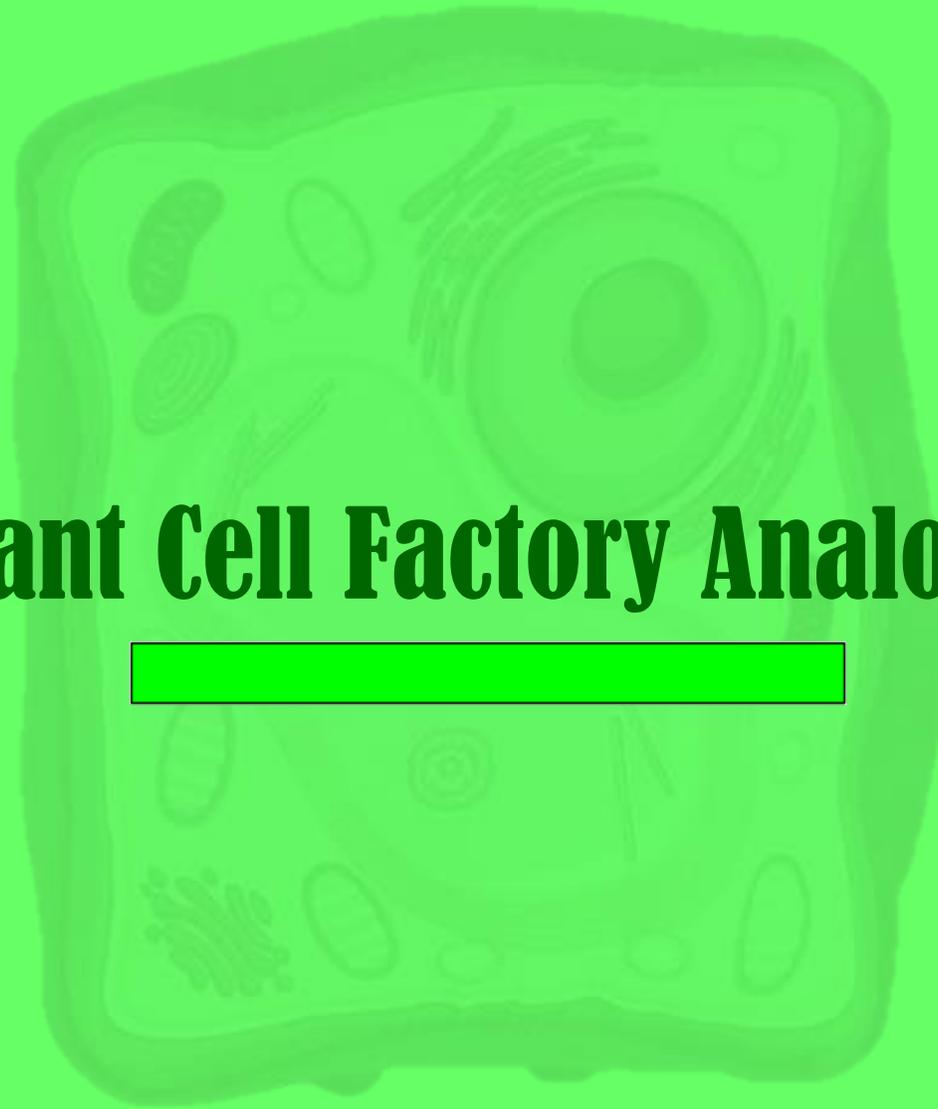


Plant Cell Factory Analogy



Introduction:

A cell is a lot like a factory. Each organelle plays an essential role in the function of the cell. Just like in an ice cream factory for example. In this presentation we will take you through each major organelle and how it functions as well as how it relates to an ice cream factory.

