**Study sheet** **|** Lower Secondary

Stage (6-8)

1st Semester | 2023-2024

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| **Subject:** Biology | **Chapter: Specialized Cells** |
| **Name:**  **Objectives: 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.   * **Some specialized plant cells**  |  |  |  | | --- | --- | --- | | **Cell** | **Function** | **Adaptation** | | 1. Image result for root hair cells diagram black and white **Root hair cells** | **They absorb water from the soil.**  The root hairs provide **a large surface area** for substances to enter the root. | The cells have **long, thin extensions** that allow them to grow easily between the soil particles. | | 1. **Palisade cells (leaf cell)** | They have chloroplasts that contain chlorophyll to **trap** light **energy** for photosynthesis. | They have a shape that allows them **to pack closely together** in the upper part of a **leaf**. |  * **Some specialized animal cells**  |  |  |  | | --- | --- | --- | | **Cell** | **Function** | **Adaptation** | | 1. **Related imageRed blood cells** | **They carry oxygen around the body.**  Their cytoplasm contains a red substance called **hemoglobin**, which carries oxygen. | 1. They are **disc-shaped** but their centers dip inward.  2. They don’t have a nucleus (this makes more room for hemoglobin.) | | 1. **White blood cells** | They are **cells** of the **immune system** that are involved in protection and fighting diseases. | **Irregular shapes.**  for example:  1. **Lymphocyte**: produces antibodies, which attack harmful microorganisms in the blood.  2. **Phagocyte**: engulfs harmful microorganisms. | | 1. **Muscle cells**   **Image result for cardiac smooth skeletal muscles** | The function varies according to which organ it is found in. | **These cells are long and thin.**  Each muscle cell is completely full of **fibers**. The fibers allow muscle cells to contract and produce movement. | | |
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| **Cell** | **Function** | **Adaptation** |
| 1. **Image result for nerve cell adaptationsNerve 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. |
| 1. **Fat cells**   ÙØªÙØ¬Ø© Ø¨Ø­Ø« Ø§ÙØµÙØ± Ø¹Ù âªfat cells diagramâ¬â | 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. |
| 1. **Ciliated cells**   Related image | 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. |