Name _____ Date _____

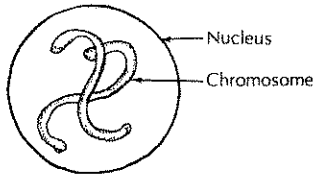
2–4. THE ANATOMY OF THE CELL

Instructions: (1.) Read the text. (2.) Complete the project. (3.) Use the text and the project to help you to answer the questions.

Every cell in your body has at least one special job to do. A few examples: The cells in the outer layers of your skin are designed to protect you from your external environment, certain cells in your stomach make chemical substances to digest the food you eat, and other cells are specially designed to carry electrochemical impulses that make your muscles contract.

Even though your body cells have different jobs to do, certain aspects of their internal anatomies (structures) are similar. While doing this project, you will learn the internal anatomy of a generalized cell.

The job of the nucleus is to be the control center of the cell. The nucleus of each human cell contains 46 chromosomes, which store instructions for the cell's activities. The nucleus is the most obvious structure in the generalized cell. The following diagram shows what the nucleus and the chromosomes look like. For simplicity, the diagram contains only two chromosomes.



☐ 1. Color the nucleus brown.

☐ 2. Color the chromosomes blue.

One of the ways in which the nucleus directs the cell's activities is by sending instructions to the ribosomes, where proteins are assembled. The following diagram shows what a ribosome looks like.

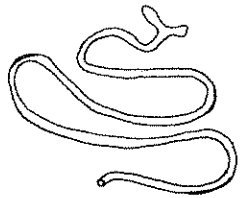
☐ 3. Color this ribosome green.

Ribosomes receive instructions from the chromosomes by molecules called "messenger RNA." A round structure found within the nucleus assists in the production and storage of RNA. This structure is called the "nucleolus." The diagram below shows the nucleolus; dashed lines are used to represent molecules of RNA.

☐ 4. Color this nucleolus yellow.

☐ 5. Color the RNA molecules pink.

Once proteins are made, they are sometimes transported through the cells by a system of tubes called the "endoplasmic reticulum." The following diagram shows what the endoplasmic reticulum looks like.



☐ 6. Color this endoplasmic reticulum blue.

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The endoplasmic reticulum delivers many types of proteins to the Golgi body. The function of the Golgi body is to coat protein with a molecular layer that allows the protein to leave the cell. The diagram below shows what the Golgi body looks like.

☐ 7. Color this Golgi body yellow.

Lysosomes contain chemical substances called "enzymes." Lysosomes use these enzymes to break certain nutrients called "proteins" into their building blocks, the amino acids. As a nutrient enters the cell, it attaches to a lysosome. The amino acids that result from that breakdown are used by the ribosomes to make new proteins. The following diagram shows what a lysosome looks like.

☐ 8. Color this lysosome red.

Vacuoles are storage sacs where incoming nutrients are stored before they are broken down by lysosomes. The following diagram shows what a vacuole looks like.

☐ 9. Color this vacuole any color.

To assemble proteins and to perform other functions, the cell uses energy. The mitochondria act like power houses; that is, they produce energy in a form that the cell can use. The following diagram shows what mitochondria look like.

☐ 10. Color this mitochondrion orange.

To complete this project, use what you have learned to label the diagram at the end of this activity.

Level One Questions:

1. The _____ is the fundamental building block of the body.
2. How are certain cells in your stomach specialized?

   _____

   _____

   _____
3. The _____ is the control center of the cell.
4. How many chromosomes are in each human cell? _____