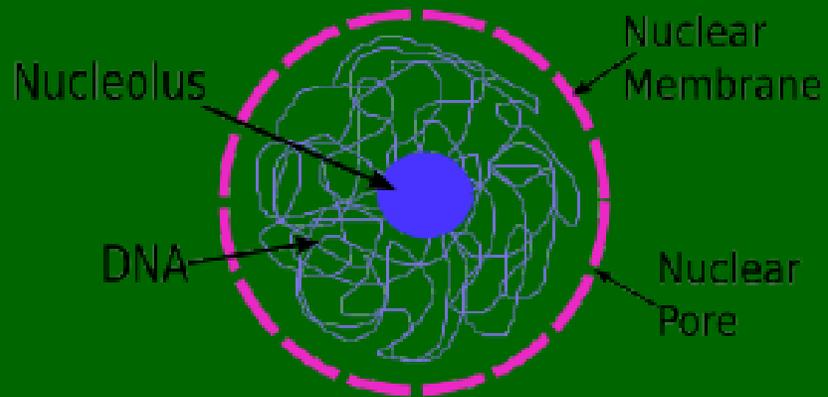


The Nucleus

“The Control Centre”

Just like the nucleus, the control centre makes sure everything does what it is supposed to do. It holds computers that hold information like the ice cream recipe and send messages to the rest of the factory. Its job is to ensure all the parts of the factory are doing what they are supposed to.

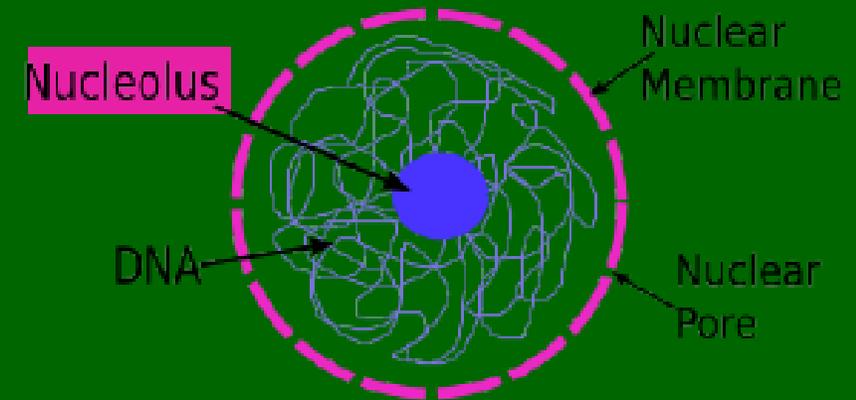
It's similar to how the nucleus holds DNA and manages the cell's growth and multiplication, the nucleus ensures everything is doing its job.



Nucleolus

“The Machine Manufacturer”

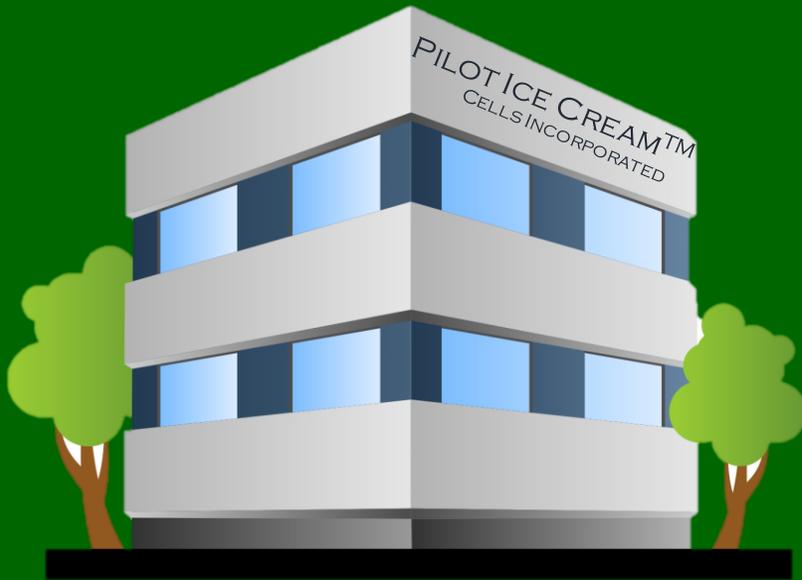
The nucleolus is like the machine manufacturer. It makes the machines that will later create the ice cream. This of course an essential but indirect part of the process but without it ice cream could not be made. This is like how the main function of the nucleolus is the production of ribosomes which will later create proteins. Proteins are essential to a cell as they make up much of a cell's structure.





