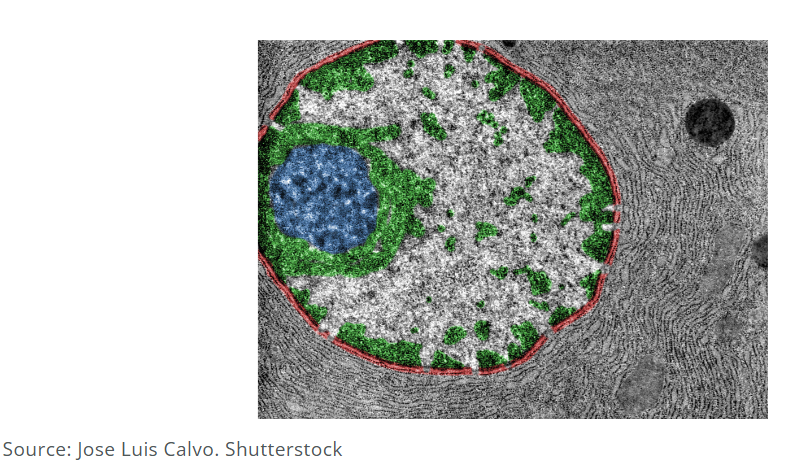
**Unit 2: Cells**

**Guided Notes: Characteristics of Cells**

**Big Idea:** All living things are made up of building blocks called \_\_\_\_\_\_\_\_\_\_.

**Key Concepts:**

* A \_\_\_\_\_\_\_\_\_\_ is the smallest unit that can be considered alive.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ describes the three criteria for determining living things.
* The five \_\_\_\_\_\_\_\_\_\_ of living things are the criteria that an object must have to be considered alive.
* \_\_\_\_\_\_\_\_\_\_ organisms consist of many cells of different types.
* \_\_\_\_\_\_\_\_\_\_ organisms consist of one cell.

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**Real World Examples:**

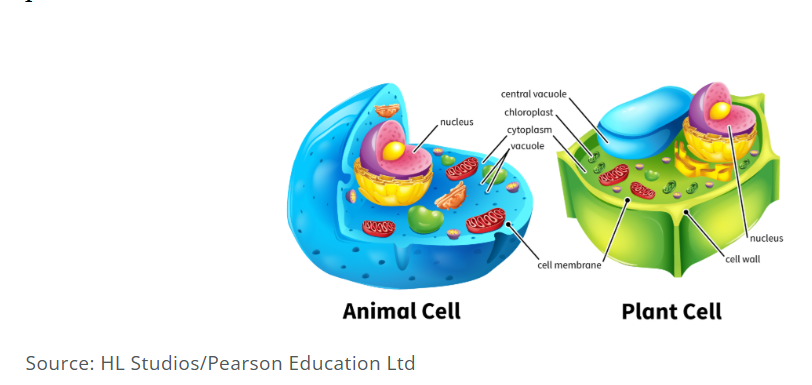
1. A house is made of pieces of wood, bricks, or stone building blocks. Similarly, living things are made up of building blocks called \_\_\_\_\_\_\_\_\_\_.
2. During the flu season, many people get sick because the influenza \_\_\_\_\_\_\_\_ (a nonliving particle that infects a cell and causes the cell to make multiple copies of the virus).

**Guided Notes: Plant and Animal Cells**

**Big Idea:** The main idea of this lesson is to compare the \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ of plant and animal cells.

**Key Concepts:**

* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ surrounds a cell and is also called a cell membrane.
* \_\_\_\_\_\_\_\_\_\_ are specialized cell parts within cells.
* \_\_\_\_\_\_\_\_\_\_ is the gelatin-like fluid that fills a cell and contains all the organelles except for the nucleus.
* The \_\_\_\_\_\_\_\_\_\_ supports the structure of a cell and gives it its shape.
* The \_\_\_\_\_\_\_\_\_\_ is a large organelle that contains the hereditary material of a cell.
* The \_\_\_\_\_\_\_\_\_\_ is an organelle where cellular respiration takes place.
* \_\_\_\_\_\_\_\_\_\_ are small organelles that produce proteins.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ modifies and packages proteins and lipids for transport.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ has attached ribosomes and is involved in the transport of materials.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ has smooth surfaces and transports materials.
* \_\_\_\_\_\_\_\_\_\_ are green organelles where photosynthesis takes place in plant cells.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ is a large sac in plant cells that stores water and maintains internal cell pressure.
* \_\_\_\_\_\_\_\_\_\_ are small organelles that take part in cell division.

