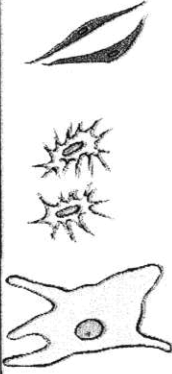


What's in Your Cells?

Cross-Curricular Focus: Life Sciences



Living things eat, grow, get rid of waste products, and reproduce. If you could look at the tiniest unit in any living thing, you would find a **cell**, because all living things are made of cells. Cells have special structures called **organelles** that help them do the work of moving materials around, dividing to make more cells, and making proteins for the body's needs. Cells get energy through a process called **cellular respiration**. During cellular respiration, cells convert sugar (called glucose) and oxygen into carbon dioxide (the gas we breathe out) and water. This whole process releases energy for the cell to use. The energy is stored as ATP. ATP is like "back up power" in storage that can be taken out to be used as needed. That way, the cell always has the energy it needs to take care of business.

Living things can have just one cell, or many. Single-celled organisms include things like bacteria, yeast, and algae. They do all the things that living things do, within just one cell. Multi-cellular organisms have literally billions of cells that work together to provide for the organism's needs.

Plant and animal cells both have structures called **organelles**. Many of the same organelles are found in both types of cells, but some of the organelles are unique to plants or animals. All cells have a control center called a nucleus. The nucleus stores a special molecule called DNA. The organism's traits, or characteristics, are controlled by the coding found in its DNA. All cells have a cell membrane, or covering, that surrounds the cell to protect it and control what goes in or out of the cell. Materials can move by **diffusion**, a process that contains materials in a gas or liquid, or **osmosis**, a special kind of diffusion that allows water to pass through the membrane, but keeps out many other materials. Plant cells have an extra layer called a cell wall that surrounds each cell's membrane. The cell wall is much stiffer to help the plant's stems stand up and support things like leaves and flowers. **Cytoplasm** is a thick fluid, kind of like jell-o, that fills the space between a cell's nucleus and its cell membrane. Floating in, and supported by, the cytoplasm are the organelles, such as ribosomes, which make proteins; lysosomes (found mostly in animal cells), which break apart nutrients; the Golgi apparatus ("goal-gee app-ah-at-us"), which packages up proteins to get them ready to be sent to various parts of the body; vacuoles, which are like bags of fluid that cells use to store things until they are needed, or until they can be disposed of; mitochondria, which generate energy for the cell; the endoplasmic reticulum (ER), which is a system of tubes and passages for transporting materials, and chloroplasts (in plants only) which allow food to be made using sunlight and carbon dioxide. All the organelles work together to make sure that the cells, and ultimately, the living organism can do all the things that are necessary for survival.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) Contrast a plant cell with an animal cell. How can you tell them apart? _____

2) What is the purpose of this reading passage? _____

3) Predict what might happen if a cell lost its ability to perform cellular respiration. _____

4) Cytoplasm has been compared to jell-o. How does this comparison help you understand what it is? _____

5) What structure in plants allows them to perform photosynthesis? _____