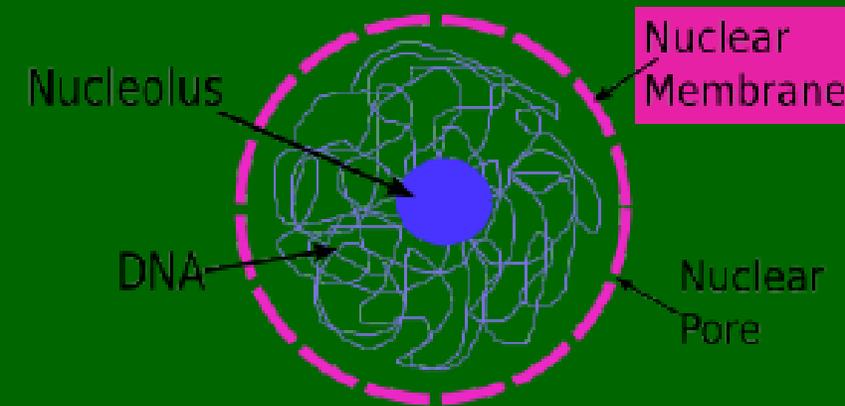
Nuclear Membrane

“The Control Centre Building”



The nuclear membrane functions like the building around the control centre. It contains everything in the control centre and keep unwanted people/items from coming in and damaging the contents.

Very similar to how the nuclear membrane contains and protects the nucleus from organelles and waste in the cytoplasm. The nuclear pores are like security guards. They only permit some things to enter, like the nuclear membrane because it is selectively permeable.

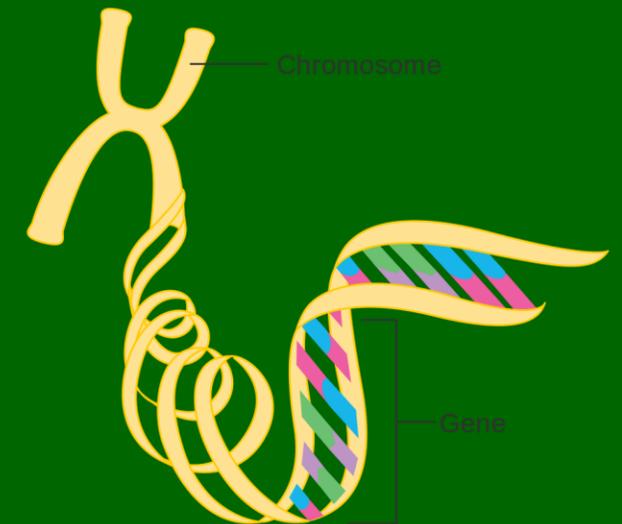


Chromosomes

“The Computer”

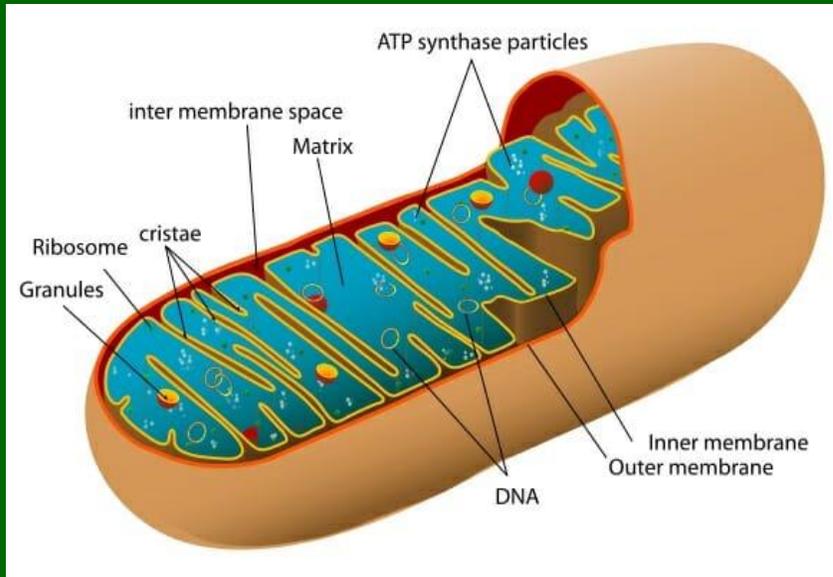
Chromosomes are like the computer in a factory. The computer holds all the information necessary for the factory to function. The ice cream recipe and instructions for the workers/machines. The computer can then send important information to different parts of the factory.

