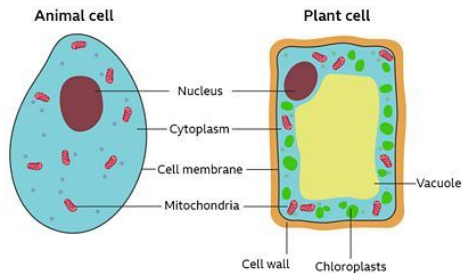


## CORE - MUST KNOW FOREVER.....



Organelle	Plant or animal cell?	Function
Nucleus	Both	Controls the cell and stores DNA.
Cytoplasm	Both	Jelly-like substance where reactions take place.
Cell membrane	Both	Controls what gets in and out of the cell.
Mitochondria	Both	Where respiration takes place to get energy.
Vacuole	Plant	Filled with cell sap (water and nutrients) to help support the cell.
Chloroplasts	Plant	Where photosynthesis takes place.
Cell wall	Plant	Made of cellulose and holds the plant cell up.

**DNA** - carries genetic information. It has all the instructions that a living organism needs to grow, reproduce and function.

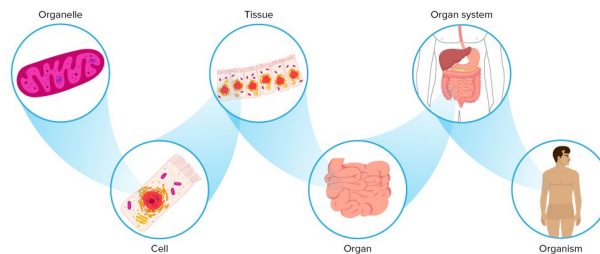
**Gene** - A section of DNA that codes for a physical trait

**Trait** - A single physical characteristic of an organism (hair colour)

**Genome** - A written down version of every gene within one organism.

## GOOD TO KNOW...

### Biological organisation



**Organelles** within cells work together to form a cell

**Cells** work together to carry out one job as a tissue.

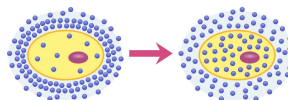
**Tissues** working together to carry out the same job form an organ

**Organs** working together to carry out the same job form an organ system

**Organ systems** work together to create a living organism.

**Organelles** → Liver Cells → Liver Tissue → Liver → Digestive System → Human

### DIFFUSION



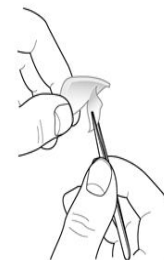
Diffusion is where chemicals move from a high concentration to low concentration across a semi-permeable membrane (cell membrane). The chemical will spread out till there is an even number inside the cell and outside.

It is used by all living organisms to allow useful chemicals into a cell such as oxygen and glucose and remove unwanted or dangerous chemicals such as carbon dioxide in humans.

## HOW TO....

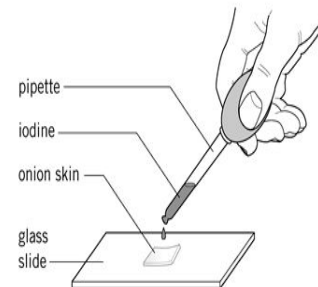
### Method

- 1 Collect a piece of onion.
- 2 Remove one of the onion layers.
- 3 Using forceps, carefully peel off the inner skin of the onion layer.



- 4 Place the onion skin onto a clean glass slide. Use your forceps to keep the onion skin flat on the glass slide.

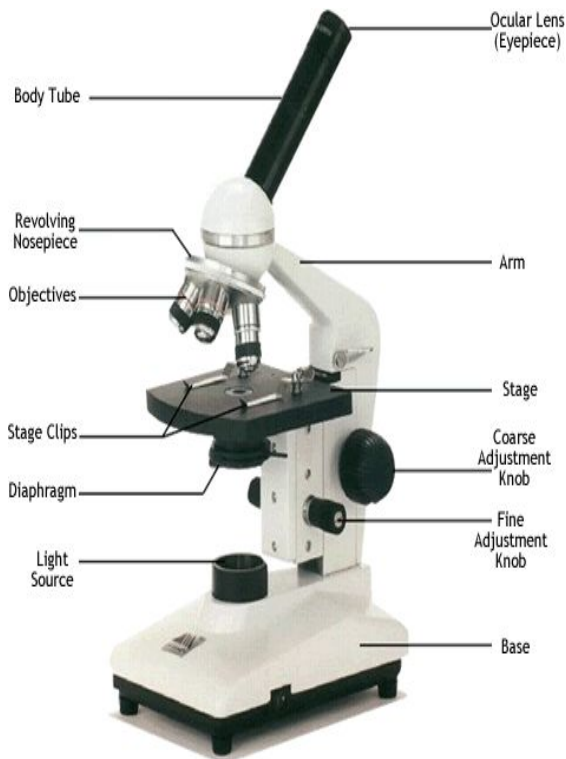
- 5 Using a pipette, add one or two drops of dilute iodine solution on top of the onion skin.



