Parts of a Cell

All living things are made of cells. Each cell has certain **organelles** that have a certain **function**, or purpose for the cell. Plants are made up of cells that help them form their structure while also helping them make their own food through photosynthesis. Plant cells have a **cell wall** that both protects the cell and forms its structure. Plant cells also have **chloroplasts** that contain chlorophyll that is used to make food (energy) for the cell.

Animals (humans included) are made up of cells, too. Animal cells have a **cell membrane** that forms the outer boundary of the cell. It only allows certain materials into and out of the cell.

All cells contain **cytoplasm** which is a gel-like material inside the cell. It contains water and nutrients needed by the cell.

All cells have a **nucleus** that acts like the control center for the cell. Think of the nucleus as the ‘director’ of the cell: it directs all the activity and contains all the information needed for the cell to function. The nucleus has a **nuclear membrane** that surrounds the nucleus and protects it.

All cells also have a **mitochondria** which breaks down food and releases it as energy for the cell. Think of the mitochondria as the ‘muscle’ of the cell.

All cells also have **vacuoles** which act as a storage center for the cell. They can store extra energy (food), water, and any waste materials not needed by the cell right away.

All these parts of the cell (organelles) have a certain **function**, meaning its role or purpose for being in the cell.

Plant versus Animal Cells

Put a checkmark(s) if the organelle is in plant cells, animal cells, or both.

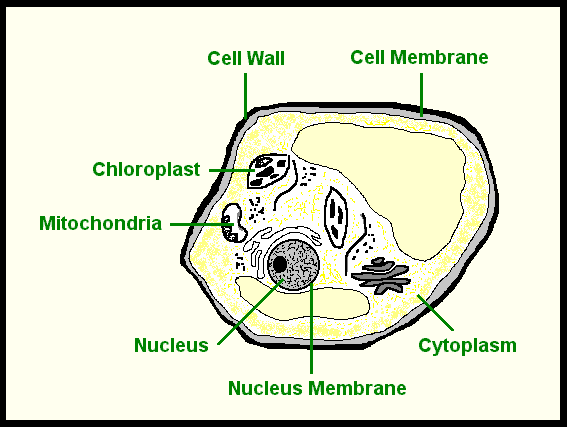
|  |  |  |
| --- | --- | --- |
| **Organelle** | Plants | Animals |
| Cell membrane |  |  |
| Cell Wall |  |  |
| Cytoplasm |  |  |
| Mitochondria |  |  |
| Vacuole |  |  |
| Chloroplasts |  |  |
| Nucleus |  |  |
| Nuclear Membrane |  |  |

How are the cell wall and the cell membrane alike?

How are chloroplasts and mitochondria alike?

How are the nuclear membrane and the cell membrane alike?

What do you think would happen if human cells had cell walls?



What type of cell is this? How do you know?

Describe the function of each of these organelles:

Nucleus:

Cytoplasm:

Chloroplast:

Cell Wall:

Mitochondria:

The Cell as a School

The **cell wall** acts like the brick wall surrounding our school; it provides structure and protects the people inside.

The **cell membrane** is like the doors at our school; they allow certain items (people) in and out of the school.

The **nucleus** acts like Ms. Faison; she directs all activity within the school just like the nucleus directs activity in the cell.

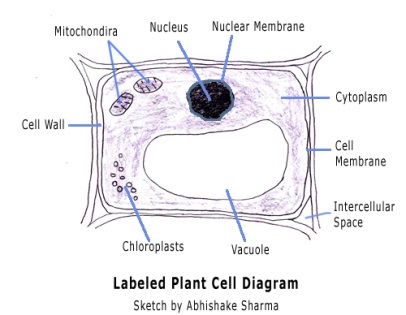
The **nuclear membrane** is like the main office at our school; the front office staff lets certain people in while not allowing others into see Ms. Faison.

The **cytoplasm** is like the floor of the school; it is where all the activity takes place.

The **chloroplasts** are like the lunch workers at our school; they give us energy by feeding us like the chloroplasts give plant cells energy in form of glucose.

The **mitochondria** is like the students at our school; they provide all the endless energy.

The **vacuoles** in cells are like storage closets in our school; they store materials for usage at another time.



Parts of a Cell

Fill in the blanks in the following chart:

|  |  |  |
| --- | --- | --- |
| Organelle | Function | Analogy to our school |
| Cytoplasm |  |  |
|  | Storage area for the cell |  |
| Cell Wall |  |  |
|  |  | Students providing energy |
|  | Contains chlorophyll that is used to make food for the cell |  |
|  |  | Mr. Batchelor (our principal) |
|  | Forms outer boundary of cell; only allows certain materials to move into or out of the cell |  |
| Nuclear Membrane |  |  |

Remember, an **analogy** is something used to help you remember key concepts of a lesson by having you compare it to something familiar. Will this analogy between the cell and our school help you remember?

Parts of a Cell (cont.)

Now, I would like you to come up with your own analogy for the cell and its organelles. Think about a factory, mall, city, or anything else that has these particular functions. I have started the chart for you:

What analogy are you going to use? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Organelle | Function | Your own analogy |
| Cell Membrane |  |  |
| Cytoplasm |  |  |
| Nucleus |  |  |
| Nuclear Membrane |  |  |
| Mitochondria |  |  |
| Vacuole |  |  |
| Cell Wall |  |  |
| Chloroplast |  |  |