Chromosomes work in a similar way. They hold genetic code that sends messages to the rest of the cell. Codes that will result in the building of proteins, which make up much of a cell's structure.

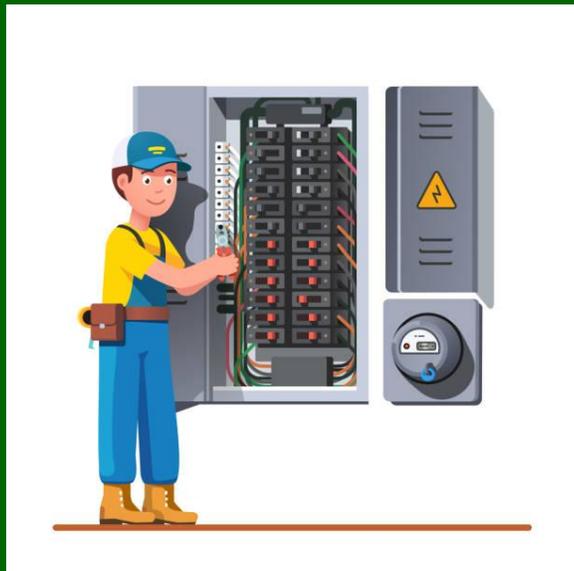


Mitochondria

“The Electrical Panel”



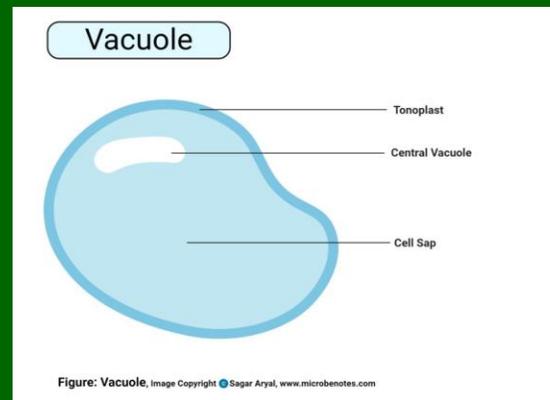
The mitochondria provides the needed power to the cell to have energy to survive and do the functions necessary. Therefore, it is known as the "powerhouse" of the cell. In relation to the ice cream factory the mitochondria is an electrical panel. Electrical panels are responsible for providing energy to factory so it can function properly.



Vacuole

“Warehouse”

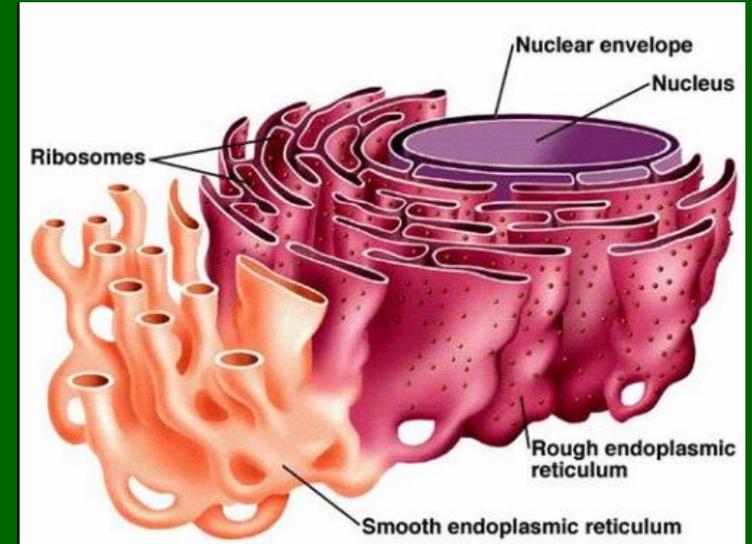
The vacuole's job is to store or dispose of different substances. They can store food and other nutrients necessary for survival. They can also contain waste products as the not containment the rest of the cell. The plant cell has one large vacuole. The vacuole's part in the factory is as a warehouse. For it stores ice cream that is ready to ship and it holds bad ice cream, so it won't get shipped and cause issues for the company



