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| **Question** | **NOTES** |
|  | **Chapter 9 – Section 2: “Looking Inside Cells – Part 1” Classwork and Study Notes**  **Enter the Cell**   1. As we have studied, cells are in all living organisms. They are very tiny. There are even smaller structures inside a cell and these are called **organelles. Organelles** carryout specific functions within a cell just each organ in your body and those of animals carryout a specific function.      1. **Cell Wall** – To first enter a cell, you must go through the **cell wall** which is a rigid layer of nonliving material that surrounds the cells of plants and some other organisms. The cells of animals do not have a **cell wall.** A plant’s **cell wall** is mostly made of **cellulose** which protects and supports the cell. Although the **cell wall** prevents a number of materials from entering the cell, it does allow water and oxygen to easily pass through. 2. Once you pass through the **cell wall,** you next encounter the **cell membrane.** All cells have membranes and the **cell membrane** controls what substances come into and out of a cell. Food, oxygen and other necessary materials pass into the cell by way of the **cell membrane** and waste products pass out through the **cell membrane**. The **cell membrane** helps to keep harmful substances from entering the cell. 3. What is the function of the **cell membrane?** Write your answer here 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **The Nucleus**   1. The **nucleus (see the picture below)** is located inside the cell and is essentially the brain of the cell. It directs all of the activities of the cell and consists of 3 main parts. They are: 2. The **nuclear envelope, and** 3. The **chromatin, and** 4. The **nucleolus**      1. **Nuclear Envelope 🡪** Notice that the **nucleus** is surrounded by the **nuclear envelope** which protects the nucleus. Materials pass in and out of the nucleus through pores in the nuclear envelope. 2. **Chromatin 🡪** The thin strands of material in the **nucleus** are called the **chromatin**, which contain genetic material or the instructions for directing the cell’s functions. 3. **Nucleolus 🡪** The nucleolus is where **ribosomes** are made in the **nucleus. Ribosomes** are the organelles where proteins are produced and these proteins are important chemicals in the cells.   **Organelles in the Cytoplasm**   1. A substance called **cytoplasm** surrounds the nucleus. It is a gel-like fluid and is constantly moving. Many cell organelles are located in the **cytoplasm.** Some of these cell organelles are:      * 1. **Mitochondria 🡪** These structures are rod-shaped and are known as the “powerhouses” of thee cell because they convert energy in food molecules to energy that the cell can use to carry out its functions.      * 1. **Endoplasmic Reticulum 🡪** Further inside the cell is the **endoplasmic reticulum** which is a series of passageways that carry proteins and other materials from one part of the cell to another.   2. **Ribosomes 🡪** Attached to the endoplasmic reticulum are small, grain-like bodies called **ribosomes.** Other **ribosomes** float in the **cytoplasm. Ribosomes,** as noted above, function as factories to produce proteins. Some of the newly made proteins are released through the wall of the endoplasmic reticulum where they are transported to the **Golgi bodies.**   3. **Golgi Bodies 🡪** The **Golgi Bodies** can be thought of as the cell’s mail room. The **Golgi Bodies** receive proteins and other newly formed materials from the **endoplasmic reticulum** and then package them and distribute them to other parts of the cell.   4. **Chloroplasts 🡪** Plants and some other organisms have a green organelle called **chloroplasts.** These green structures capture energy from sunlight and use it to produce food for the cell. It is the **chloroplasts** that make leaves green.   5. **Vacuoles 🡪** Thee **vacuole** is a large water-filled sac that floats in the **cytoplasm. Vacuoles** are the storage areas of cells. They store food and other materials needed by the cell. Most plant cells have 1 large **vacuole** and some animal cells do not have **vacuoles** but others do. **Vacuoles** can also store waste products.   6. **Lysosomes 🡪 Lysosomes** are small, round structures containing chemicals that break down certain materials in the cell. **Lysosomes** also break down old cell parts and release the substances so they can be used again. The **lysosomes** of the cell function like a cleanup crew.   **Specialized Cells and Tissue**   1. Plants, animals and mammals (including ourselves) contain many **specialized cells**. **Specialized cells** are often organized into tissues, organs and organ systems. Examples of **specialized cells** are nerve cells, red blood cells, liver cells and so on. A group of similar **specialized cells** are called **tissue.**     **Mitochondria Golgi Body Nerve Cell** |
| **Summary:** |  |