All living organisms are made up of cells.

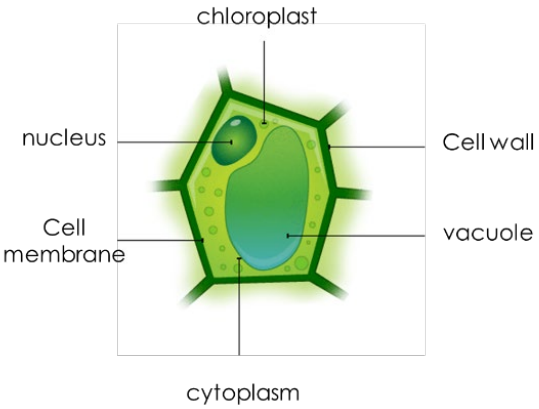
All living organisms are made up of cells, the smallest structural (how it looks) and functional (how it works) unit. Organisms can be **Unicellular** – consisting of one independent cell, or be **multicellular** – organised networks of cells with different functions and structures; humans have over 100 trillion cells.

The structure of a typical plant cell includes a cell membrane, cytoplasm, nucleus, cell wall, vacuole, and chloroplast.

Cell Wall - Gives the cell rigidity and a more angular appearance.

Chloroplasts - The site of photosynthesis, gives the cell its characteristic green colour

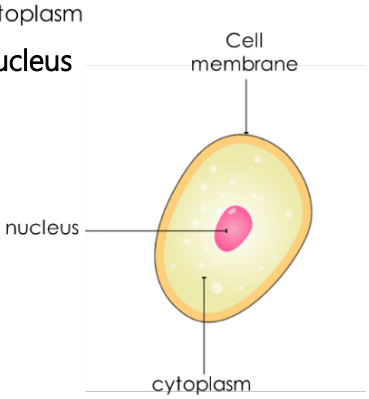
Vacuole - Assists with storage and structure



The structure of a typical animal cell includes a cell membrane, cytoplasm and nucleus

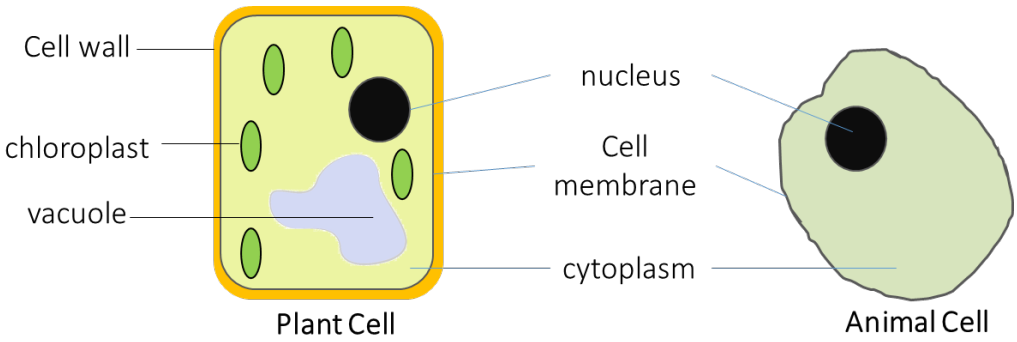
Cell membrane - Surrounds cell and controls passage of nutrients and chemicals. Flexible and allows cell to change shape.

Cytoplasm - A liquid filling the cell and containing all the chemicals the cell needs to function.



Plant and animal cells similarities and differences.

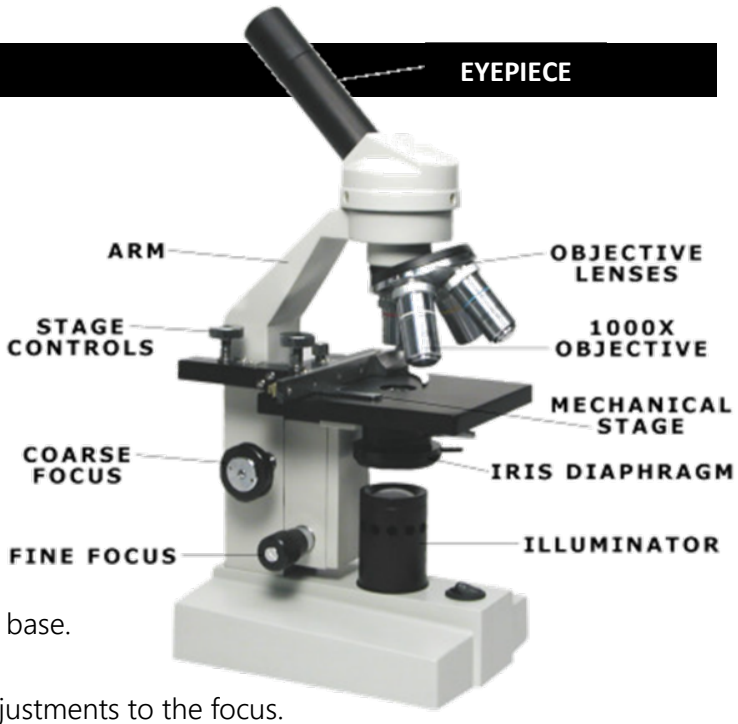
Similarities	Differences
1. BOTH cells have a 'skin', called the membrane, protecting it from the outside environment. 2. BOTH cells have a nucleus. The 'information storage' of the cell. 3. BOTH cells have Cytoplasm, a fluid that protects the inside of the cell and carries nutrients	1. ONLY Plants have a cell wall that help define the shape and give structure to the plant. 2. ONLY plant cells contains chloroplasts that helps in the plant's photosynthesis. 3. Plant cells are generally larger than animal cells. 4. Plants have a larger Vacuole.