Endoplasmic Reticulum

“Processing of Ingredients”

The production, processing and transport of proteins and lipids are what the endoplasmic reticulum does. It then transports to different organelles such as; lysosomes, cell membrane, vacuole and Golgi apparatus. In an ice cream factory this would be where the ingredients of the ice cream are sorted and prepared to be make into ice cream. Basically, the processing of ingredients. Once that was done it would be transported elsewhere for other reason such as the actual production of ice cream, as the endoplasmic reticulum does.

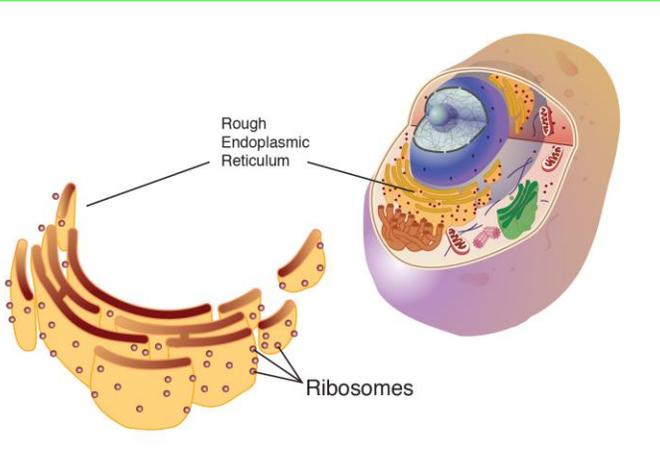




Ribosomes

“The Ice Cream Machines”

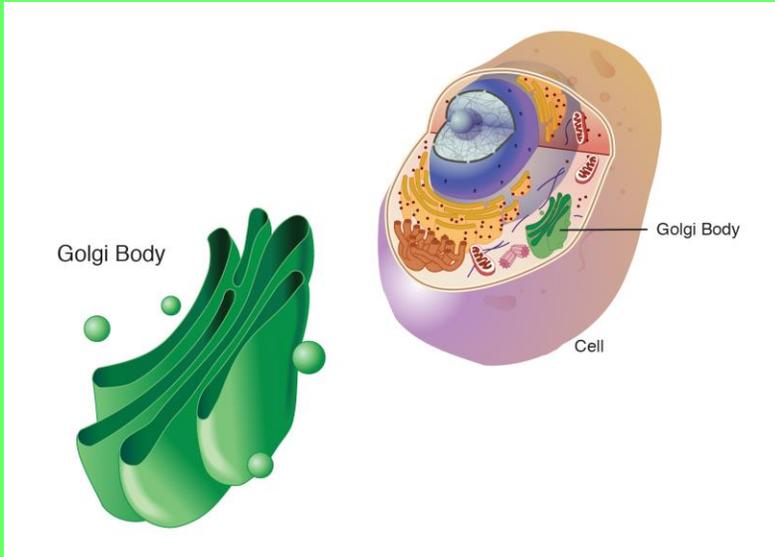
- In an ice cream factory machines that make the ice cream by adding the pasteurized milk and other ingredients then mixing it. Like an ice cream machine, ribosomes make proteins in a cell
- particle that is present in large numbers in all living cells and serves as the site of protein synthesis.
- Its main function is to produce protein which make up much of the cells structure and are required for activity's necessary for the cell's survival.
- Ribosomes are located floating in the cytoplasm and others are attached to the PR .





