

# IGCSE Biology Notes

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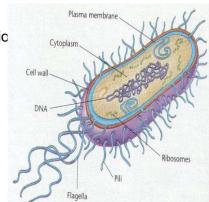
Unit 1 : Characteristics of living things

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- No chloroplast in most of them
- They are either saprophytes or parasites
- cell wall (not made of cellulose)

Bacteria reproduce asexually by binary fission every 20 min's (if condition conditions are not well some species can for spores for survival.



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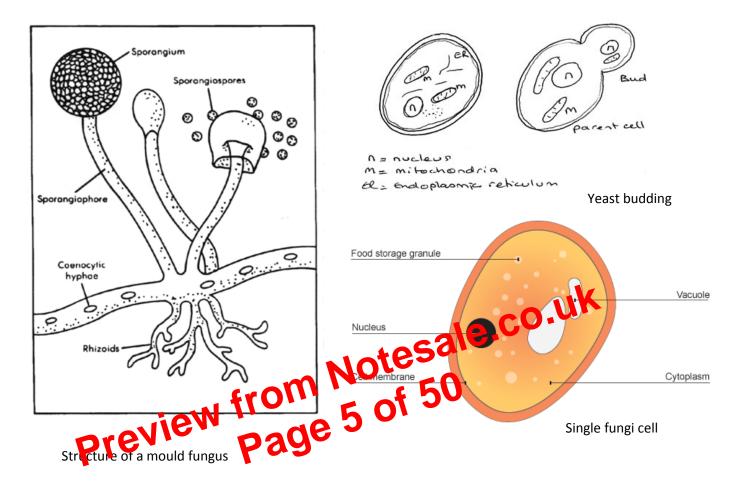
## **Fungi**

- Mostly multicellular (many cells) (yeast is an exception)
- Cell wall made of chitin
- IT has cytoplasm & it may be a saprophyte or a parasite





• It reproduces asexually by spore formation or by budding (in yeast) but in bad conditions it reproduces sexually for survival



Budding is when a yeast cell splits into two cells and it keeps happening over and over again numbers can get up to millions in just a day.

A mushroom is an example of a parasitic fungus.

### **Plants**





# Unit 4: Diffusion, active transport and osmosis

All the chemicals reacting in the cells need to get in and out either by a Passive process: This doesn't need energy e.g. osmosis and diffusion or an active process: one that requires energy e.g. active transport.

#### 1. Diffusion:

It is the movement of a molecule from a reign of high concentration to a reign of low concentration down the concentration gradient which is the difference in concentration of the substance, the greater the difference the higher the rate of diffusion.

The rate of diffusion depends on:

- Concentration gradient

2. Osmosis:

# • Permeability of membrane Osmosis: It is the management of the ma

It is the move its of water from a teign or high concentration (a dilute solution) of low consentration (a concentrated solution) down the concentration gradient through a semi permeable membrane. A hypertonic solution has higher concentration of salt; a hypotonic solution has a higher concentration of water and an isotonic solution as an equal concentration of water and salt.

#### 3. Active transport:

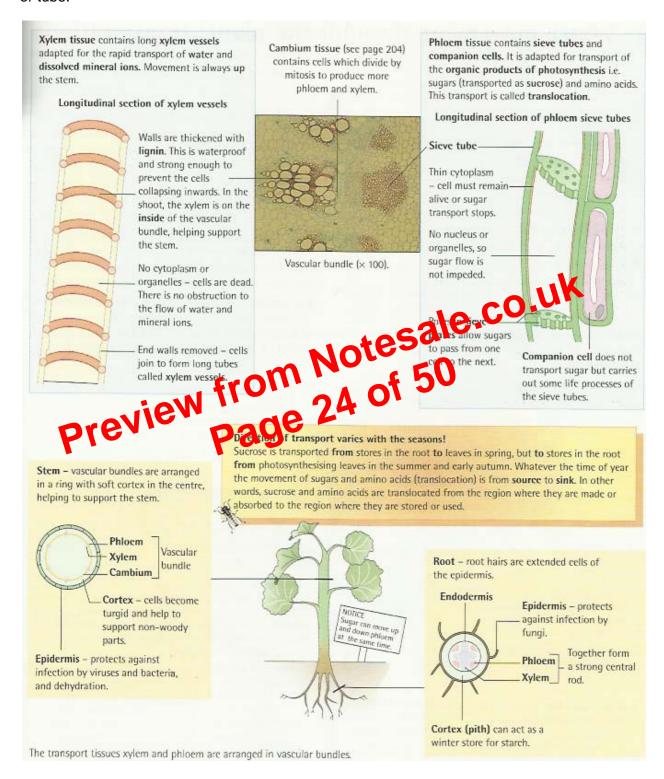
It is the uptake of substances from a reign of low concentration to a reign of high concentration, against the concentration gradient requiring protein carriers.

