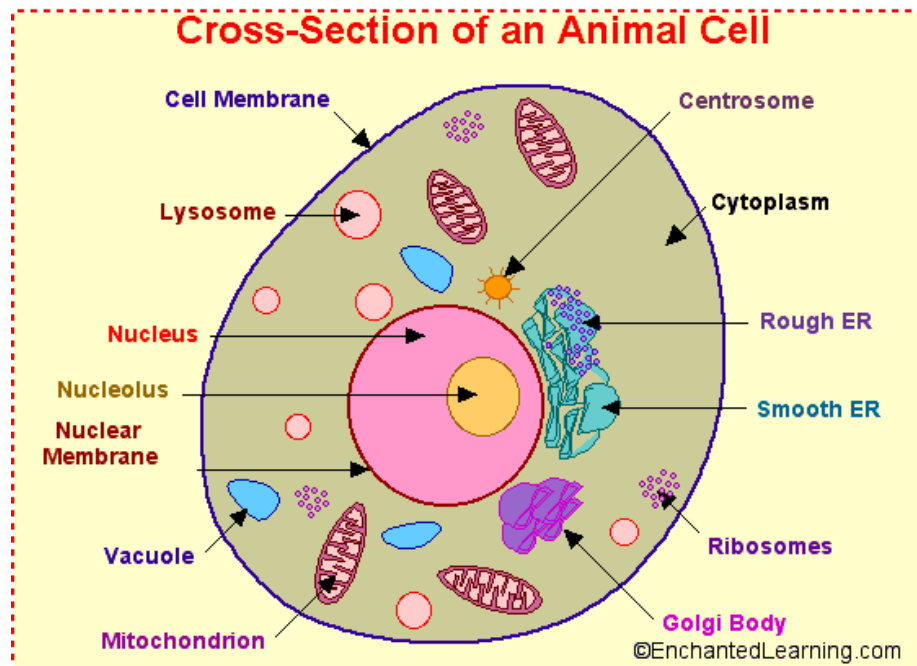


# The Incredible Edible Cell

## OBJECTIVES

1. Identify the structure of a cell
2. Describe components of a cell including cell membrane and cytoplasm
3. Describe appearance and function of different organelles within a cell including nucleus and mitochondria



## WHAT YOU WILL NEED

Prepared 1-2 days in advance:

- Jelly crystals
- Gelatine sachets
- Zip lock bag

Organelles (lollies)

- Jelly beans
- Sultanas
- Cake sprinkles
- Snakes
- Peanut M&Ms

Plant cell extension activity:

- Green leaves
- Chocolate coated almonds
- Plastic take-away container

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## WHAT TO DO

You have been provided with a cell membrane (zip lock bag) and cytoplasm (jelly), you need to make your cell with the organelles (lollies) listed in the table below. Use the diagram and Table 1 to help.

Once you have made your cell fill in Table 2: My Cell: structure and function. Use the Table 1 to work out what each organelle does. Write down which lollies you used to represent each organelle and how it relates to the structure/function of a cell.

**Table 2: My Cell: structure and function**

Cell part	Function	Material/lollies used	How does this relate to structure &/or function of a cell?
Plasma membrane	Cell barrier	Zip lock bag	Serves as an external semi-permeable cell barrier.
Cytoplasm		Jelly	Holds organelles within the cell
<b>Cytoplasmic organelles</b>			
The cell nucleus			
Mitochondria			
Ribosomes			
Endoplasmic reticulum			
Golgi apparatus			
Lysosomes			
Vacuoles			

## QUESTIONS

1. What are the three differences between an animal and plant cell?
2. Why are these differences necessary?
3. How would you represent these differences?
4. What is the purpose of the nucleus envelope?

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**Table 1: Cell parts: structure and function**

Cell part	Structure	Function
Plasma membrane (cell barrier)	Membrane made of a double layer of lipids (phospholipids, cholesterol, etc).	Serves as an external cell barrier; acts in transport of substances into or out of the cell.
Cytoplasm (scaffolding)	Cellular region between the nuclear and plasma membranes; consists of fluid cytosol, containing dissolved solutes and organelles	Holds organelles within the cell.
<b>Cytoplasmic organelles</b> (the metabolic machinery of the cell)		
The cell nucleus ( the information centre)	The cell nucleus is the largest organelle found in the cell. The nucleus is spherical in shape and separated from the cytoplasm by a double membrane called the nuclear envelope. The nuclear envelope isolates and protects a cell's DNA from various molecules that could accidentally damage its structure or interfere with its processing.	It houses the cell's chromosomes, and is the place where almost all DNA replication and RNA synthesis occur.
Mitochondria (the power generators)	Rodlike, double-membrane structures; inner membrane folded into projections called cristae.	Site of ATP synthesis; powerhouse of the cell
Ribosomes (protein production centres)	Dense particles consisting of two subunits, each composed of ribosomal RNA and protein; free or attached to rough ER	The sites of protein synthesis
Endoplasmic reticulum (macromolecule managers)	Membranous system of sacs and tubules.	Transport network for molecules targeted for certain modifications and specific destinations, as compared to molecules that will float freely in the cytoplasm.
Golgi apparatus (macromolecule managers)	A stack of smooth membrane sacs and associated vesicles close to the nucleus.	Packages, modifies, and segregates proteins for secretion from the cell, inclusion in lysosomes, and incorporation into the plasma membrane.
Lysosomes (cell destroyer)	Membranous sacs containing acid hydrolases.	Sites of intracellular digestion.
Vacuoles (food and waste storage)	A vacuole is a membrane-bound sac. In animal cells, vacuoles are generally small.  Vacuoles tend to be large in plant cells.	The vacuole plays a role in intracellular digestion and the release of cellular waste products.  In plant cells vacuoles play a role turgor pressure. When a plant is well-watered, water collects in cell vacuoles producing rigidity in the plant. Without sufficient water, pressure in the vacuole is reduced and the plant wilts.