Golgi Body

“The Packaging Station”



- The Golgi body is like the packing station where the ice cream is packaged and labeled in a factory.
- Its functions are to sort and package proteins, and other molecular for transportation.
- Structure of the Golgi body: Its shape varies from cell to cell. It is large in nerve cell and small in muscle cells
- Located near the nucleus in the cytoplasmic matrix of almost all eukaryotic cells.

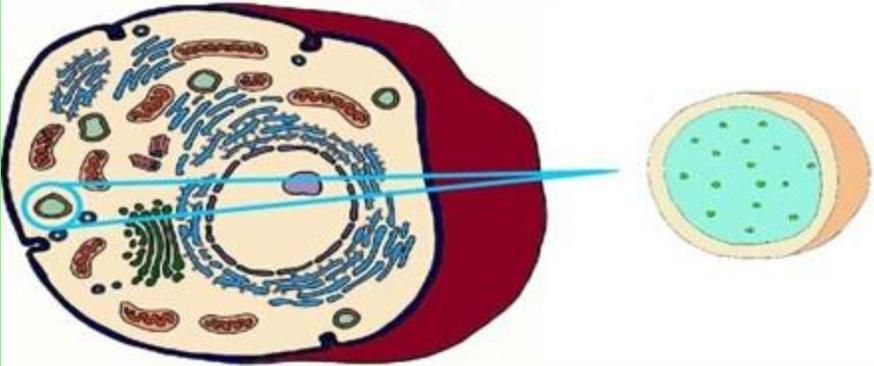




Lysosome

“Maintenance Crew”

Lysosome



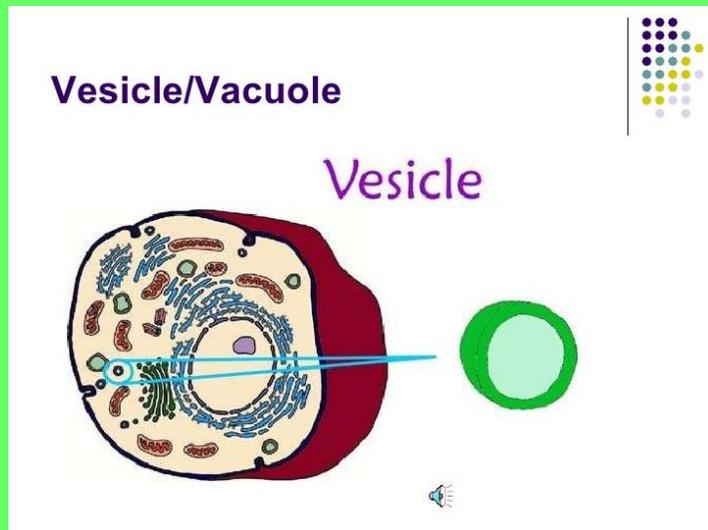
- Lysosomes are the maintenance crew of the ice cream factory. They ensure that any mess or potential danger is taken care of.
- Lysosomes are specialized vesicles within cells that digest large molecules using hydrolytic enzymes.
- Their function is to break down excess use to destroy invading viruses and bacteria.
- Lysosomes are found in nearly every animal-like eukaryotic cell but not as common in plant cells.
- They are found in the cytosol of the cytoplasm of a eukaryotic cell.

Vesicle

“Transportation Truck”



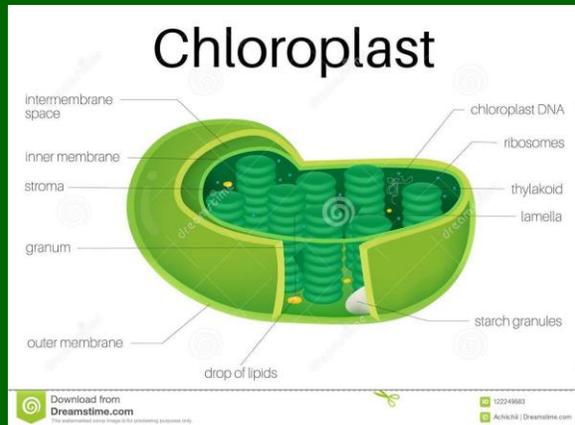
- The vesicle is like transportation truck in an ice cream factory, they also act as a storage while it's being transferred
- A vesicle is a large structure within a cell, or extracellular, consisting of liquid enclosed by a lipid bilayer.
- Vesicle function is organizing cellular substance, there involved in metabolism, transporting and temporary storage of good and enzymes.
- They can act as chemical reactions chambers from naturally process of secretion.



