteries that supply the heart muscle
Stent	A mesh tube used to keep the coronary arteries open
Statins	Drugs used to reduce blood cholesterol preventing (CHD)
Faulty valve	When the blood flows in the opposite direction through the heart. Will need replacing with biological or mechanical valve
Heart transplant	When a donor heart is used to replace a faulty heart
Artificial heart	Short term mechanical heart used while waiting for a transplant

10. Health issues	
Health	A state of physical and mental well-being
Disease	An abnormal condition that gives specific symptoms
Communicable disease	A disease which can be transferred
Non-communicable disease	A disease which can not be transferred
Lifestyle factors	Factors which can increase the chances of developing a non-communicable disease (eg smoking, diet, drugs, carcinogens)
Carcinogen	A substance which increases the risk of developing cancer
Cancer	A group of cells that divide uncontrollably
Benign tumour	A type of cancer contained within one area. It does not invade other parts of the body
Malignant tumour	A type of cancer which can invade other tissues and cause secondary tumours

11. Leaf structure and functions		
	Name	Function
1	Waxy cuticle	Protective layer
2	Epidermis	Prevents water loss
3	Palisade mesophyll	Contains a lot of chloroplasts. Site of photosynthesis
4	Spongy mesophyll	Full of air spaces to allow oxygen and carbon dioxide to diffuse
5	Vein	Contains xylem and phloem
6	Air space	Allows gases to pass through
7	Stomata	Hole for gases to move in and out of the leaf
8	Guard cells	Control the opening of stomata



12. Plant veins			
Name	Carries	Direction	Name of process
Xylem	Water and mineral ions	From roots to leaves	Transpiration
Phloem	Sugar ('food')	From leaves to roots	Translocation

13. Factors affecting transpiration		
Factor	Affect of increasing factor	Reason
Temperature	Increases transpiration	Water evaporates and diffuses faster
Humidity (amount of water in air)	Decreases transpiration	Less space in air around leaf for water to diffuse into
Air movement	Increases transpiration	Concentration gradient maintained
Sunlight	Increases transpiration	Stomata are open to let in CO_2 so more water escapes