- 6 Place a coverslip on top of the skin.

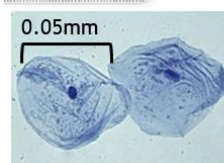
- 7 Observe using a microscope.

## CORE - MUST KNOW FOREVER.....



## GOOD TO KNOW...

Part	Function
<b>Eye-piece Lens</b>	Controls the amount of light that goes onto the microscope slide.
<b>Objective Lens</b>	This is the lens closest to your eye. It usually has a magnification of x10
<b>Stage</b>	This is used to focus the image so it is very sharp and clear.
<b>Diaphragm</b>	This is used to focus the image so that you can see it clearly.
<b>Light Base</b>	This holds the eyepiece lens above the stage.
<b>Arm</b>	There are three lenses of different strengths which can be used to magnify the image more clearly.
<b>Fine Focus Wheel</b>	This is the place where you put a microscope slide. Clips hold the slide in place
<b>Coarse Focus Wheel</b>	The light source projects light onto the microscope slide. It can be a mirror or an electric bulb.
	This is very heavy to keep the microscope from falling over



Calculate the magnification of this image.

$$\text{Magnification} = \frac{\text{Image}}{\text{Actual}}$$

## HOW TO....

### Microscope Method

1. Move the stage (the flat ledge the slide sits on) down to its lowest position.
2. Place the glass slide onto the stage. Be careful pushing it under the clips that the cover slide doesn't move or crack.
3. Select the lowest power objective lens.
4. Turn the coarse focus knob slowly until you are able to see the cells.
5. Turn the fine focus knob slowly until the cells are in focus and you can see them clearly.
6. Repeat steps 1-5 using the higher power magnification to see the cells in more detail.



## CORE - MUST KNOW FOREVER.....

## GOOD TO KNOW...

## HOW TO....

Pieces of lab equipment are drawn like this.

Name	Diagram	Name	Diagram
Test tube		Tripod	
Boiling tube		Gauze	
		Bunsen burner	
Beaker		Evaporating basin	
Conical flask (i.e. cone-shaped)		Filter funnel (with paper)	
Measuring cylinder			

### Scientific Variables

- Dependent** - What we choose to measure in an experiment
- Independent** - What we choose to change in an experiment
- Control** - What we choose to keep the same in an experiment to make it a fair test

### Key Words

- Hypothesis** - Question you are trying to answer during an experiment
- Conclude** - What did you learn from your experiment
- Evaluate** - What went well, even better if for the experiment
- Accurate/accuracy** - How close your results are to the correct answer
- Repeatable** - An experiment that can be done again by different scientists who still get the same result as you.
- Anomaly** - A result that does not fit the trend or pattern
- Continuous** - A value that can be found on a number line
- Categorical** - Numbers or words that fit into a group/category

### Analysing Graphs

**X-axis** is the independent variable  
**Y-axis** is the dependent variable

**Continuous data** = line graph  
**Categorical data** = bar graph and pie charts

**Line of best fit** (line graph only)

**Directly and indirectly proportional**

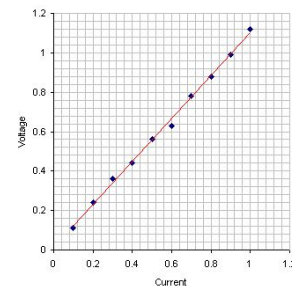
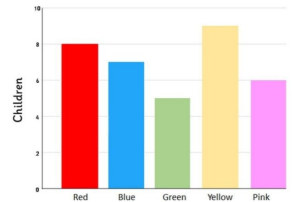
### Writing a method

- Use bullet points
- Use names of specific equipment used
- Name every chemical
- Give the volume/mass or concentration of chemicals
- Include the variables
- Explain the experiment step by step so someone else can carry it out from your instructions
- Repeat your experiment 3 times
- Collect your data

### Success when drawing graphs

1. Use pencil and ruler. Draw Y and X axis.
2. Label the axis and include the (units).
3. Every 1 cm, draw a little mark on each of the axis.
4. For each mark, add a number going up in 1s, 2s, 5s or 10 s. Example: 10, 20, 30...
5. Plot your results accurately.
6. For a line graph use a ruler to draw 1 line of best fit.

For a bar graph, label each bar underneath it.



### Writing a conclusion

- Describe the trend in your graph
  - What changes are there?
  - Use evidence by including data
- Explain your data
- Connect your results to the science you already know

### Converting units

- On the right is how to convert your units.
1. Start with your starting unit,
  2. Pick which end unit
  3. Do what the arrow says