Using a Microscope

Most cells are too small to be clearly seen by eye and require a microscope to view.

Magnification: the number of times the image is enlarged
Resolution: the clarity (how clear) and ability to see detail in the image



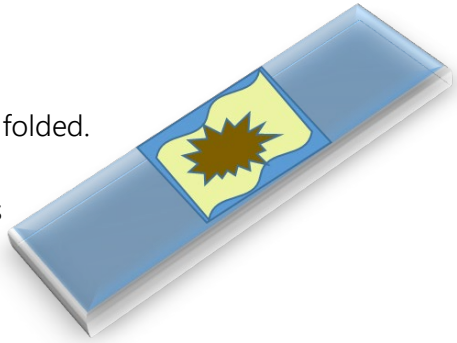
Microscope parts and function

Arm - this attaches the eyepiece and body tube to the base.
Base - this supports the microscope.
Coarse focus adjustment - a knob that makes large adjustments to the focus.
Eyepiece - where you place your eye.
Fine focus adjustment - a knob that makes small adjustments to the focus (it is often smaller than the coarse focus knob).
High-power objective - a large lens with high magnifying power.
Low-power objective - a small lens with low magnifying power.
Mirror (or illuminator) - this directs light upwards onto the slide.
Stage - the platform on which a slide is placed.

Using a microscope safely

1. Make sure the lowest power objective lens (e.g. 4x) is clicked into position.
2. Place the microscope slide on the stage and fasten it with the stage clips.
3. Look at the objective lens and the stage **from the side** and turn the **course focus knob** so the stage moves upward. Move it up as far as it will go without letting the objective touch the coverslip.
4. Look through the eyepiece and move the **course focus knob down** until the image comes into focus.
5. Adjust the mirror for the greatest amount of light.
6. Use the **fine focus knob** for the clearest image
7. When you have a clear image of your sample with the lowest power objective, you can change to the next objective lenses. You might need to readjust the sample into focus
8. When finished, lower the stage, click the low power lens into position and remove the slide

Making an onion cell slide

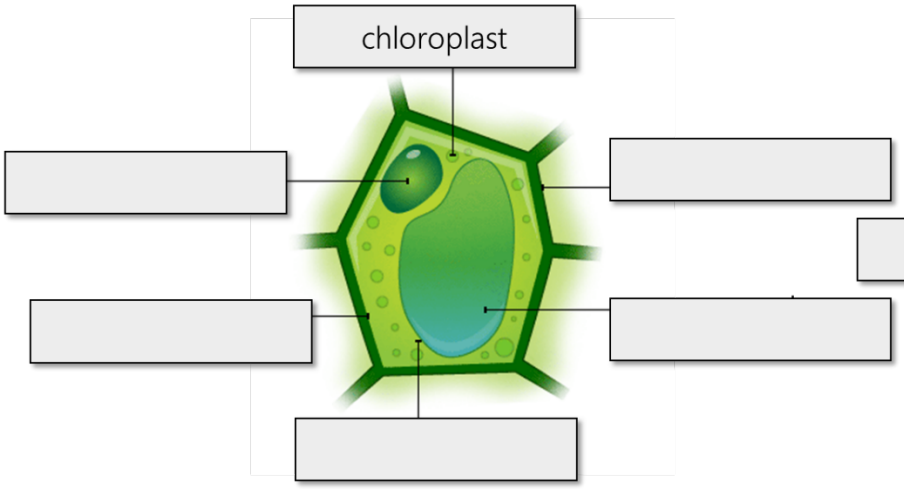


1. Collect onion, slide and cover slip, lamp and microscope.
2. Peel the epidermal cells (skin between layers) from the onion tissue.
3. Place the cell sample on your slide – spread it out and make sure it is not folded.
4. Add 2 drops of iodine (or other stain) to the onion slide.
5. Lower cover slip onto the slide one side at a time so there are no bubbles
6. Focus under the microscope – remember to start with low power!!
7. Draw 2-3 cells about 10 lines big into your books.
8. Return used slides and slips to the ice cream container with disinfectant.

