

Name \_\_\_\_\_

Date \_\_\_\_\_

## Parts of a Cell

Consider how many different species live on our planet. For so many organisms to thrive, there must be a great deal of organization. Now, imagine just one living thing: a human being. Compared to the complex world we live in, the human body may seem very simple. But for a single human to grow, develop, and live, the body must be extremely organized. Part of that organization is accomplished through our D.N.A., which work like blueprints for our bodies. D.N.A. tells our cells how to grow and work. However, our cells have a structure of their own.

The cell is the smallest living unit in the human body, and all cells need specific parts to function. Some of these parts are called organelles. Today you will learn the name of each organelle, and what role it plays in a cell. You will also learn about other materials in a cell, and what jobs they perform.

Let's start from the outside and work inward. The outer wall of an animal cell is called the **cell membrane**. It is called a membrane because certain materials can pass through it and into or out of the cell. Plant cells do not have cell membranes. They have cell walls, which do not allow material to move in and out.

A cell is able to keep its shape because it has a structure called the **cytoskeleton**. The cytoskeleton works just like the human skeleton. It provides a framework for the rest of the cell. It is made up of thick tube-shaped proteins called **microtubules**, and thinner, string-like proteins called **microfilaments**.

Like any unit of life, cells need energy. The **mitochondria** are often called the power plants of the cell. Many of the reactions needed to create energy take place inside each mitochondrion. For example, nutrients are broken down inside the mitochondria to produce energy that powers the rest of the cell.

**Ribosomes** help to make protein for the cell. They work like links in a chain, connecting amino acids together to create protein. These proteins are an essential part of our D.N.A.

The **Golgi bodies**, or **Golgi apparatus** have more than one job. They provide energy for the cell, and store energy for later use. This energy comes from complex molecules that the Golgi bodies build from smaller, simple molecules. They also build lysosomes.

How does the cell turn food into nutrients the mitochondria can use to produce energy? Another organelle has that essential job. The organelles responsible for digesting material are called **lysosomes**. They contain enzymes that break down food into smaller parts the cell can use. If food doesn't enter the cell, the lysosomes will digest other organelles inside the cell to keep it alive.

## Parts of a Cell (Cont'd)

**Perixomes** are very similar to lysosomes. They also digest material, but they are better at breaking down fatty acids and toxic material, like alcohol.

What if a cell has too much food? Or what if the organelles produce waste that can contaminate the rest of the cell? That's when the organelles called **vacuoles** are needed. Vacuoles are bubbles inside the cell where material can be stored. These tiny storage units can be used to hold surplus nutrients or waste waiting to be removed from the cell.

Nutrients and other material need a way to travel around a cell. Some organelles do this part of the job, but there is also a superhighway called the **Endoplasmic Reticulum**, or **E.R.** The E.R. is a collection of membranes that allow materials to travel all around the cell. The E.R works closely with the Golgi bodies and ribosomes. In fact, a certain kind of E.R., called Rough E.R. is covered in ribosomes. These ribosomes help the E.R. create and transport proteins.

Another way material travels around the cell is through the cytoplasm. Cytoplasm is not an organelle, but it is an essential part of the cell. Cytoplasm is a jelly-like liquid in the cell. The organelles and material inside the cell float around in the cytoplasm, which contains water and other nutrients.

In order to help our bodies grow and stay alive, cells must divide. To do this they need two organelles called **centrioles**. Centrioles are always present in the cell, though they may be hard to see. When the cell is ready to divide, the centrioles move to different sides of the cell. They help to separate the cell and create two identical cells.

Finally, we have the most important organelle of all, the **nucleus**. The nucleus is the brain of the cell. It controls all the activity inside the cell and contains the cell's D.N.A. To be sure it is very safe, the nucleus is surrounded by a barrier called the **nuclear membrane**. The membrane keeps cytoplasm out of the nucleus and protects it from contamination.

### Summing up

For every single part of your body, there are special cells that tell your body how to live and develop. The cells that grow your hair are different from the cells of your heart. You have cells that make up your lungs, and cells that build your bones. Each cell has a job, and can only complete its work if the tiny organelles inside perform their many tasks. We have only touched the surface of the complex processes that take place inside of a cell. The worksheet that follows will help you test your knowledge, but keep exploring. You may be surprised to find out how much is happening every moment inside every cell in your body.

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## Parts of a Cell Questions

### Fill in the blank.

1. \_\_\_\_\_ are the parts of a cell that carry out tasks and help the cell work.
2. The nucleus of the cell contains \_\_\_\_\_, which are the blue prints that tell our cells what to do.
3. To multiply and grow in number, cells must \_\_\_\_\_.
4. Cytoplasm is made up of \_\_\_\_\_ and other nutrients.

### Match the name of the cell part to its definition.

- |                              |   |
|------------------------------|---|
| 1. ___ Nucleus               | A. Membranes that help material travel around the cell            |
| 2. ___ Cytoplasm             | B. Package and store energy and build lysosomes                   |
| 3. ___ Vacuoles              | C. organelles that break down fatty acids and toxic material      |
| 4. ___ Microfilaments        | D. Framework that gives cell its shape                            |
| 5. ___ Peroxisomes           | E. Jelly-like material that fills the cell                        |
| 6. ___ Nuclear Membrane      | F. Tube-shaped proteins that help form the cell's structure       |
| 7. ___ Endoplasmic Reticulum | G. Produce energy that powers the rest of the cell                |
| 8. ___ Lysosomes             | H. bubbles inside the cell where material can be stored           |
| 9. ___ Golgi Bodies          | I. Outer layer of cell, allows material to move in or out of cell |
| 10. ___ Centrioles           | J. Known as the brain of the cell, directs all activities         |
| 11. ___ Mitochondria         | K. Link amino acids together to build proteins                    |

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### Parts of a Cell Questions (Cont'd)

12. \_\_\_ Microtubules

L. Barrier that separates the nucleus from the rest of the cell

13. \_\_\_ Cytoskeleton

M. String-like proteins that help form the cell's structure

14. \_\_\_ Ribosomes

N. Contain enzymes that help digest food

15. \_\_\_ Cell Membrane

O. Help to separate the cell and create two identical cells

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## Parts of a Cell Answers

### Fill in the Blank

1. Organelles
2. D.N.A.
3. Divide
4. Water

### Matching

1. J
2. E
3. H
4. M
5. C
6. L
7. A
8. N
9. B
10. O
11. G
12. F
13. D
14. K
15. I