Diffusion	Osmosis	Active transport
Not selective	Not selective	Selective, cells absorb what they need
Substances move down a concentration gradient	Water move down concentration gradients	Substances move against concentration gradient.
Do not need energy	Doesn't need energy	Needs energy
A partially permeable membrane is not necessary	A partially permeable membrane is necessary (living or non living)	A partially permeable membrane is essential (must be living).





The xylem vessels themselves are very thin tubes, like capillary tubes. They have very hard and waterproof walls. The cells which made the xylem vessels died to produce a continuous column or tube.

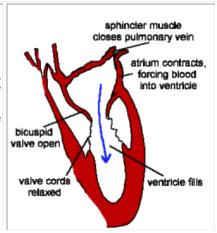






**ATRIAL** SYSTOLE

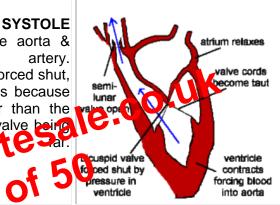
1) The atria contract, forcing blood into the ventricles, which fill. 2) Sphincter (ring) muscles closing off the venae cavae and the pulmonary veins prevents backflow from the atria into the main veins.



VENTRICULAR

1) The ventricles contract, forcing blood into the aorta & pulmonary

2) The main heart valves (tricuspid & bicuspid) are forced shut, so preventing backflow into the atria. This happens because the pressure of blood in the ventricles is higher than the pressure in the atria. The valve cords prevent the valve pairs pushed back



3) The walls of the aorta & pulmonary artery (MaQ).

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Phase	Atria	Ventricles	Cuspid valves	Semi-lunar valves
Diastole	Relaxed	Relaxed	Closed	Closed
Atrial systole	Contracting	Relaxed	Open	Closed
Ventricular systole	Relaxed	Contracting	Closed	Open

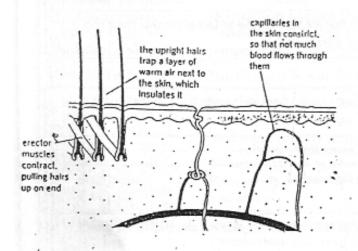
The heart rate can be measured by measuring the heart pace. There are muscles in the wall of the heart that receive hormones from the brain telling it to speed up or slow down e.g. adrenaline.

The vessel supplying the heart with blood is called the coronary artery. This is one of the most important arteries in the body because it supplies the heart with all the nutrients it needs. If this artery is blocked then the heart will slow down then stop causing a heart attack. This is how coronary heart diseases (CHD) happen by the buildup of fats on the inside of the vessel. The more fats build up the slower the heart is and the more the heart gets tiered and the person is unhealthy.

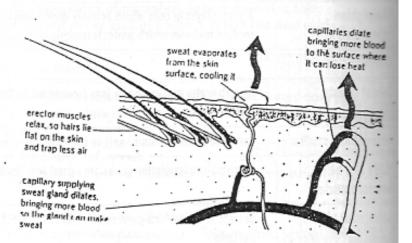


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e.gl: when gluchs	On a cold day	On a warm day		
1-Detection by skin receptor and hypothalamus in the brain	Message are immediately sent out in nerves to switch on the warming mechanism.	Messages are immediately sent out in nerves to switch on the cooling mechanism.		
2- Blood vessels (arterioles)	Vasoconstriction – arterioles become narrower so that less blood flows through the capillaries	dilate so that more blood		
3- Hairs	Hair erector muscles contract causing hairs to stand on. Thick trapped layer of air between the hairs. "thick insulater layer"	Hair erector muscles relax causing hairs to become flat. The layer of air trapped is very thin Heat is easily lost from the body Oy radiation and		
4- sweat glands	Less active so that later heat is not lost from the body 5	Very active more water is brough to the sweat glands during vasodilation, thus more sweat is secreted and more latent heat is lost when sweat evaporates		
5- Metaboolic rate	Increases More heat is produced. Shivering due to involuntary contraction of the muscles	Decreases Less heat produced		



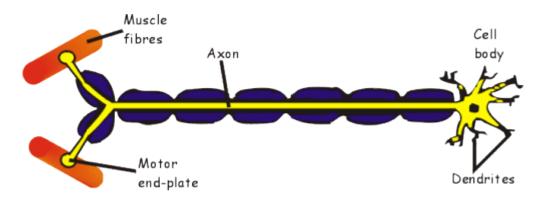




When the body is too hot



#### **Motor neuron**



These neurons carry impulses away from the CNS towards effecter organs like muscles or glands. These cells have very long axons at the end of which are motor end plates where the nerve cell can stimulate the effecter organ.

#### The reflex arc

A reflex action is usually quick passive action it is usually for protection. The spinal reflex does not need to pass through the brain but pass through a relay neuron. So a stimulus happens and a receptor (the sensory of the bases the impulse to the sensory neuron and then to the relay neuron and the triple motor mouron.