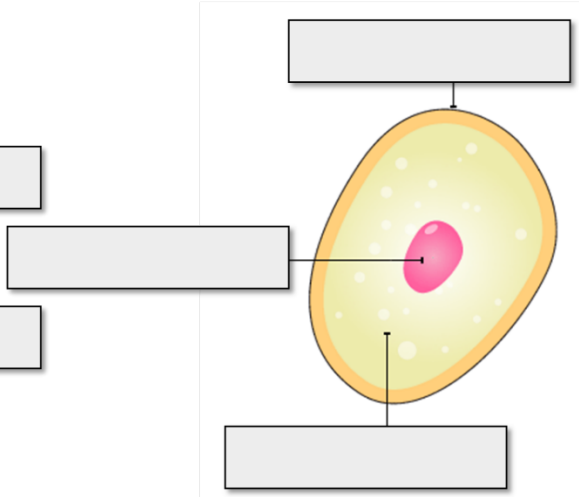
1. Label the following diagrams of cells using the word bank (some words used more than once)

cell membrane	*cell wall*	*nucleus*	*cytoplasm*	*vacuole*

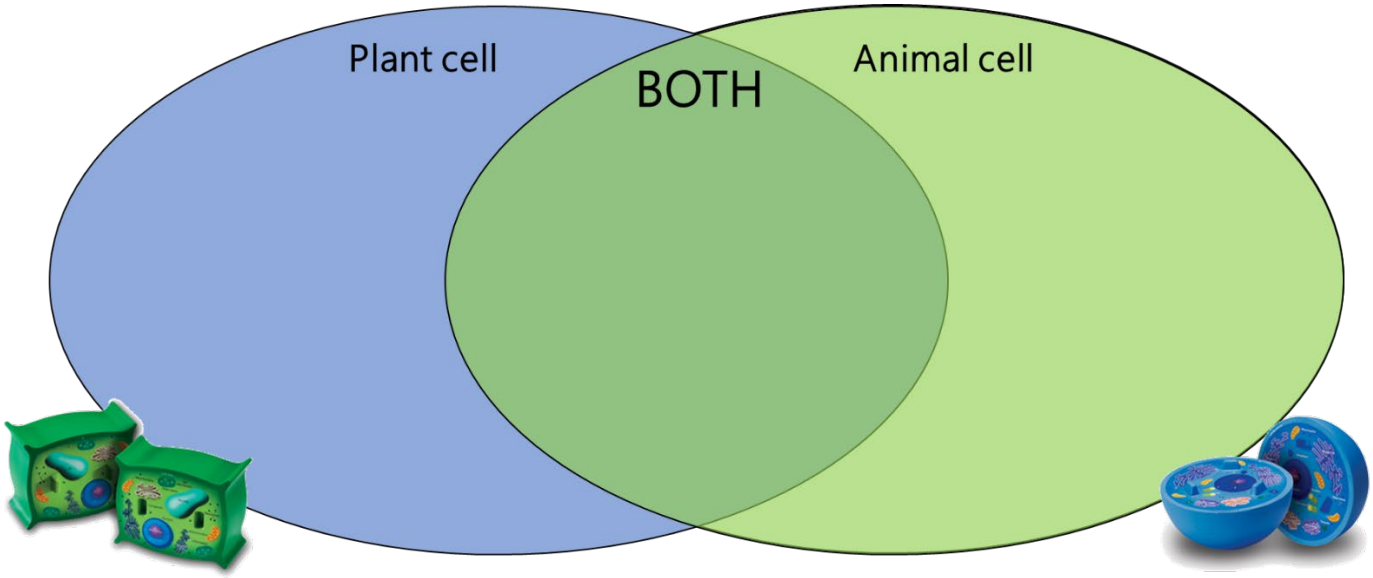
Plant Cell



Animal Cell



2. Complete the Venn diagram for the similarities and differences between plant and animal cells

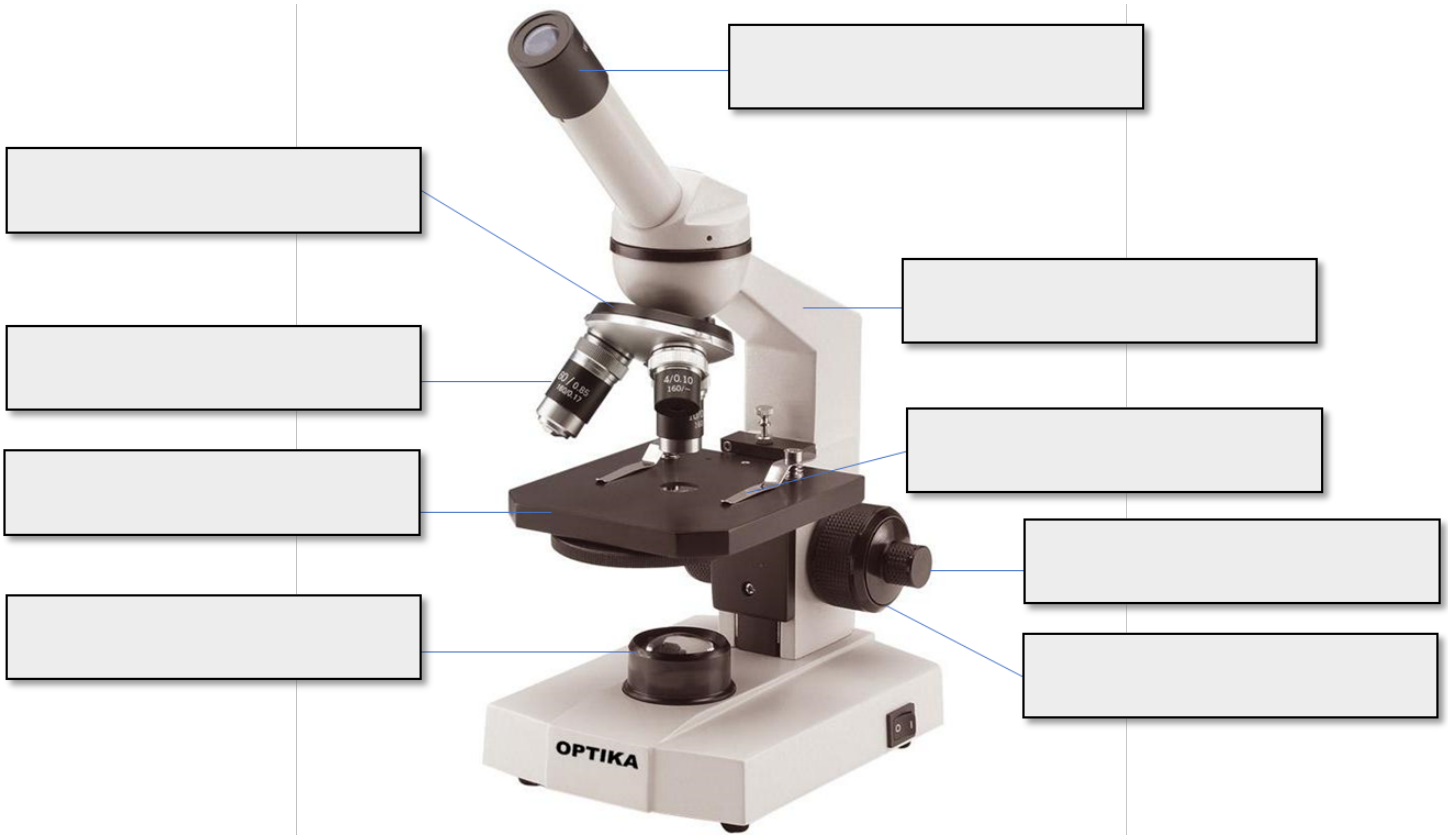


3. Give the function for the following organelles (parts) of the cell

Part	Function
cell membrane	
cell wall	
chloroplast	

4. Label the diagram of the microscope using the word bank

arm	*rotating nosepiece*	*eyepiece lens*	*course focus knob*	*fine focus knob*
illuminator/light	*stage*	*clip*	*objective lens*	



5. Write down the letter for the **CORRECT order** of the steps to prepare an onion cell slide by placing the correct letter in the box below

Letter	Scrambled Steps
Y	Peel the epidermal cells (skin between layers) from the onion tissue.
S	Draw 2-3 cells about 10 lines big into your books.
P	Lower cover slip onto the slide one side at a time so there are no bubbles
A	Use the fine focus knob to produce a clear image
M	Return used slides and slips to the ice cream container with disinfectant.
T	Place the cell sample on your slide – spread it out and make sure it is not folded.
C	Collect onion, slide and cover slip, lamp and microscope.
O	Add 2 drops of iodine (or other stain) to the onion slide.
L	Focus under the microscope with the course focus knob

Correct order
