

RHC - The Basic Unit of Life

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Name: _____

Science 9

1. Directions: Read the following text and highlight what a cell is in one color and the two types of cells in another color.

After many hours spent looking through microscopes, scientists have determined that even though there is no one, common cell, all plant and animal cells have many common factors. A **cell** is the functioning basic unit of life and is the smallest unit of life that is classified as a living thing. It was discovered by Robert Hooke in 1665 and is considered to be the building block of life.

Some organisms (such as bacteria) are unicellular where they consist of a single cell. Other organisms such as humans are multicellular where they consist of many cells. For example a human would have about 100 trillion cells.

2. Directions: Read the following text and highlight the parts of the cell in one color, and in another color highlight the description (definition) of what each part does.

Many of the cell structures can be seen with a light microscope. You should be able to see the nucleus and possibly some of these other structures using a microscope.

The entire cell is covered by a flexible envelope called a **cell membrane**. The membrane acts like a gatekeeper, controlling the movement of materials into and out of the cell and allows the cell to change shape.

The **nucleus** of the cell acts as the control center, directing all of the cell's activities and is usually located near the center of the cell. The nucleus is surrounded by a protective membrane called the **plasma membrane**. Genetic (hereditary) information is organized into threadlike structures called **chromosomes**. Each chromosome is made of DNA and proteins and may contain many different genes which hold the information to run the cell. **Genes** are units of genetic information that determines the specific characteristics of an individual. Within the nucleus there is a **nucleolus** which is a spherical structure found within some cells and is involved in the making of proteins and DNA.

The **cytoplasm** is a jelly-like area of the cell between the nucleus and the cell membrane which helps organelles move throughout the cell. Nutrients are absorbed, transported, and processed within the cytoplasm. The cytoplasm contains a number of different organelles that each have a specific form and function. An **organelle** is a specialized structure inside a cell.

Mitochondria are tiny, bean-shaped structures that have a greatly folded inner membrane and transform sugars into energy. They are considered to be the work horses of the cells because they provide the energy to run the cell.

The **ribosome** is essential for cell growth and reproduction as it builds proteins necessary for these processes to occur. They are made mostly of RNA and produced in the nucleolus. The **endoplasmic reticulum** is a series of "canals" or tube-like passageways that carry proteins from the ribosomes and transport them throughout the cell. The **Golgi apparatus** is a structure that stores proteins until they are needed for use inside or outside the cell.

Lysosomes are small round structures found in the cytoplasm and contain digestive enzymes that break down large food particles into sugars and other simple substances. The last organelle that is found in the cytoplasm are **centrioles** which are only found in animal cells and are small protein structures necessary in the process of cell division.

The plant cell contains all the organelles found in animal cells plus a few other structures. The cell membrane of a plant cell is surrounded by a **cell wall** which is composed of a rigid material called

cellulose. The cell walls protect and support the plant cells. Gases, water and some minerals can pass through small pores (openings) in the cell wall.

Immediately inside the cell wall is the cell membrane; however you usually cannot see it when you examine plant cells with a microscope.

Both animal and plant cells contain a vacuole, but in plant cells they are much larger. A **vacuole** is a fluid-filled space containing water, sugar, minerals, and proteins. Plant cells also contain **chloroplast** which contains chlorophyll used in photosynthesis.

Outside the cell membrane, some cells have a flagellum (plural: flagella), a whiplike tail that helps the cell move. Some cells have many hairs, called **cilia**, the either move the cell or the environment surrounding the cell. The cilia usually work together.

3. Directions: Using the information above match each part of the cell with the correct letter description/definition.

_____ Cytoplasm	A. Structure that is used during cell division.
_____ Lysosome	B. Stack of membranes that stores proteins.
_____ Mitochondria	C. Membrane that protects the nucleus.
_____ Centriole	D. Membrane that surrounds and protects the cell.
_____ Endoplasmic reticulum	E. Sac filled with digestive chemicals.
_____ Vacuole	F. Structures that converts nutrients to energy.
_____ Plasma Membrane	G. Passageways where proteins are transported through.
_____ Nucleus	H. Jelly-like substance within the plasma membrane.
_____ Ribosome	I. Structure that manufactures proteins and DNA.
_____ Nucleolus	J. Structure that contains DNA and directs the cell.
_____ Golgi apparatus	K. Small structure that synthesizes proteins.
_____ Cell membrane	L. Sac that stores sugar, water, and minerals.

4. Directions: Fill in the name of the organelle or organelles that perform each of the following functions.

- _____ convert sunlight to chemical energy.
- The _____ and the _____ help to support the plant cell and help it to maintain its shape.
- _____ store food or pigments.
- The _____ converts food into energy. It is found in both plant and animal cells.
- The _____ regulates molecular traffic into and out of the cell.
- Cells are able to move by _____ which works as a tail whipping or many hair like objects called _____ that all work together.
- The thread-like structures called _____ contains the genetic (hereditary) information.