

Our Example (City Analogy):

Part of Cell	Description/Function	Analogy + Reasoning
Cell membrane	Made of a phospholipid bilayer (two back-to back layers of phospholipid molecules) that is polar on the outside and nonpolar on the inside. The membrane holds the cell together and is semi-permeable. This means that the membrane and the pores and proteins in it only allow some things to pass through.	Border guards - border guards only allow certain, specific things and people to pass through the border they protect.
Cell wall	Cell walls exist in plant cells, but not animal cells. They are stiff, made mostly of cellulose, and impermeable. Plants use them to build strength and support.	City wall - unlike the border guards, nothing can get through the city wall. The only entrance is through a gate.
Plasmodesmata	Small channels through the cell wall that allow for the transport of molecules in and out of the cell.	Gates in city wall - the only way through the tough city walls is through gates.
Nucleus	The nucleus is the cell's control center because it holds all the cell's DNA. DNA contains all the instructions and information that the cell needs to live, function, and reproduce.	Town hall - the town's government controls the operations of the town, and is located in the central government building: town hall.
Endoplasmic reticulum	Manufactures and processes various molecules necessary for the functioning of the cell.	Manufacturing center - the town's businesses and craftsmen make the supplies the town needs in this factory.
Ribosomes	Assemble the proteins the cell needs using instructions coded in RNA.	Engineers - they build things based on instructions
Golgi Apparatus	Receives molecules and proteins from the endoplasmic reticulum, then combines and packages them, and makes sure they are sent to the right places in the cell.	Post office - responsible for packing, organizing, and shipping mail and packages.
Mitochondria	The powerhouse of the cell. They intake nutrients, break them down, and create energy.	Power plant - takes in resources such as coal or uranium, then breaks them down and creates energy.

Chloroplast	Absorb sunlight to produce food, in the form of sugar, for the cell.	Farm - produces food for the town by growing plants. Plants grow by absorbing water and nutrients from the soil, and energy from sunlight.
Vacuole	Large, central sac that stores water and nutrients for the plant.	Water tower - is the primary water storage location for the town.
Lysosome	Breaks down and removes waste particles within the cell.	Garbage truck - collects and removes waste from the town.
Cytoskeleton	The cytoskeleton is made of microfilaments and microtubules. It provides structure and support for the cell, and paths for organelles to move along.	Roads - allow for large-scale transportation and movement within the town.
Peroxisomes	Break down harmful byproducts and molecules that are difficult to digest into useful materials.	Recycling center - here, waste, such as used paper, metal, and plastic, is broken down and converted into material that can be used again.