

Lesson
4

Plant and Animal Cells

The smallest unit of life

Supply list:

Option A: Paper models

- Colored construction paper
- Scissors
- Glue

Option B: 3-D models (messier but more fun)

For each child:

- Small shoe box
- 1 qt. plastic zipper bag
- Several green grapes
- 1 large red grape or marble
- Several raisins

For everyone to use:

- Yellow gelatin mix ** Note:
mix this gelatin according to the
package directions about an hour
before you plan to do the project.



All plants and animals have cells, but what is a cell? A cell is the smallest unit of an organism that can survive on its own. Understanding cells helps us to understand the detail and intricacies of what God created so we can appreciate how everything works together.

Animal cells have 5 structures or parts:

Cell membrane acts like the “skin” of the cell. It surrounds and protects the rest of the cell. It also recognizes other cells.

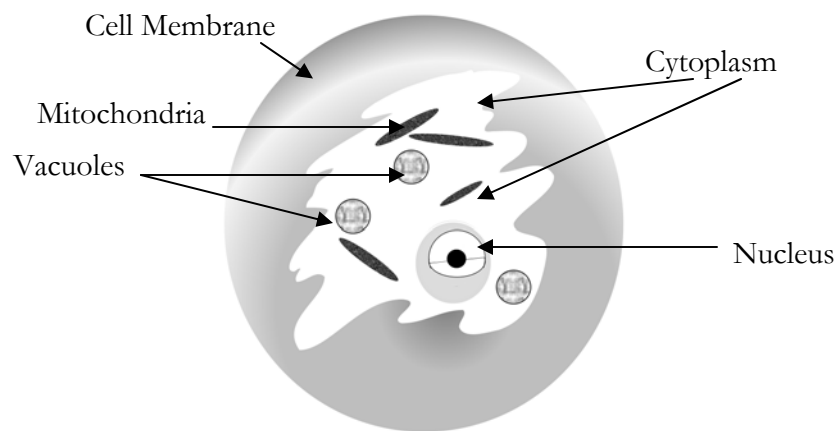
Nucleus is the “brain” of the cell. It is the control center of the cell. It also contains the genetic code used to produce new cells.

Vacuoles are storage “warehouses” that store food for the cell.

Mitochondria are the “power stations” of the cell. They break down the food and combine it with oxygen to produce energy for the cell.

Cytoplasm is the “transportation network” of the cell. It is the liquid that fills the cell and allows all the other parts of the cell to move around inside the cell.

Animal cells can have many different shapes depending on the function of the cell, but the majority of them are round as shown below.



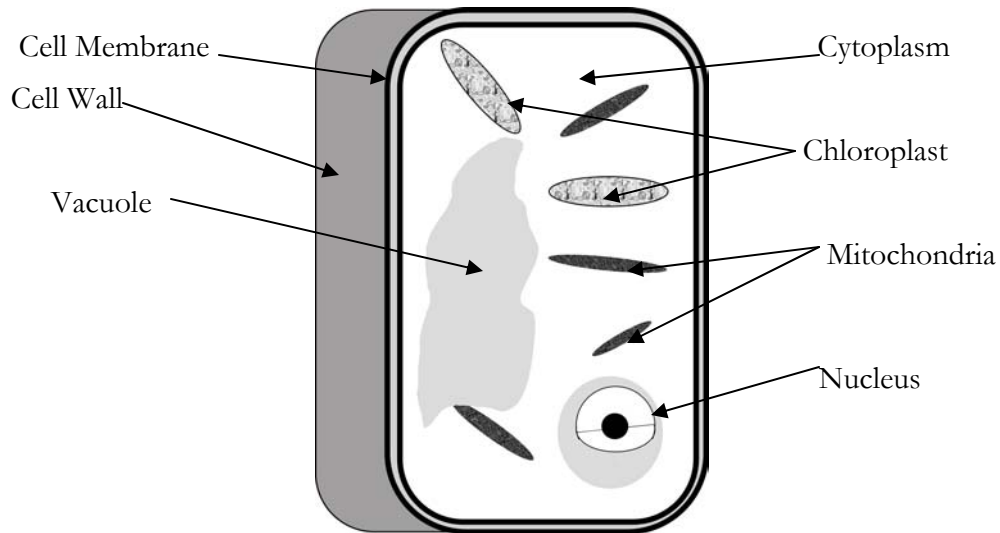
Animal Cell

Plant cells have the same structures as animal cells, as well as these 2 additional structures:

Cell wall provides support for the cell. It surrounds the cell membrane and gives it strength and form. This allows plants to be rigid even though they do not have a skeleton like most animals do.

Chloroplasts are the “power plants” of the cell. They make food using sunlight, chlorophyll, carbon dioxide, and water. This is a major factor in determining if a living thing is a plant or an animal.

Plant cells generally have a square or rectangular shape as shown below. The cell wall helps the plant cell hold its shape, which in turn helps the entire plant hold its shape.



Plant Cell

Even though each cell can function on its own, plants and animals were designed for cells to work together with other cells. A group of cells working together to perform a function is called a tissue. A group of tissues working together is called an organ. To appreciate how small a cell is, realize that one average tree leaf has approximately 50 million cells.



Making a Model of a Cell:

Option A: Construction Paper Model

Use different colors of construction paper for each part of the cell. Have your child cut pieces to resemble the pictures above and glue them together to make a model of each kind of cell. Be sure to make a rectangular cell with a cell wall and green chloroplasts for a plant cell and a round cell without those structures for an animal cell.

Option B: Gelatin Model

This option requires more supplies but is a lot of fun. First, mix the gelatin according to the box directions and place in the refrigerator for about 1 hour.

Give each child a zipper bag. Fill it about $\frac{3}{4}$ full of the thickened gelatin. The bag represents the cell membrane and the gelatin represents the cytoplasm.

Insert a red grape or a marble for the nucleus and several raisins for the mitochondria.

Allow your children to squish the ingredients around a little to see how the parts of the cell move. If they move most of the cytoplasm away from an area that would represent an empty space for a vacuole where food could be stored. This is your basic animal cell model.

To make a plant cell model, add several green grapes to represent chloroplasts. Then place the bag inside a small shoe box. The sides of the box support the bag and give it strength just as the cell wall does in a plant cell.

A tissue is made up of many cells combined to perform a specific function. Have your child stack several boxes together to make a tower representing a tissue. An organ is several tissues working together. Have your child stack more boxes together to make a bridge, pyramid, or other structure representing an organ.



What did we learn?

What parts or structures do all plant and animal cells have? (Cell membrane, nucleus, vacuoles, mitochondria, and cytoplasm.)

What structures are unique to plants? (Cell wall and chloroplasts.)

What distinguishes animal cells from plant cells? (Plant cells can perform photosynthesis and have cell walls but animal cells do not.)

Taking it further

A euglena is a single-celled living organism that can move around by itself. It eats other creatures, but it also has chlorophyll in its cell. Is it a plant or an animal? (Scientists do not agree on this and other unusual creatures. They usually put them in their own category called protists.)