

Cells

Teacher Information

The study of cells is called **cytology**. Cytologists, back in the 1800s developed a theory called the cell theory. The theory states that 1. All living things are made of cells
2. Cells are the simplest units capable of independent life. and 3., All organisms come from cells. This theory is still true with one little exception, that of viruses. Viruses are only alive while infecting a cell.

Cells are 90% water, the remaining 10% is protein, carbohydrate, nucleic acid, lipid, and other. Protein makes up 50% of the remaining 10%.

Cell size is measured in **micrometres**. A micrometre is one-millionth of a metre. There are one thousand micrometres in one millimetre. The symbol for one micrometre is **µm**. The largest single cell is the ostrich egg.

Most species of organisms are composed of millions of cells. As previously mentioned there are *unicellular* life forms, such as the protozoa. *Multicellular* organisms include most plants and animals.

Cells differ from one another in their appearance; but, all cells have similar internal parts known as **organelles**. All cells are surrounded by a **membrane** that encloses a jelly-like substance called **cytoplasm**. Cytoplasm is about 70% water. A cell's membrane keeps the cell together. It also allows some things to enter and leave the cell - food.

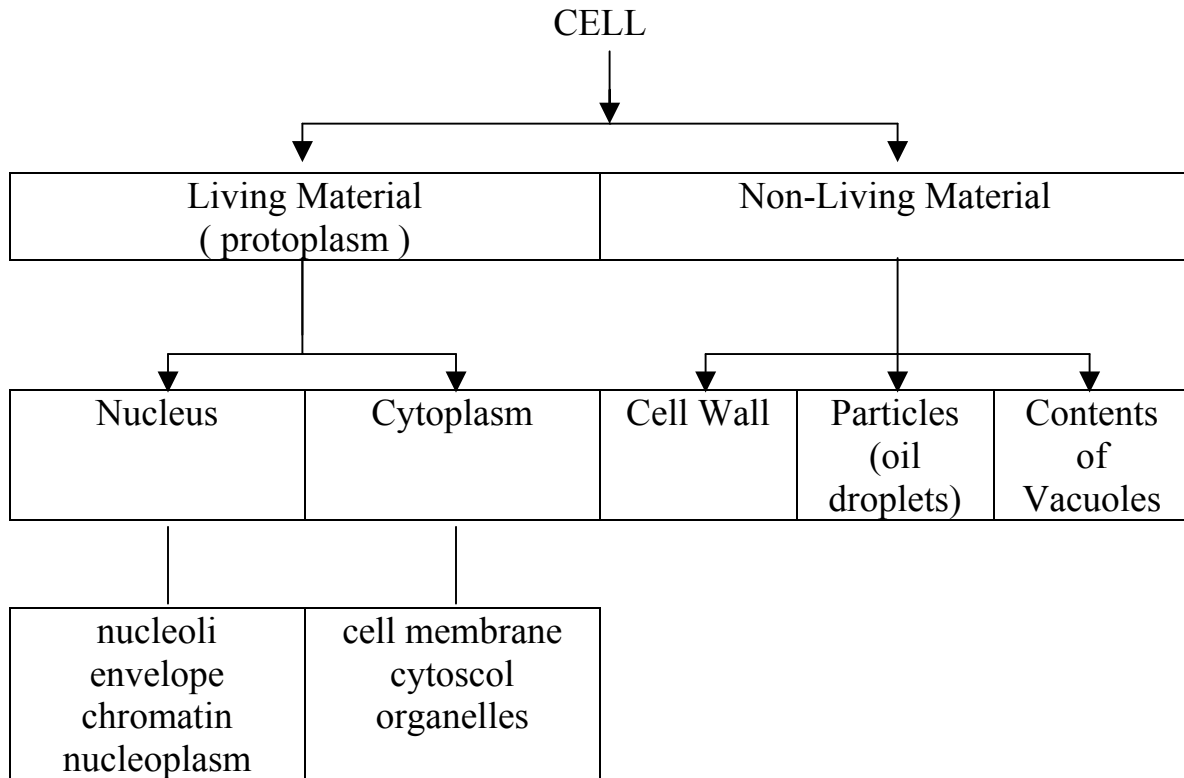
Cells vary in size, shape, and function, and there is no single common cell; however, all plant and animal cells have certain features in common.

Comparing Plant and Animal Cells

FEATURE	PLANT CELL	ANIMAL CELL
Outside support	Thick hard cell wall	Thin flexible cell membrane
Vacuoles	Often just a few large ones	Usually many small ones
Nucleus	Yes	Yes
Cytoplasm	Yes	Yes
Cell Membrane	Yes	Yes
Vacuoles	Yes	Yes

Green plants would also have **chloroplasts**. Under a microscope chloroplasts appear to be green in colour.

All cells are made up of both the *living* material and the *non-living* material.



Cell Structure

<i>Protoplasm</i>	<ul style="list-style-type: none"> -jelly-like substance that makes up most of the cell -70% water, 30% other material -living material of cell -life processes occur here -contains "little organs" called organelles -certain <i>organelles</i> carry out certain duties -protoplasm located outside the nucleus is known as <i>cytoplasm</i>
-------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<i>Nucleus</i>	<ul style="list-style-type: none"> -most cells contain a nucleus -oval body shape -"control centre" for all duties -<i>nuclear membrane</i>-surrounds nucleus <ul style="list-style-type: none"> -contains pores that allow the exchange of material between nucleus and cytoplasm
Nucleolus	<ul style="list-style-type: none"> -is contained within the nucleus and floats within the nucleoplasm -made of DNA, RNA, and protein
Nucleoplasm	<ul style="list-style-type: none"> -cytoplasm contained within nucleus
Chromatin	<ul style="list-style-type: none"> -contained throughout nucleus -will eventually form chromosomes
Plasma Membrane	<ul style="list-style-type: none"> -also known as cell membrane -it functions to: <ul style="list-style-type: none"> -separate cell from outside environment -hold contents of cell together -allows material to pass in and out of cell
Endoplasmic Reticulum	<ul style="list-style-type: none"> -a network of tube-like structures -consists of double membranes lying parallel to one another -it functions to transport material <i>within cell</i> from nuclear membrane to plasma membrane