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**Real World Examples:**

1. Think of the \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ like a balloon inside a box. When the balloon is full, it presses against the sides of the box, making it rigid. This is similar to how the \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ provides support to a plant cell.

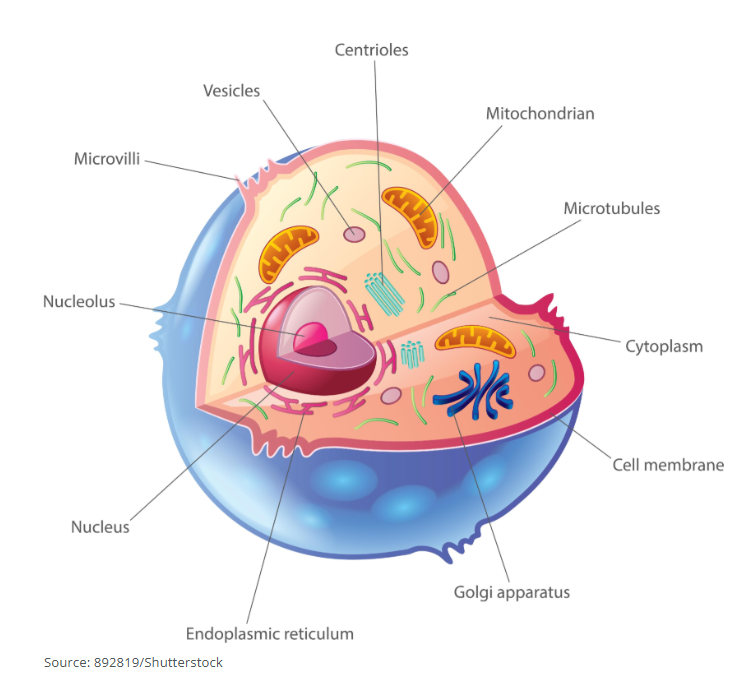
2. Imagine a plant’s leaves turning brown in the fall. This happens because the \_\_\_\_\_\_\_\_\_\_ in the leaves can no longer retain the nutrients needed when sunlight becomes less available.

**Guided Notes: Modeling Cells**

**Big Idea:** Cells are the basic building blocks of all living things, and they contain smaller parts called \_\_\_\_\_\_\_\_\_\_\_\_ that each perform specific functions necessary for life.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_ are specialized cell parts within cells.
* \_\_\_\_\_\_\_\_\_\_ is the gelatin-like fluid that fills a cell and contains all the organelles except for the nucleus.
* The \_\_\_\_\_\_\_\_\_\_\_\_ is the large structure in the cell that contains the hereditary material.
* \_\_\_\_\_\_\_\_\_\_\_\_ is the hereditary material in a cell that carries instructions for making proteins.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ surrounds and protects the nucleus.
* \_\_\_\_\_\_\_\_\_\_\_\_ are small structures that occur freely or are attached to the endoplasmic reticulum and function in protein synthesis.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a network of membranes with attached ribosomes that processes and modifies proteins and transports them throughout the cell.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a network of membranes having smooth surfaces that transports materials other than proteins.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ transports, modifies, and packages proteins and lipids in a cell.
* \_\_\_\_\_\_\_\_\_\_\_\_ are organelles in which cellular respiration takes place, providing energy for the cell.



**Real World Examples:**

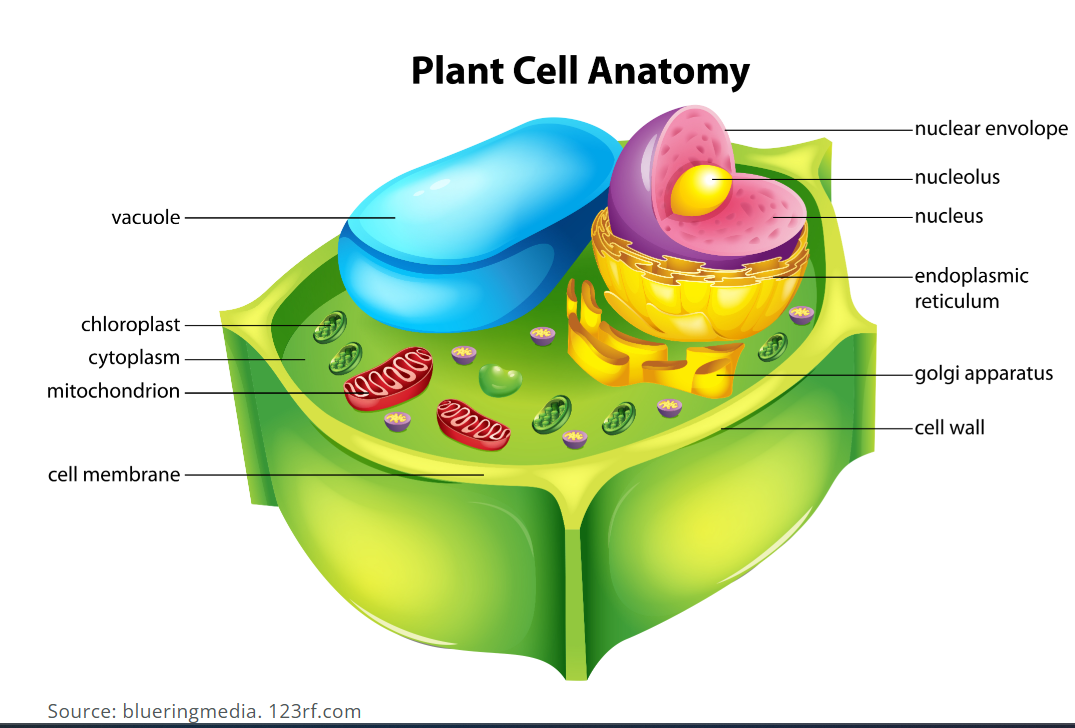
1. Imagine your school is like a cell. The principal's office would be the \_\_\_\_\_\_\_\_\_\_\_\_, where all the important decisions are made, and instructions are given out.
2. Think of your school's cafeteria. It can be compared to the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ because it processes and serves food (proteins) to the students (cell).

**Guided Notes: Organelles**

**Big Idea:** Cells contain various \_\_\_\_\_\_\_\_\_\_\_\_ that each perform specific functions necessary for the cell’s survival and overall function.

**Key Concepts:**

* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a tough and rigid structure that surrounds a plant cell but not an animal cell. It provides shape, support, and protection.
* The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ surrounds all cells, holding the cell together and controlling which substances go in and out.
* \_\_\_\_\_\_\_\_\_\_\_\_ is the gelatin-like fluid that fills the inside of a cell, along with the organelles other than the nucleus.
* The \_\_\_\_\_\_\_\_\_\_\_\_ is where the cell’s genetic material is stored.
* \_\_\_\_\_\_\_\_\_\_\_\_ are organelles in which cellular respiration takes place, providing energy for the cell.

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**Real World Examples:**

1. Imagine your school is like a cell. The school fence or walls would be the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_, providing protection and support to the entire school.
2. Think of your classroom. The door to your classroom can be compared to the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ because it controls what comes in and out of the room.

**Guided Notes: Unicellular and Multicellular**

**Big Idea:** Unicellular organisms have bodies made of only \_\_\_\_\_\_\_\_\_\_\_\_ cell, while multicellular organisms have bodies made of \_\_\_\_\_\_\_\_\_\_\_\_ cells, each specialized for different functions.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is the reproduction of a cell by division into two equal parts.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is an organelle in a unicellular organism that expels water from the cell.
* \_\_\_\_\_\_\_\_\_\_\_\_ organisms have many cells.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a single-celled organism classified in Kingdom Protista.
* A \_\_\_\_\_\_\_\_\_\_\_\_ is a temporary projection of cytoplasm that serves in locomotion in an amoeba.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a specialized cell that carries oxygen in the blood.
* \_\_\_\_\_\_\_\_\_\_\_\_ organisms have one cell.
* A \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a specialized cell that fights infection.

