The National Orthodox School Shmaisani

Subject: Science / Biology

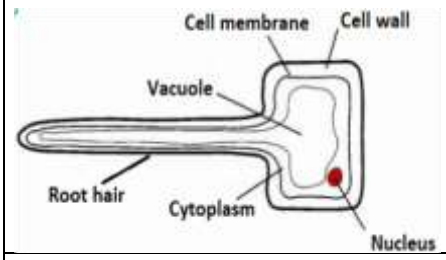
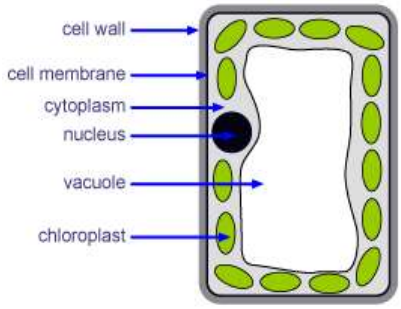
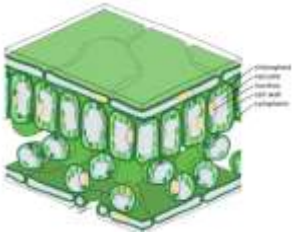
Name: **Study sheet (1): Specialized cells**

Date: **Grade-Section: 6 CS – all sections**

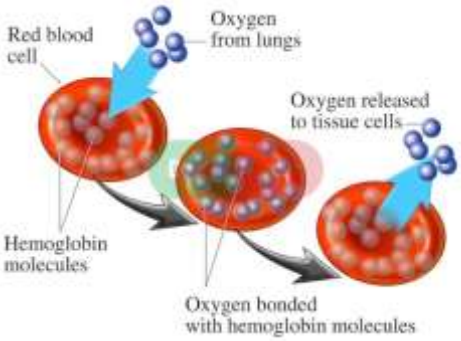
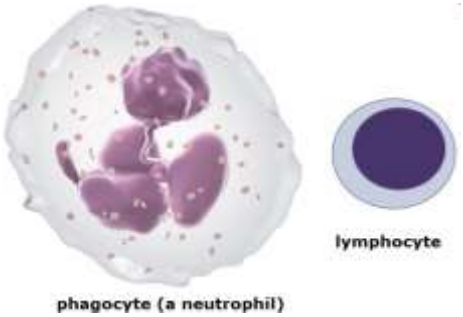
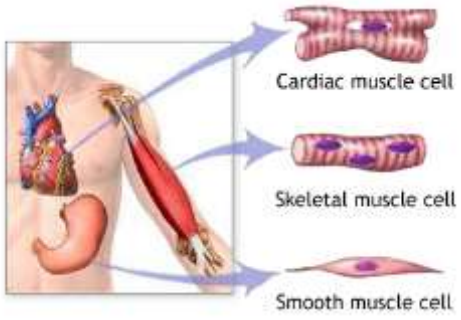
Objective: Relate the structure of cells to their functions.

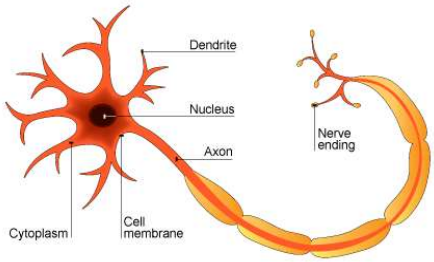
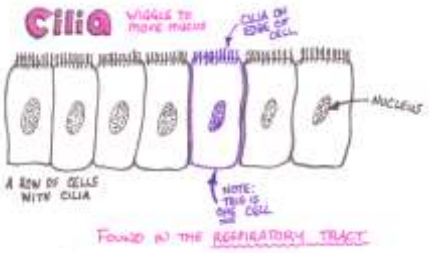
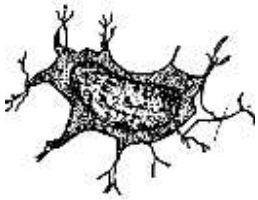
Cells with different functions have different structures. The cell is **adapted** to carry out its function really well.

- **<u>Some specialized plant cells</u>**

Cell	Function	Adaptation
1. Root hair cells 	**<u>They absorb water from the soil.</u>** The root hairs provide **a large surface area** for substances to enter the root.	The cells have **<u>long, thin extensions</u>** that allow them to grow easily between the soil particles.
2. Palisade cells (leaf cell) 	They have chloroplasts that contain chlorophyll to **trap** light **energy** for photosynthesis.	They have a shape that allows them **<u>to pack closely together</u>** in the upper part of a **leaf**. 

- **<u>Some specialized animal cells</u>**

Cell	Function	Adaptation
1. Red blood cells 	**<u>They carry oxygen around the body.</u>** Their cytoplasm contains a red substance called **haemoglobin**, which carries oxygen.	1. They are **<u>disc-shaped</u>** but their centers dip inward. 2. They don't have a nucleus (this makes more room for haemoglobin.)
2. White blood cells 	They are **cells** of the **immune system** that are involved in protection and fighting diseases.	**<u>Irregular shapes.</u>** for example: 1. **Lymphocyte**: produces antibodies, which attack harmful microorganisms in the blood. 2. **Phagocyte**: engulfs harmful microorganisms.
3. Muscle cells 	The function vary according to which organ it is found in.	**<u>These cells are long and thin.</u>** Each muscle cell is completely full of **fibers**. The fibers allow muscle cells to contract and produce movement.

Cell	Function	Adaptation
4. Nerve cells 	They transfer messages from one part of the body to another. **(Carry signals around the body.)**	Neurons have **long thread-like extensions,** so that they communicate with **distant** parts of the body.
5. Fat cells 	They act as an **energy store** for times when you can't eat enough. Helps to keep you warm.	The nucleus and cytoplasm are squeezed to the side to make room.
8. Ciliated cells 	The cilia move in a **wave-like motion** to carry the dust trapped in the mucus away from the lungs. They are found in structures like the nasal cavities, bronchial tubes and trachea.	**Cilia** are microscopic **hair like-extensions**. They need a lot of energy, so they always contain lots of **mitochondria**.
8. Bone cells 	Bone cells make fibers and excrete them into their surroundings	Produces fibers that attract minerals to make a rigid solid.