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| **Question** | **NOTES** |
|  | **Chapter 10 – Section 2: “Respiration” Classwork and Study Notes**  **What is Respiration?**   1. After you eat a meal, what happens to the food as it enters your body? First it passes through your digestive system where the food is broken down into small molecules. These small molecules then pass out of the digestive system and go into your bloodstream. Next they travel through the bloodstream to the various cells of your body. Once they arrive at the designated cells in your body, they go through the cell to the inside and release their energy so that the cell can perform its required functions. 2. The process that cells use to obtain energy from glucose is called **respiration.** During **respiration**, cells break down simple food molecules such as (glucose) sugar and release the energy they contain. Both animals and plants need a constant supply of energy, therefore they **respire** continuously. 3. Energy stored in cells is like having money in a savings account at the bank. You only withdraw from the bank the money that you need at the time. Similarly the energy in the cell is stored there as carbohydrates (sugars and starches) until it is needed by the cell and then it is released. 4. The term **respiration** has 2 meanings. One meaning refers to the breathing of air in and out of our body. The second meaning refers to the storage and release of the food energy molecules within cells and is oftentimes referred to as **cellular respiration.** 5. There are 2 stages of **cellular respiration** and they are as follows:      1. The 1st stage takes place in the cytoplasm of the organism’s cells where molecules of glucose are broken down in smaller molecules and a small amount of energy is released. The 2nd stage takes place in the **mitochondria** where the small molecules are broken down into even smaller molecules. These chemical reactions require O2 and they release a great deal of energy which is why the **mitochondria** are called the “powerhouses” or “power plants” of the cell.      1. The equation that covers the **cellular respiration** process is as follows:   **C6H12O6 + 6O2 6C02  + 6H2O + Energy**  (a sugar) (oxygen) (carbon dioxide) (water)   1. Notice that the **raw materials** for **respiration** are sugar and oxygen. The sugar (glucose) in the cells of animals and other organisms comes from the food they consume. The oxygen used in **cellular respiration** comes from the air or water surrounding the organism. 2. The second reaction product is oxygen (O2) which exits the leaf through the **stomata**. Without this reaction and its release of oxygen we would not have enough O2 in the atmosphere to breathe.   **Comparing Photosynthesis and Cellular Respiration**   1. You can think of **photosynthesis and cellular respiration** as opposite processes as shown in the following diagram:      1. Look closely at the 2 equations in the diagram above. What do you notice about the left and right hand sides of each equation? Write your observation here 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. Together these 2 processes form a cycle as noted by the 2 arrows in the above diagram. The arrows denote the direction of the flow of the **raw materials** and **products** of each process. 2. From the information above, answer the following questions in the space provided below:    1. List the **raw materials** and **products** of each of the above 2 processes below.   **Process** **Raw Materials Products**  **Photosynthesis** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Respiration** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_     1. What is the process called that releases energy from food? Write your answer here 🡪 \_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. Why is respiration important to cells? Write your answer here 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. What is the importance of the mitochondria? Write your answer here 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Fermentation**   1. Some organisms obtain their energy from food without using oxygen. Some organisms that live in the deep zone of the open ocean obtain their energy through **fermentation** and energy-releasing process that does not need oxygen. **Fermentation** provides energy for cells with using oxygen. 2. **Alcoholic fermentation** occurs when yeast and some other single-celled organisms break down sugars and one of the products of the process is **alcohol**. The other products are CO2 and a small amount of energy. 3. **Lactic acid fermentation** occurs when you exercise your muscles in a very rapid manner such as occurs to track sprinters. Have you ever noticed the grimace on the face of runners who are running fast? They are feeling a painful sensation in their muscles due to the formation of **lactic acid** in their muscles. **Lactic acid** forms because the muscles use the available oxygen faster than it can be produced and **lactic acid fermentation** in the muscles has occurred. |
| **Summary:** |  |