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**Real World Examples:**

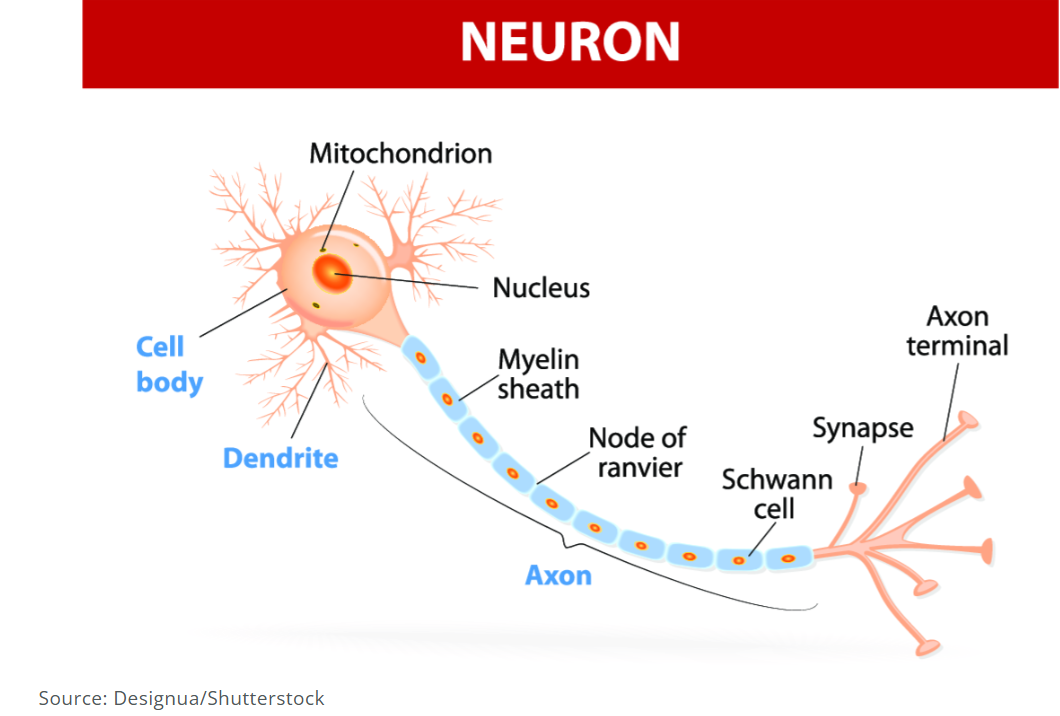
1. Imagine your school is like a multicellular organism. The janitor is like a \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ because they help clean up and fight off "infections" (messes) in the school.
2. Think of a sports team. The players are like \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ because they each have a specific role (like carrying oxygen) and work together to win the game.

**Guided Notes: Specialized Cells**

**Big Idea:** Multicellular organisms use specialized \_\_\_\_\_\_\_\_\_\_\_\_ to perform complex life functions, with each type of cell having a unique \_\_\_\_\_\_\_\_\_\_\_\_ that helps it do its job.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ — long tail-like part of a nerve cell
* \_\_\_\_\_\_\_\_\_\_\_\_ — finger-like projections on a nerve cell body
* \_\_\_\_\_\_\_\_\_\_\_\_ — having many cells
* \_\_\_\_\_\_\_\_\_\_\_\_ — nerve cell
* \_\_\_\_\_\_\_\_\_\_\_\_ — having one cell

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**Real World Examples:**

1. Imagine your school is like a multicellular organism. The teachers are like \_\_\_\_\_\_\_\_\_\_\_\_ because they send messages and instructions to students, just like nerve cells transmit messages in the body.
2. Think of your favorite basketball team. The players are like \_\_\_\_\_\_\_\_\_\_\_\_ because each player has a specific role, just like different types of cells have specific functions in the body.

**Guided Notes: Mitosis**

**Big Idea:** Mitosis is the process by which body cells \_\_\_\_\_\_\_\_\_\_\_\_ to allow for growth and \_\_\_\_\_\_\_\_\_\_\_\_ in multicellular organisms.

**Key Concepts:**

* \_\_\_\_\_\_\_\_\_\_\_\_ — a disease that occurs because of uncontrolled mitosis
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ — a sequence of stages in the life of a cell
* \_\_\_\_\_\_\_\_\_\_\_\_ — the process by which body cells divide
* \_\_\_\_\_\_\_\_\_\_\_\_ — a mass of cancer cells that form as cancer cells divide repeatedly

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**Real World Examples:**

1. Imagine your body is like a construction site. The workers are like cells undergoing \_\_\_\_\_\_\_\_\_\_\_\_, constantly building and repairing structures to keep the site functioning.
2. Think of your skin. When you get a cut, your skin cells undergo \_\_\_\_\_\_\_\_\_\_\_\_ to produce new cells that repair the wound.