Chloroplast

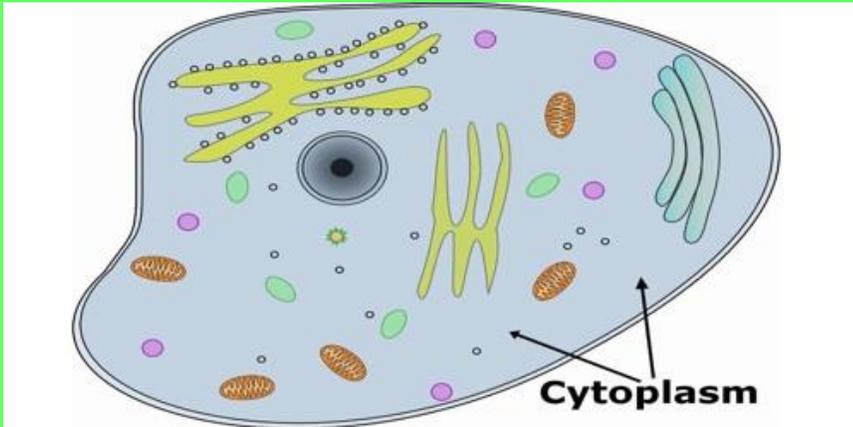
“Cafeteria”

After the hard work put into making ice cream the workers need a lunch break, they head to the cafeteria to eat. In a cell the cafeteria would be considered the chloroplast. For the chloroplast traps the sun's energy to make glucose. Glucose is essentially food for the cell.



Cytoplasm

“Factory Floor”



Cytoplasm: Includes the cytosol, and other life-supporting materials, such as sugar and water, all contained by the cell membrane.

Factory Floor: This is where all the activity happens. Products are made here, and all workers are found here.

The Cytoplasm acts as the Factory Floor, all the operations/activity and organelles can be found within it.



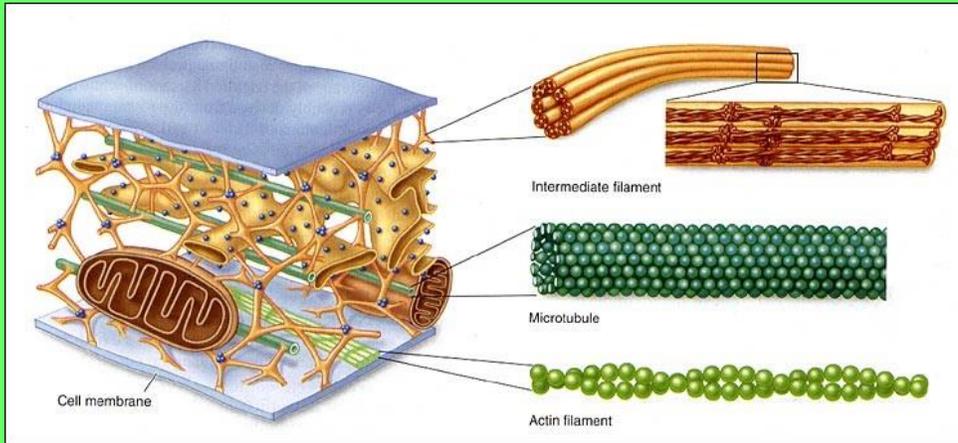
Cytoskeleton

“Support Beams”

Cytoskeleton: Filaments and tubules that provide a framework for the cell, helping it maintain its structure and provides "tracks" along which vesicles and organelles can move.

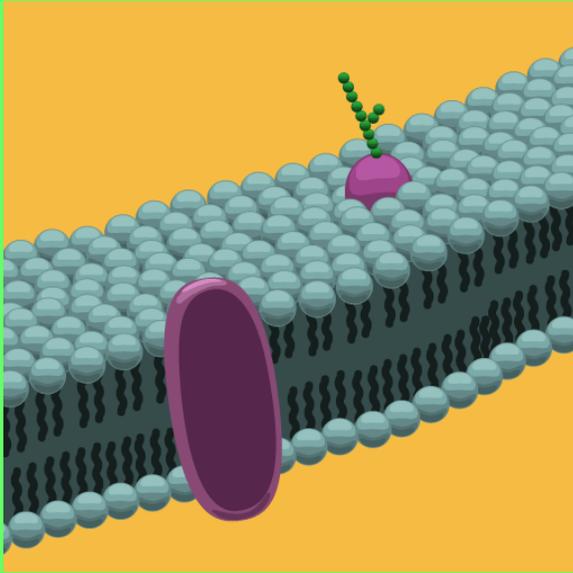
Support Beams: Supports the factory and are used for the main framework of the structure.

The Cytoskeleton acts as the support beams of the cell, it helps keep the shape and support the structure.



Cell Membrane

“Factory Security & The Factory Building”



Cell Membrane: Separates the inside of the cell from the external environment; controls the flow of materials into and out of the cell

Factory Security: Protects the products and makes sure there is no theft. Also makes sure nothing that is not allowed into the factory or is dangerous to the factory comes into the factory.

Factory Building: Buildings filled with machinery and workers working together to create ice cream

The Cell Membrane acts as both the Security as well as the Building itself, it will filter what can come in and out of the cell while also separating everything within the cells from the outside environment.

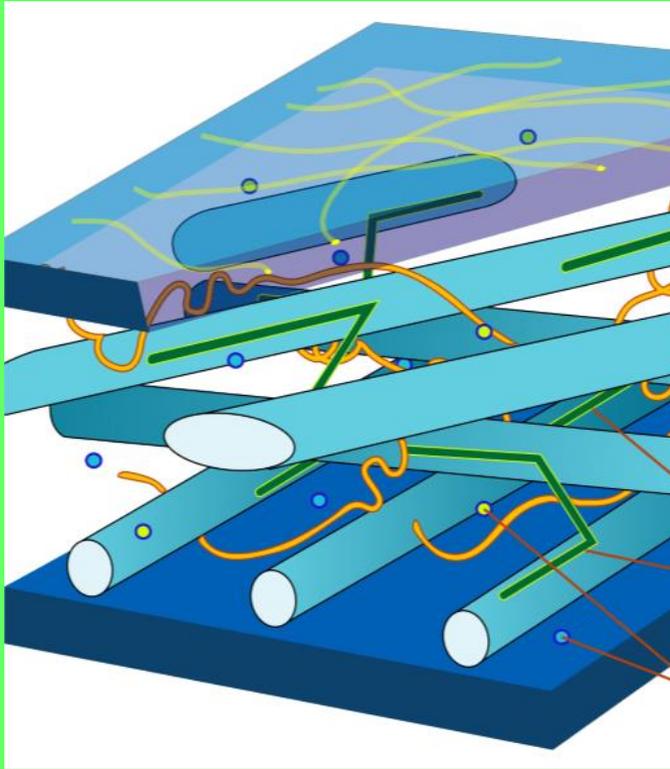
Cell Wall

“Factory Fence”

Cell Wall: A tough, rigid structure lying just outside of a plant cell's membrane; provides support for the cell.

Factory Fence: Encloses the factory and helps protect the factory from anything that may cause damage.

The Cell Wall acts like the fence of a factory, it separates the cell from other cells and adds more protection.



In Conclusion:

- All the organelles of a cell have a specific role
- Each is important to the function of the overall cell, like how every part of a factory needs to be working properly to do what it needs to do
- Each organelle can be explained as a part of a factory

Plant Cell Diagram:

