

Name:

Form:

Teacher:

# Year 7 Science

# Home Learning Book



# The Coleshill School Science Year 7 Log Book

The logbook is designed to help you to keep a record of the science work you do each topic.

It will help you revise before each test and it helps your teacher to see what you have or have not understood.

It is important that you complete it for EVERY topic and you MUST ask a question at the end.

There is a section for you to record how well you do on your science investigations throughout the year. This will be filled with your teacher.

It has a useful section that shows you some common laboratory equipment and an additional section that explains how to revise for tests and exams. They are only useful if you read them!

Your teacher will take in the booklet every half term and give you a mark. There will be an award for the best log book every half term.

## Homework:

My homework nights are ..... and .....

My teacher wants me to hand my work in on .....  
and ..... in .....

# Introduction

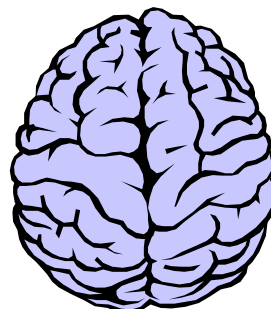
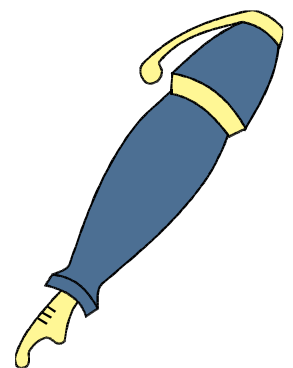
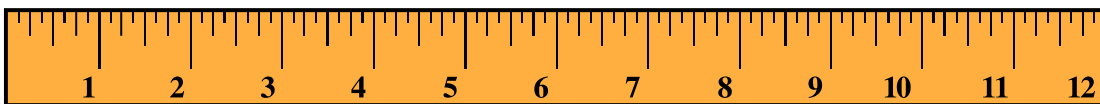
This is your scientist's logbook for **Year 7**. You are expected to complete all the sections each week to the best of your ability. It is important to keep it up to date because you will be able to use it to revise from and you can ask the teacher about things you would like to know more about or things that you aren't sure about.

## Science Check List

There are five things that you must bring to every science lesson.

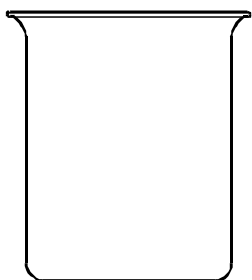
Use the picture clues to help you fill in the missing words.

1. I must bring a .....to write with.
2. I must bring my .....to write in.
3. I must bring a .....to underline titles.
4. I must bring a.....to draw diagrams with.
5. I must bring my .....to think with.

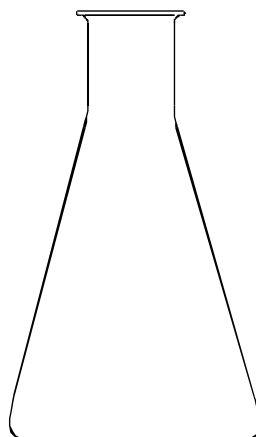


The next section shows you the common pieces of laboratory equipment we expect you to be familiar with before the end of the year - take a look now and see how many you can name already.

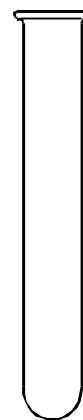
## Common Laboratory Equipment



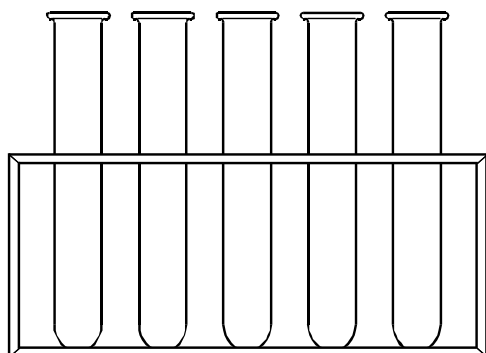
Beaker



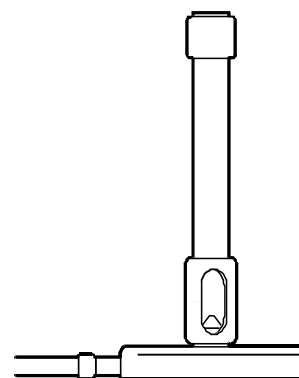
Conical Flask



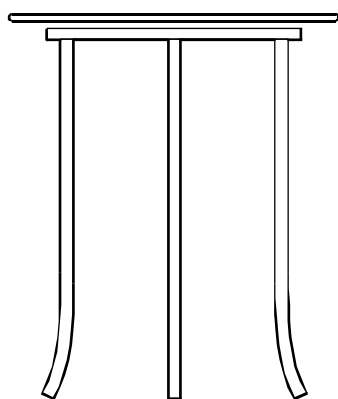
Boiling Tube



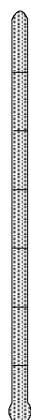
Test tubes & test tube rack



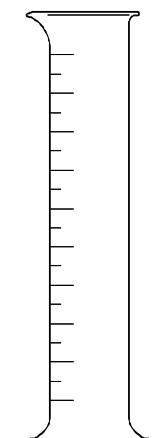
Bunsen Burner



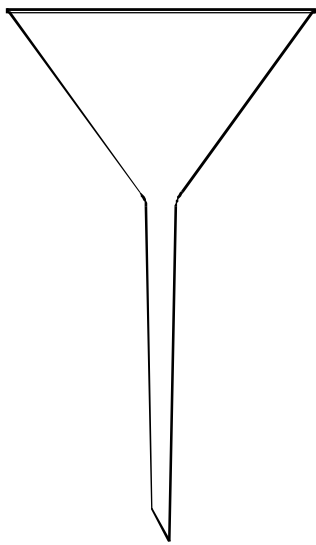
Tripod & Gauze



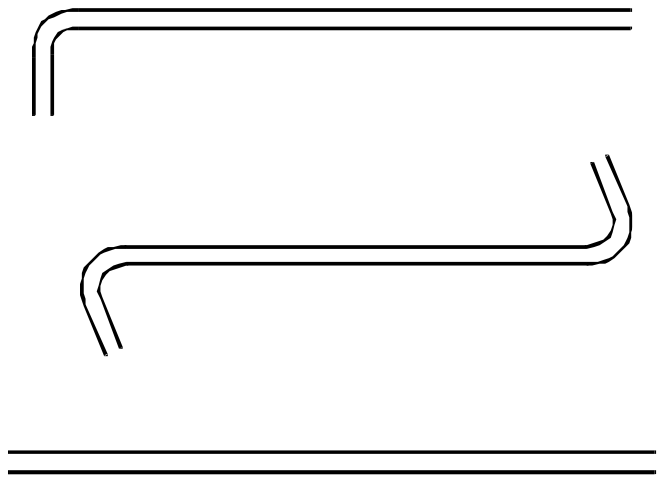
Thermometer



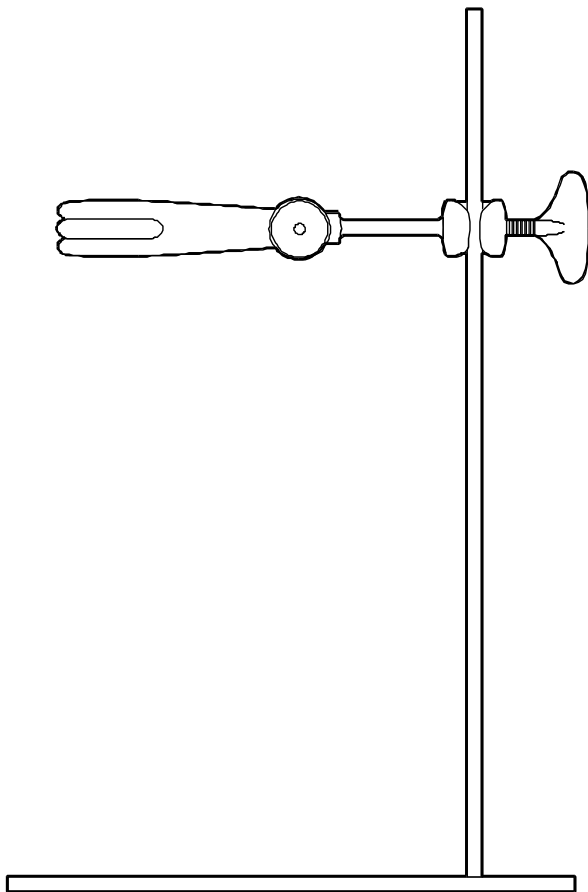
Measuring cylinder



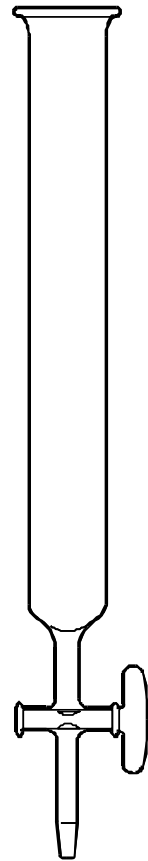
Funnel



Collection & Delivery tubes



Retort Stand & Clamp



Burette

## Science Year 7 Knowledge Organiser – P1 Physics – Forces

**Overview of topic:** This unit explores the concept of forces which are pushed and pulled. Forces are split into contact and non-contact forces which can be balanced or unbalanced. Using the idea that arrows denote the size and the direction in which the forces are acting. When the resultant force on an object is 0 N, the object is in equilibrium and will move at a constant speed in a straight line. Force can be used to calculate the pressure that particles exert on a surface. This will help pupils to understand that forces that acting on object determines the motion of the object. Complete calculations for the speed objects travel and interpret graphs to explain the motion of objects.

### Key content/ ideas/ concepts

### Keywords/ Glossary

**Force:** Forces are pushes or pulls that act on objects

**Drag:** The force acting on an object moving through the air or water that causes it to slow down.

**Friction:** The force that resists movement because of contact between surfaces.

**Balanced forces:** When opposing forces on an object are equal.

**Unbalanced force:** When opposing forces on an object are unequal.

**Resultant forces:** The overall result of the forces on an object – It is represented as a number/arrow

**Newtons (N):** The unit for forces.

**Equilibrium:** When forces are balanced.

**Acceleration:** Object's speed is increasing

**Deceleration:** Object is slowing down

A **resultant force** is the combined effect of opposite forces:

Here the resultant force is 50 N, so therefore if the object is moving 50 N to the right.



A **resultant force** is the combined effect of opposite forces:

Here the resultant force is 0 N, so therefore if the object is stationary then it will remain stationary. If the object is moving then it will travel at constant speed.

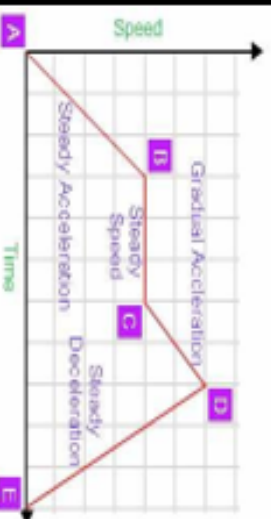


The resultant force is 0 N

	Stationary object	Moving objects
Balanced forces or no force	Stays still	Moves at a constant speed
Unbalanced forces	Moves in the direction of the resultant force	Accelerates or decelerates

The equation to calculate speed is:  $\text{Speed} = \text{distance}/\text{time} (S = D/T)$

Speed distance graphs are used to interpret a journey. The graph describes/explains the journey of an object.



Between A-B The object is accelerating.

Between B-C The object is travelling at constant speed.

Between C-D the acceleration is gradual.

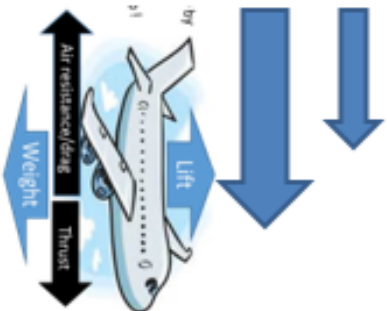
Between D-E The object is decelerating at a steady speed

### Measured using a Newtonmeter

The units of force are Newtons (N)  
Named after Isaac Newton who proposed 3 laws of motion



Thicker or longer arrows show larger forces on force diagrams.



### Wider reading

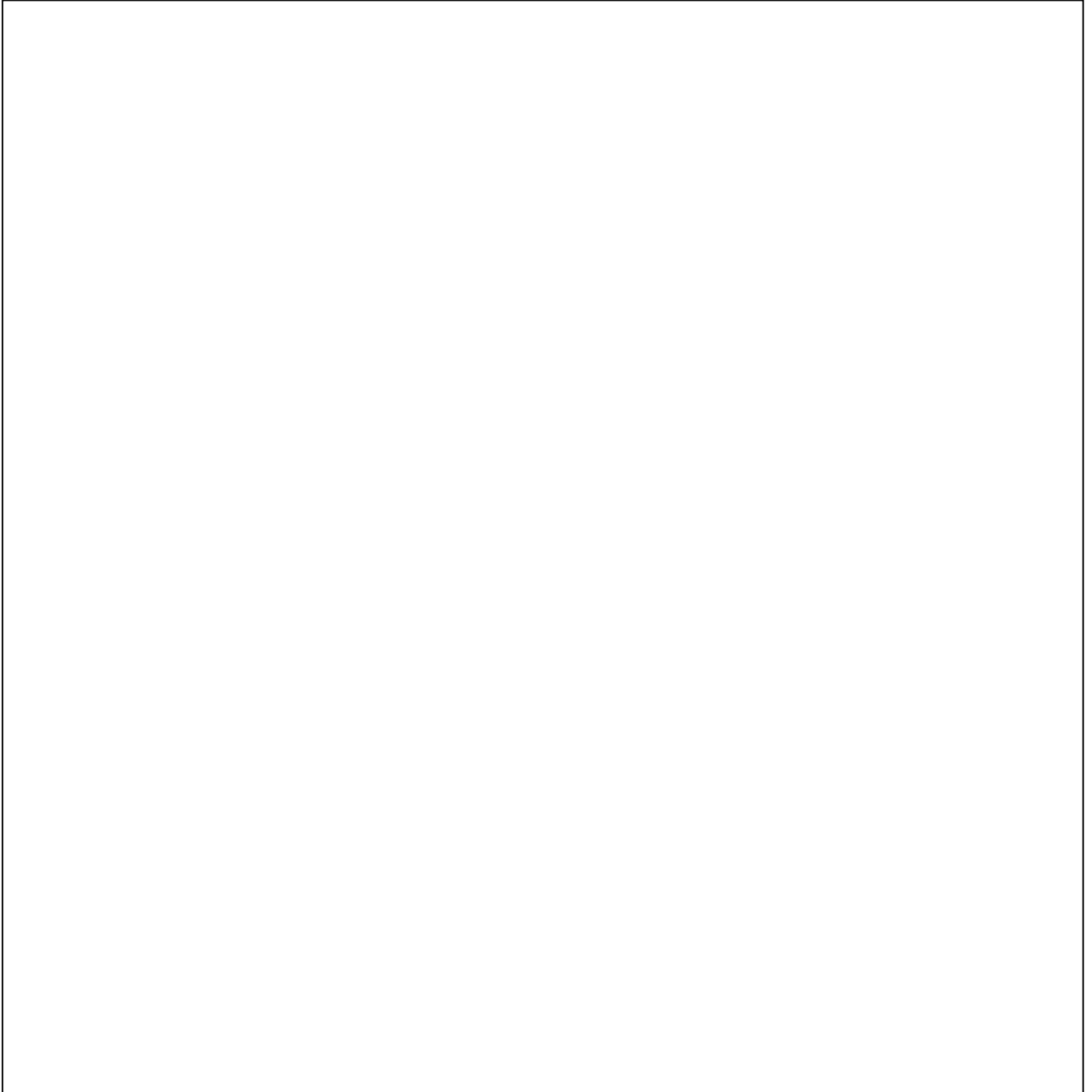
Newton's discovery of forces. NASA and the recent discovery of a multi-exoplanet system. The 21<sup>st</sup> century space race by Space X, Blue Horizon and Virgin Galactic

## Science Year 7 Knowledge Organiser – P1 Physics – Forces

KNOW IT	GRASP IT	THINK IT
1. What is the difference between a contact and non-contact force?	1. What happens to an object if the forces are unbalanced?	1. Explain why top speed and average speed is different over a journey?
2. Give some examples of contact and non-contact forces and describe their effects on objects?	2. Describe the difference between the three main variables?	2. Draw a diagram showing the forces acting on an aeroplane, Explain the effect of these forces?
3. Describe what a newton meter is used for?	3. Explain what a resultant force is?	3. Explain what a horizontal line, straight upward-sloping line means?
4. Name the forces?	4. Describe the difference between weight and mass and identify the units for each?	4. Explain why a car speeds up when the driver pushes the accelerator pedal.
5. Describe the effect of friction on objects?	5. What would the resultant force be on an object if is not moving?	5. Explain in terms of forces why a car is accelerating?
6. Describe the difference between balanced and unbalanced forces?	6. What is the equation for speed?	6. Explain the forces that act on a parachutist as he jumps out of an aeroplane?
7. Describe how forces affect the effect of objects?	7. Calculate the distance travelled by an object if the speed is 600m/s and the time taken is 10 seconds?	7. How many newton's are in 2.3kN, 345kN??
8. What is the resultant force is the force to the left is 400N and the force to the right is 700 N?	8. Draw force diagram to show that the force is balanced.	8. Draw force diagrams and calculate the size and direction of the resultant force for the following situation? A boat has a force of 500N from the wind pushing it forward and the water resistance is 200N.
9. Describe what happens to an object is the force is unbalanced?	9. Draw a graph to describe your journey to school?	9. Compare gravity with other forces?
10. Describe what happens to an object if the forces are balanced and the object is stationary and moving?	10. Explain how gravity affects the weight of the object?	10. Explain the relationship between gravitational field and weight of an object?
Total score	Total score	Total score

# Scientists Log Book

Forces REVISION Spider Diagrams

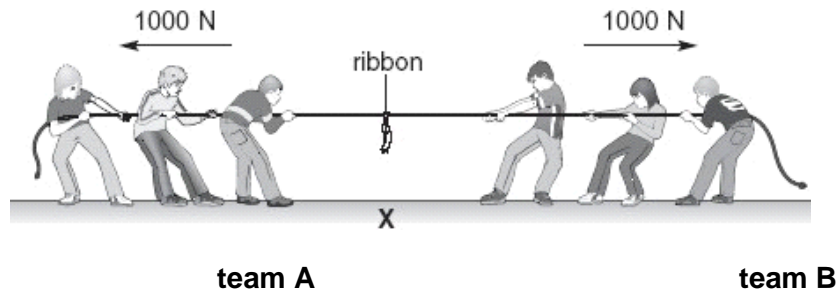




**Q1** The drawings in parts (a), (b) and (c) show two teams of pupils in a tug-of-war.

There is a ribbon tied to the middle of the rope.

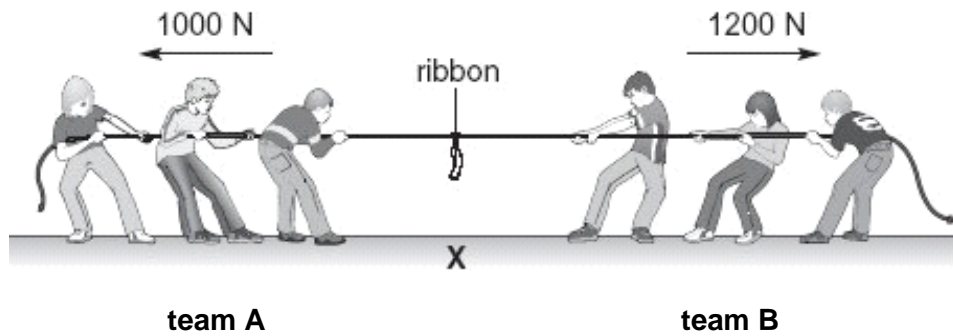
(a) The sizes and directions of the forces of each team are shown.



The ribbon stays above point X on the ground. Give the reason for this.

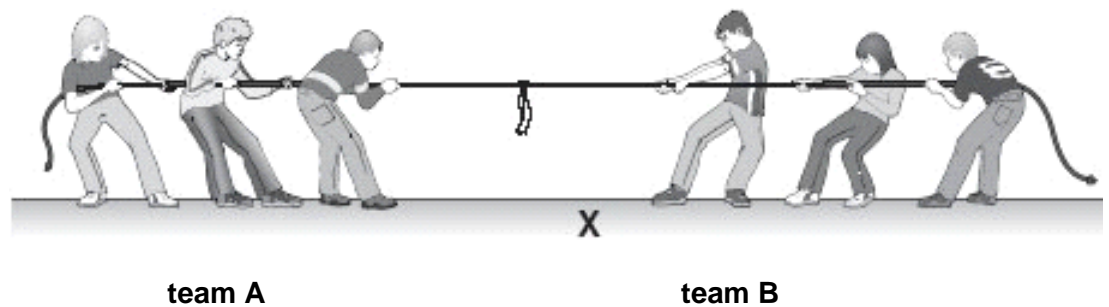
.....  
 .....1 mark

(b) The teams then pull with the forces shown below.



Draw an arrow on the rope to show the direction in which the ribbon will move. 1 mark

(c) Later, the ribbon was to the left of point X as shown below.

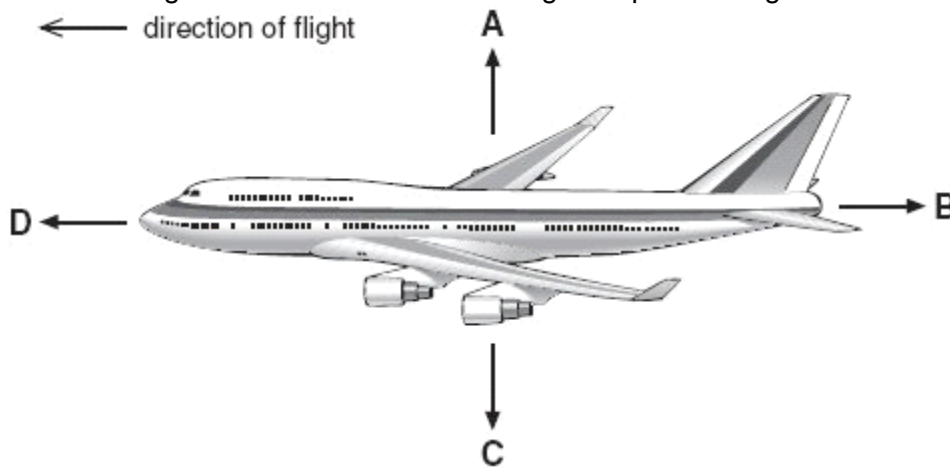


Why did the ribbon move towards the left?

.....  
 .....1 mark

**Q2.**

The diagram shows four forces acting on a plane in flight.



(a) Which arrow represents air resistance? Give the letter..... 1 mark

(b) (i) When the plane is flying at a constant height, which **two** forces must be balanced?

Give the letters ..... and ..... 1 mark

(ii) When the plane is flying at a constant speed in the direction shown, which **two** forces must be balanced? Give the letters.

..... and ..... 1 mark

(c) (i) Just before take-off, the plane is speeding up along the ground.

Which statement is true? Tick the correct box. 1 mark

Force B is zero.

Force D is equal to force B.

Force B is greater than force D.

Force D is greater than force B.

(ii) Which statement is true about the plane just as it leaves the ground? Tick the correct box.

1 mark

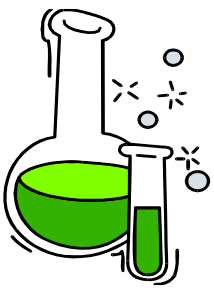
Force C is zero.

Force A is equal to force C.

Force C is greater than force A.

Force A is greater than force C.

maximum 5 marks



# Scientists Log Book

## FORCES

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:



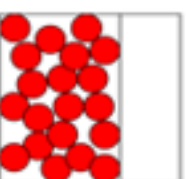
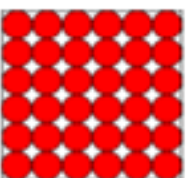
## Science Year 7 Knowledge Organiser: C1 Particles

**Overview of topic:** You will know the properties of solids, liquids and gases, describe and explain them changing state. You will also describe diffusion in terms of particles and explain what can effect diffusion. You will be able to state what gas pressure is and describe the particles in a gas to explain the changes in gas pressure

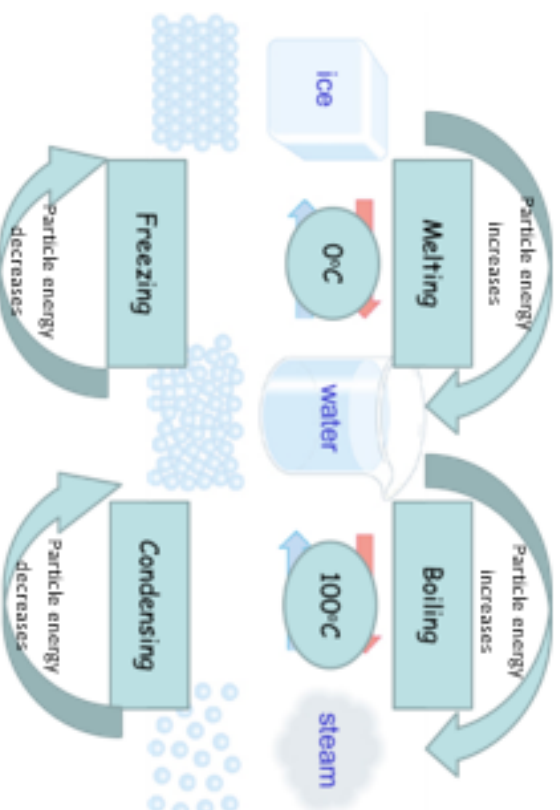
### Key content/ ideas/ concepts

#### The 3 states of matter

- |   |  |   |
|---|--|---|
| <p><b>SOLID</b></p> <ul style="list-style-type: none"> <li>Fixed shape</li> <li>Fixed volume</li> <li>Cannot be compressed</li> </ul> | <p><b>LIQUID</b></p> <ul style="list-style-type: none"> <li>Can flow</li> <li>Fixed volume</li> <li>Take the shape of the container</li> <li>Cannot be compressed</li> </ul> | <p><b>GAS</b></p> <ul style="list-style-type: none"> <li>Take the shape of the container</li> <li>Can be compressed</li> <li>Hard to store</li> </ul> |
|---|--|---|



#### Changing state and energy changes



### Keywords/ Glossary

**Melting**= A solid turning into a liquid.

**Evaporation**= A liquid turning into a gas.

**Freezing** = a liquid turning into a solid.

**Condensing** = a gas turning into liquid.

**Boiling** = the change of state from a liquid to a gas that occurs when bubbles in the substance in its gas state form throughout the liquid.

**Sublimation** = a solid turning into a gas.

**Atom** = the basic unit of matter.

**Elements** = Substances that all other materials are made up of, made of one type of atom.

**Molecule** =Two or more atoms chemically joined together.

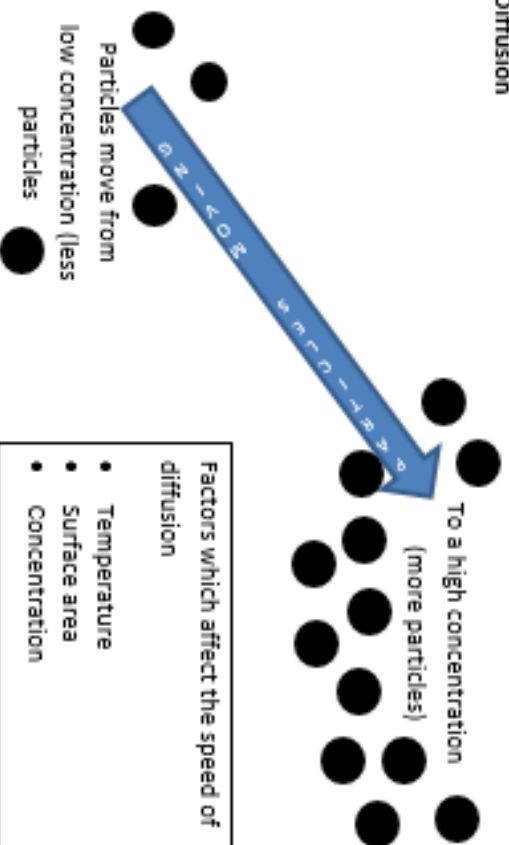
**Compound** = Two or more different atoms chemically joined together.

**Gas Pressure** = The force that a gas exerts on a container.

#### Wider reading

[http://www.bbc.co.uk/schools/gcse/bitesize/science/aqa\\_pre\\_2011/rocks/atomsrev1.shtml](http://www.bbc.co.uk/schools/gcse/bitesize/science/aqa_pre_2011/rocks/atomsrev1.shtml)

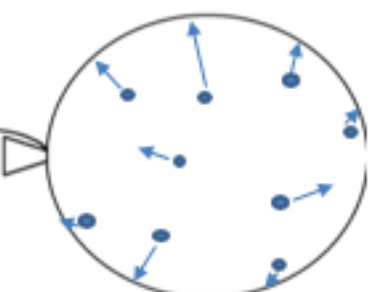
#### Diffusion



Factors which affect the speed of diffusion

- Temperature
- Surface area
- Concentration

#### Gas pressure



The gas particles have lots of energy and can move freely. These push against the sides of the balloon

## Science Year 7 Knowledge Organiser: C1 Particles

KNOW IT	GRASP IT	THINK IT
1. What is an atom?	1. Describe the arrangement of particles in a solid	1. Explain whether you think slime is a solid or a liquid
2. What is an element?	2. Describe the arrangement of particles in a liquid	2. Explain how increasing the number of particles in a container increases the pressure
3. Identify the difference between a molecule and a compound.	3. Describe the arrangement of particles in a gas	3. Explain why higher temperature increases the rate of diffusion
4. Draw a model of a solid	4. Describe the movement of particles in a solid	4. What is the difference between evaporation and boiling
5. Draw a model of a liquid	5. Describe the movement of particles in a liquid	5. Research three examples of substances that sublime
6. Draw a model of a gas	6. Describe the movement of particles in a gas	6. Explain why particles in gaseous state diffuse quicker than those in a liquid state
7. Identify the name of the process when a solid turns to a liquid	7. Explain how gases exert pressure	7. Explain why placing an empty bottle with the lid on in a freezer make it collapse?
8. Identify the name of the process when a gas turns to a liquid	8. Describe how particles move via diffusion	8. Explain how pressure increases with an increase in temperature
9. Identify the name of the process when a liquid turns to a gas	9. Explain how particles change state from solid to liquid with reference to energy	9. Explain why a balloon increases in size when you blow more air into it.
10. Identify the name of the process when a solid turns to a gas	10. Explain how particles change state from gas to liquid with reference to energy	10. Explain why race car technicians put a lower air pressure into their tyres before a race
Total score	Total score	Total score

# Scientists Log Book

## Particles REVISION Spider Diagrams

A large, empty rectangular box with a black border, intended for drawing spider diagrams.



**Q1.** Solids, liquids and gases have different properties and different uses. Some of these are described in the table.

Tick either **one** or **two** boxes in each row to show whether a solid, liquid or gas matches the description in that row.

property or use	solid	liquid	gas
it is used to build rigid or stiff structures			
it flows easily through a pipe or tube			
it can be squeezed into a much smaller volume			

4 marks

**Q2.** This question is about four chemical elements.

(a) The melting points and boiling points of the four elements are shown in the table. Complete the table to give the physical state, **solid**, **liquid** or **gas**, of each element at room temperature, 21°C. 4 marks

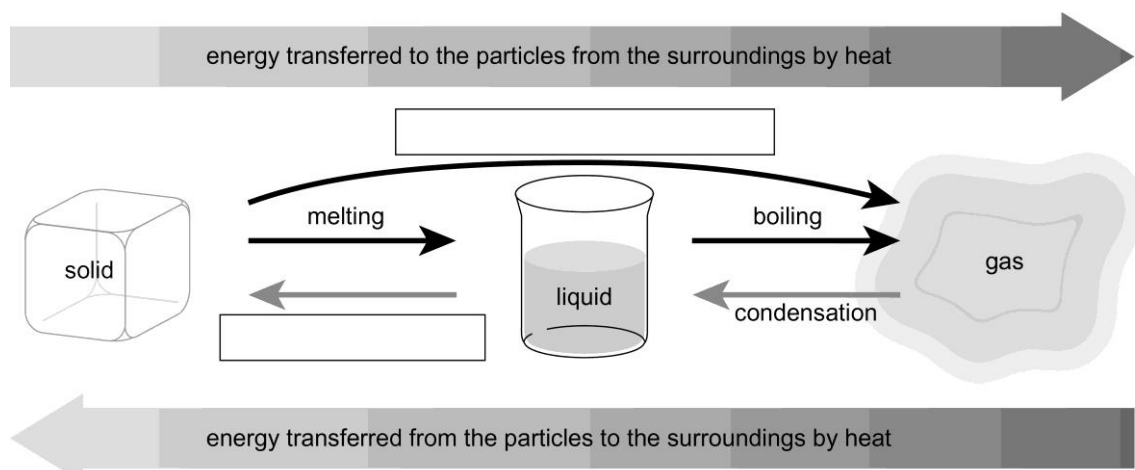
element	melting point in °C	boiling point in °C	physical state at room temperature, 21°C
bromine	-7	59	
chlorine	-101	-34	
fluorine	-220	-188	
iodine	114	184	

(b) Is bromine a **solid**, a **liquid** or a **gas** when the arrangement of particles is:

- (i) far apart and random?  
.....1 mark
- (ii) close together but random?  
.....1 mark
- (iii) close together in a regular pattern?  
.....1 mark

**Q3.** Complete the diagram

2 marks



**Q4.** Amy sprayed some air freshener in one corner of the room. Jack was sat in the opposite corner of the room.

Use the words below to fill in the gaps to explain how Jack could smell the air freshener from across the room. You may use the words more than once.

**diffusion**

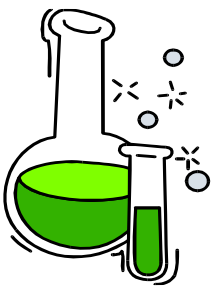
**low**

**particles**

**high**

In the corner where Amy was standing there was a \_\_\_\_\_ concentration of air freshener particles. In the corner where Jack was sitting there was a \_\_\_\_\_ concentration of air freshener \_\_\_\_\_. The air freshener moved from an area of \_\_\_\_\_ concentration to \_\_\_\_\_ concentration in a process called \_\_\_\_\_.





# Scientists Log Book

## PARTICLES

What we did in science this week

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would like to ask



# Science Year 7 Knowledge Organiser: B1 Cells and Organisation

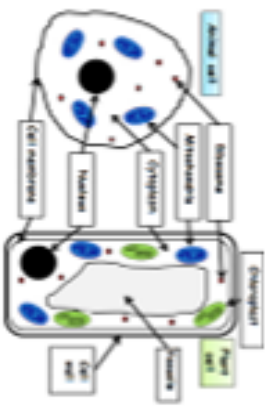
## Overview of topic:

Cells are the building blocks of all living organisms. This unit explores plant cells, animal cells and even unicellular organisms which are organisms made of only one cell. You will also learn about how substances get into and out of these cells and the functions of their different parts (organelles).

## Key content/ ideas/ concepts

## Keywords/ Glossary

### Plant and animal cell structure:



### Using a microscope

Cells are very small and can only be seen using a microscope.

A light microscope uses a lens to produce a magnified image of an object.

Total magnification = eyepiece lens magnification x objective lens magnification

To make a slide:

Take a sample (e.g. onion cells) and place it onto a glass slide. Add some stain (e.g. iodine) and place a cover slip on top. Put the slide onto the stage and use the focusing knobs to view the sample.

### Specialised cells

All young cells start of exactly the same—as stem cells. When they grow, stem cells change their structure to carry out a certain job this is called cell specialisation.

Nerve cells - are long to carry electrical impulses.

Muscle cells – can contract to create movement.

Sperm cells - have tails to swim and the head contains male genetic material. (DNA)

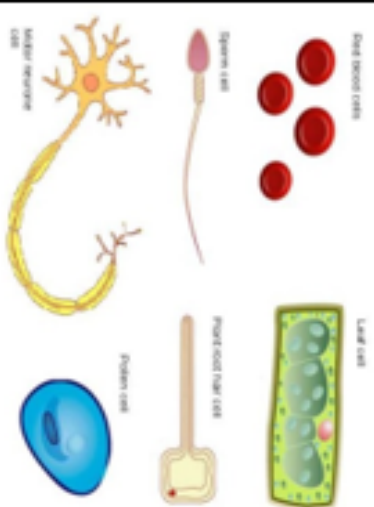
Egg cells - contain female genetic material.

Root hair cells - have a large surface area for diffusion and thin cell walls.

Epithelial cells - have cilia to waft substances.

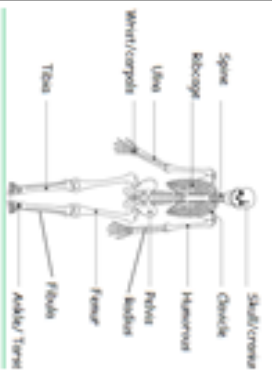
Palisade cells - have lots of chloroplasts for photosynthesis.

Red blood cell - has haemoglobin to carry oxygen and no nucleus.



### The skeletal system

The functions of the skeletal system are movement, support and protection.



### Joints:

Joints occur when 2 or more bones join together.

Hinge joint – for movement backwards and forwards.

Ball and socket joints – for movement in all directions

Fixed joints – Do not move at all

Cell- The building blocks of living organisms

Tissue- Groups of similar cells working together eg muscles and bones

Organ- A group of different tissues that work together eg the heart

Organ system- A group of organs that work together eg the digestive system

Cell membrane- Control what comes in and out of the cell.

Nucleus- Contains DNA and controls the cell

Cytoplasm- Jelly like substance where reactions take place.

Mitochondria- Where respiration takes place and energy is released.

Ribosomes- Where proteins are made

Cell wall- Plant cell only. Made of cellulose to support the cell

Vacuole- plant cell only Contains cell sap and helps keep the cell firm.

Chloroplasts- Plant cell only. Absorbs light and where photosynthesis occurs.

Diffusion- The movement of particles from an area of high concentration, to low concentration.

Unicellular organisms-- Organisms made of only one cell eg bacteria.

### Wider reading:

[http://www.bbc.co.uk/bitesize/ks3/science/organisms\\_behaviour\\_health/cell\\_systems/revision/1/](http://www.bbc.co.uk/bitesize/ks3/science/organisms_behaviour_health/cell_systems/revision/1/)

Diffusion is the movement of particles from a high concentration to a low one. You can increase the rate of diffusion by increasing temperature, concentration and pressure.

## Science Year 7 Knowledge Organiser: B1 Cells and Organisation

Know it	Grasp it	Think it
1. Write a definition of a cell.	1. Explain how a root hair cell is adapted for its function.	1. Write a definition of a stem cell.
2. Draw a labelled diagram of an animal cell.	2. Explain how a sperm cell is adapted for its function.	2. Explain how a cell becomes specialised.
3. Which part of a cell controls what enters and leaves the cell?	3. Explain how a palisade cell is adapted for its function.	3. Explain why plant cells contain organelles that animal cells do not.
4. Describe the function of the nucleus.	4. Describe what diffusion is.	4. Write a comparison of plant cells, animal cells and bacteria cells.
5. Describe the function of the cytoplasm.	5. Explain the factors that affect the rate of diffusion.	5. Compare the light microscope and the electron microscope.
6. Describe the function of chloroplasts.	6. Describe two examples of diffusion in plants and animals.	6. Compare the processes of diffusion and active transport.
7. Describe the function of the cell wall.	7. Describe how you would view plant cells under the light microscope.	7. Explain why root hair cells do not contain chloroplasts.
8. What organelles are only found in plant cells?	8. Explain why iodine is added to your plant cell sample when viewing plant cells under the microscope.	8. Describe the function of ribosomes.
9. Write a definition of a specialised cell.	9. Write the equations for calculating magnification.	9. Explain two examples of cells which have high numbers of mitochondria.
10. Draw a labelled diagram of a root hair cell.	10. Describe what the independent, dependent and control variables are in an experiment.	10. Describe the stages of mitosis (cell division).
Total score	Total score	Total score

# Scientists Log Book

Cells and Organisation REVISION Spider Diagrams

A large, empty rectangular box with a black border, intended for drawing spider diagrams.



**Q1.** Draw lines to match the organelles with their functions:

Nucleus	Fluid-filled space that supports a plant cell
Cytoplasm	Supportive structure on the outside of a plant cell
Mitochondria	Where most of the chemical reactions take place
Cell membrane	Where protein synthesis occurs
Cell wall	Photosynthesis happens here
Vacuole	Controls the cell
Ribosomes	Respiration takes place here
Chloroplasts	Controls the movement of substances in and out of the cell

**Q2.** Write the correct part of the microscope for each definition. Choose from the words.

**objective lens                      stage                      eyepiece lens                      light**  
**arm                      focusing wheel                      stage clips**

- (a) The part you turn to produce a clear image ..... [1]
- (b) The part you look through ..... [1]
- (c) The flat surface where you put the slide ..... [1]

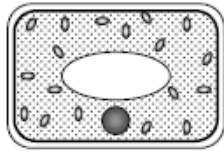
**Q3.** Complete the sentences below.

Exercise - Complete the sentences below.

- 1) A muscle is made up of many thin strands called .....
- 2) When a muscle contracts each fibre .....
- 3) Muscles are attached to bones by tough cords called .....
- 4) Muscles can only pull they cannot .....
- 5) Muscles work in ..... to move a joint in both directions.
- 6) If we wish to lift a weight our ..... contracts.
- 7) To lower the arm the biceps relaxes and the ..... contracts.

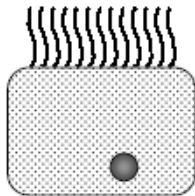
**triceps      shortens      biceps      fibres      tendons      push      pairs**

**Q4.** Join up the cells below to their correct descriptions



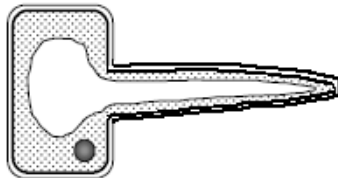
**Ciliated cell**

This cell is found lining the windpipe. Its surface is covered with tiny hairs called cilia. These waft dirt and germs up to the throat.



**Palisade cell**

This cell is found on the top side of a leaf. It contains tiny green discs called chloroplasts. These absorb sunlight in order to make food.



**Sperm cell**

It uses its tail to swim to the ovum. The head contains the nucleus which enters the ovum during fertilisation.



**Root Hair cell**

This is found on the surface of a root. Its job is to absorb water from the soil. It is long and thin with a big surface area to absorb water.



# Scientists Log Book

## CELLS AND ORGANISATION

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:



**Knowledge Organiser Coming Soon!**



Q1.

There are several forms of energy. These are :

KINETIC ENERGY - movement energy.

GRAVITATIONAL ENERGY - energy stored in objects at a height.

ELASTIC ENERGY - energy stored in stretched objects e.g. a spring.

CHEMICAL ENERGY - energy stored in chemicals e.g. fuels, batteries and food. It is released by chemical reactions.

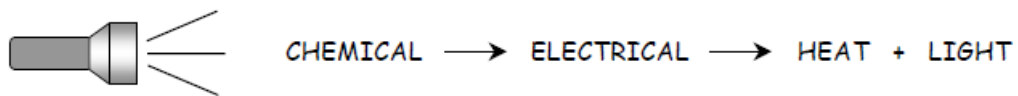
HEAT ENERGY

LIGHT ENERGY

SOUND ENERGY

ELECTRICAL ENERGY

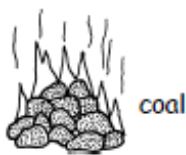
Energy is always changing from one form into another. The diagram below shows the energy changes in a torch.



Exercise - Write down the energy changes for the objects below.



1) GRAVITATIONAL → .....



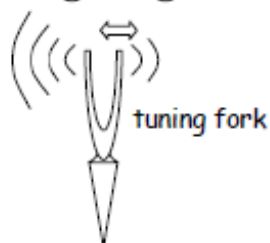
2) ..... → HEAT + .....



3) ..... → ELECTRICAL

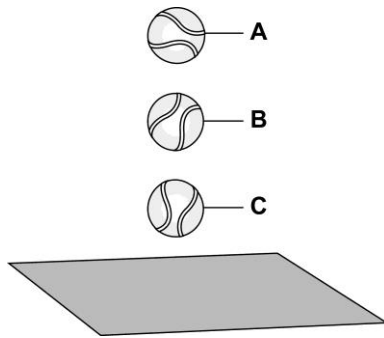


4) CHEMICAL → HEAT → .....



5) ..... → SOUND

**Q2** The diagram shows a tennis ball falling towards the floor. The ball is released from position **A**.



Complete the following sentences. Use words from the list. You do not need to use all the words from the list

**kinetic      potential      total      transfers      elastic**  
**thermal**

The gravitational \_\_\_\_\_ energy is at a maximum at point A.

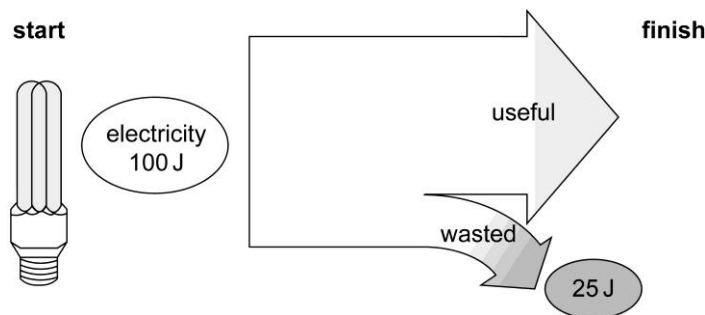
As the ball falls, energy \_\_\_\_\_ from this store to a different store.

This different energy store is due to the movement of the ball.

It is a \_\_\_\_\_ energy store.

Conservation of energy tells us that the \_\_\_\_\_ energy stored stays constant.

**Q3** The diagram shows a Sankey diagram for an energy-efficient electric light bulb.



**a.** Describe how a Sankey diagram shows the principle of conservation of energy.

---

**b.** Calculate the useful energy.

---

**c.** Describe the energy transfer that accounts for most of the wasted energy.

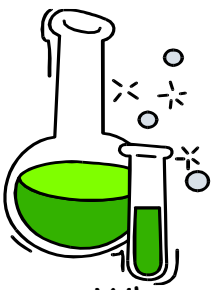
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# Scientists Log Book

## Energy REVISION Spider Diagrams

A large, empty rectangular box with a black border, intended for drawing spider diagrams.





# Scientists Log Book

## ENERGY

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

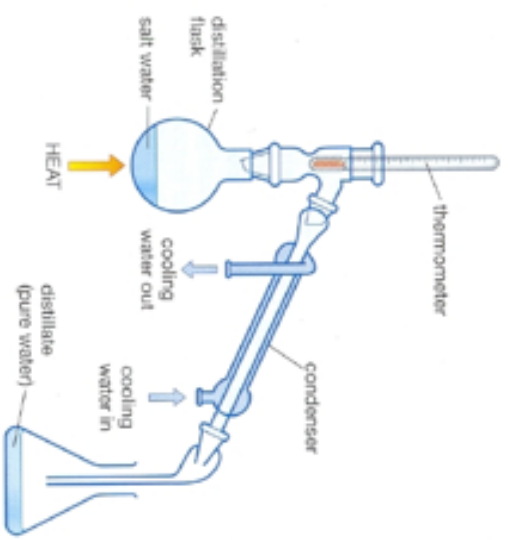
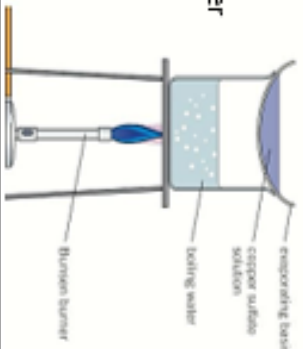
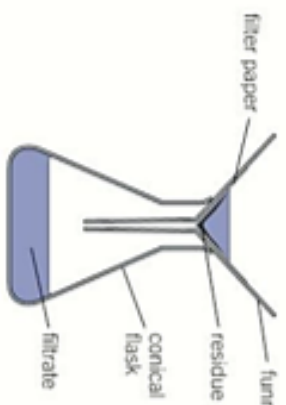
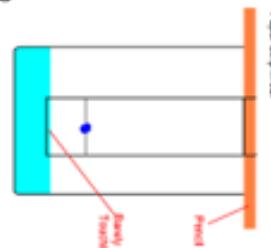
Question(s) I would still like to ask:



## Science Year 7 Knowledge Organiser: C2 Separation Techniques

**Overview of topic:** This unit explores mixtures and the way in which mixtures can be separated. You will carry out the following techniques: Filtration, crystallisation, distillation and chromatography.

### Key content/ ideas/ concepts

		Keywords/ Glossary
<p><b>Distillation:</b></p> <p>The solution is heated and the solvent boils and begins to evaporate. When the vapour travels towards a cold tube it condenses (turns back into a liquid). The pure liquid (solvent) is collected at the last stage.</p>  <p><b>Evaporation:</b></p> <p>Heat the solution using a Bunsen burner</p> <p>The liquid (solvent) will evaporate</p> <p>Leaving behind the solid solute</p> 	<p><b>Filtration:</b></p> <p>Pour the mixture into the filter.</p> <p>Insoluble material will stay in the filter paper (residue) as it is too large to pass through the filter holes. Soluble materials will pass through the small holes of the filter paper into the conical flask (the filtrate)</p>  <p><b>Chromatography:</b></p> <p>Draw a pencil line 2cm from the bottom of the paper.</p> <p>Put one dot of each pen along the line.</p> <p>Put 1cm of water into a beaker and put the filter paper in the beaker to the pencil line is above the water.</p> <p>Take the filter paper out when the water gets near to the top and leave it to dry,</p> 	<p><b>Pure</b> - A material that is composed of only one type of particle.</p> <p><b>Impure</b> - A material that is composed of more than one type of particle.</p> <p><b>Evaporation</b> - A change of state involving a liquid changing to a gas</p> <p><b>Distillation</b> - A process for separating the parts of a liquid solution. The solvent is heated and the gas is collected and cooled.</p> <p><b>Filtration</b> - The act of pouring a mixture through a mesh, in attempts to separate the components of the mixture.</p> <p><b>Mixture</b> - A material made up of at least two different pure substances.</p> <p><b>Chromatography</b> = A technique used to separate mixtures of coloured compounds.</p> <p><b>Solute</b> - a substance that dissolves in a solvent</p> <p><b>Solvent</b>- a liquid which is able to dissolve a solute</p> <p><b>Solution</b>- a mixture of solute dissolved in a solvent</p> <p><b>Soluble</b>- The ability to dissolve in a solvent</p> <p><b>Insoluble</b>-A solid which is not able to dissolve in a solvent</p>
<p><b>Wider reading:</b> <a href="https://gizmodo.com/how-to-find-and-purify-drinking-water-in-the-wildernes-1580821351">https://gizmodo.com/how-to-find-and-purify-drinking-water-in-the-wildernes-1580821351</a></p> <p><a href="https://www.bbc.com/bitesize/guides/zgvc4wx/revision/1">https://www.bbc.com/bitesize/guides/zgvc4wx/revision/1</a></p>		

## Science Year 7 Knowledge Organiser: C2 Separation Techniques

<b>KNOW IT</b>	<b>GRASP IT</b>	<b>THINK IT</b>
1. Identify the definition of pure.	1. Describe how a filter works.	1. Compare the similarities and differences of evaporation and distillation
2. Identify the definition of impure	2. Describe the difference between filtrate and residue after filtration.	2. Explain why cold water is used inside the condensing tube
3. Identify the definition of distillation.	3. Describe the method for crystallisation.	3. Write a method for separating a mixture of two liquids with different boiling points
4. Identify the definition of chromatography.	4. Describe the role of the condensing tube.	4. Write a method for separating salt from water.
5. Identify the definition of evaporation.	5. Describe what is meant by the stationary phase during chromatography	5. Write a method for separating the water from salt water.
6. Identify the definition of filtration.	6. Describe how solubility affects the distance that the mixture travels up the stationary phase.	6. Write a method for separating the different colour in an ink.
7. Identify the definition of crystallisation.	7. Describe the difference between a mixture and a compound	7. Write a method for the separation of Sand and water.
8. Identify the definition of soluble.	8. Explain why a pencil line is used during chromatography.	8. What is the equation for working out the Rf value of a mixture?
9. Identify the definition of a solvent.	9. Explain why filtration cannot be used to separate salt from salt water	9. What is Rf value a measurement of?
10. Identify the solvent and the solute in a glass of salt water.	10. Describe which methods you would use and why, to separate a mixture of salt sand and water.	10. Research another form of chromatography and explain when it is used.
Total score	Total score	Total score

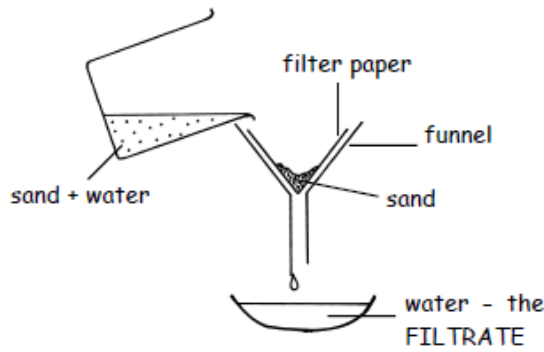
# Scientists Log Book

## Separation Techniques REVISION Spider Diagrams

A large, empty rectangular box with a black border, intended for drawing spider diagrams related to separation techniques.

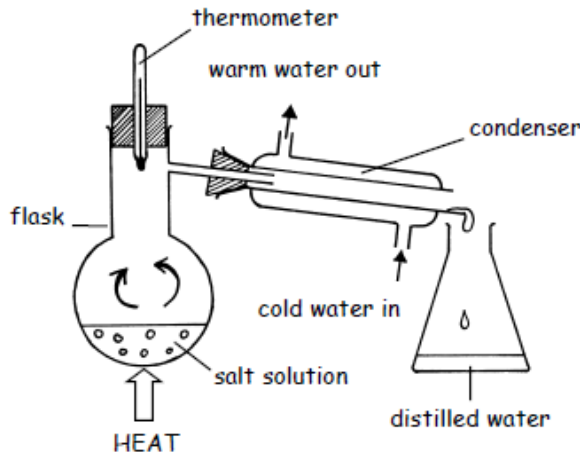


Q1.



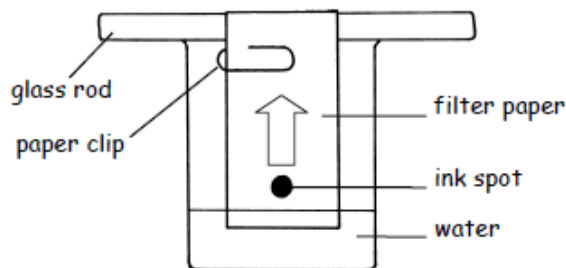
### Filtration.

This method separates small, solid particles from liquids. In the diagram a mixture of sand and water is being filtered. The ..... passes through the filter paper and the ..... is held back. The sand particles are too big to pass through the pores in the .....



### Distillation.

This method separates dissolved chemicals (SOLUTES) from the liquids that they are dissolved in (SOLVENTS). In the diagram salt solution is being separated into salt and ..... The water evaporates from the boiling solution and then condenses as it is ..... in the condenser. The salt is left behind in the .....



### Chromatography.

In the diagram the colours in pen ink are being separated. As water rises up the ..... it takes the colours with it. Different colours travel at different ..... If the ink contains more than one colour they will separate out along the paper.

Exercise 2 - Join up each mixture below with the correct method for separating it.

muddy water

copper sulphate solution

peas and sand

iron filings and sawdust

distillation

filtration

magnetic attraction

sieving





# Scientists Log Book

## SEPARATION TECHNIQUES

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:

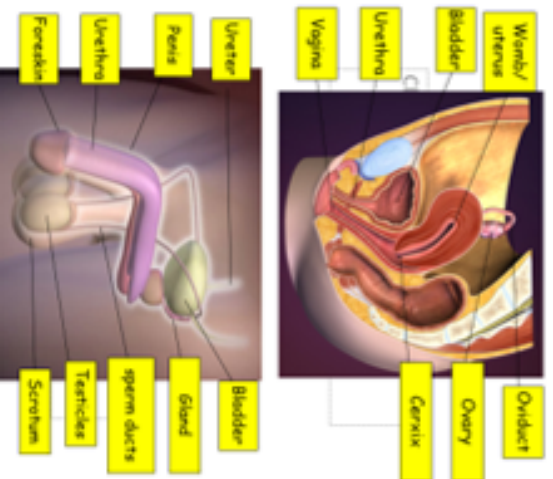
## Science Year 7 Knowledge Organiser: B2 Reproduction and Variation

**Overview of topic:** Describe reproduction in mammals (humans as an example) including fertilisation, gestation and birth. Describe and explain the structure and function of the Human and plant reproductive systems. Explain how and why organisms of the same and different species are varied.

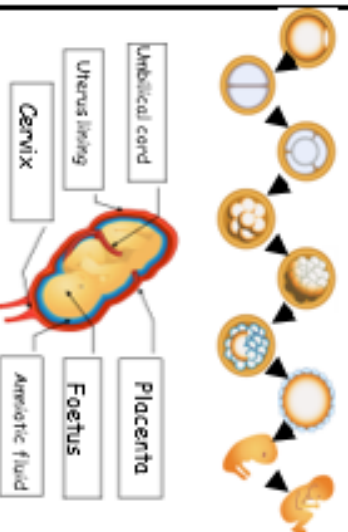
### Key content/ ideas/ concepts

### Keywords/ Glossary

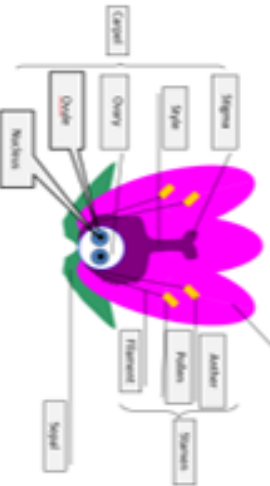
#### Reproductive organs



#### Developing in the Uterus

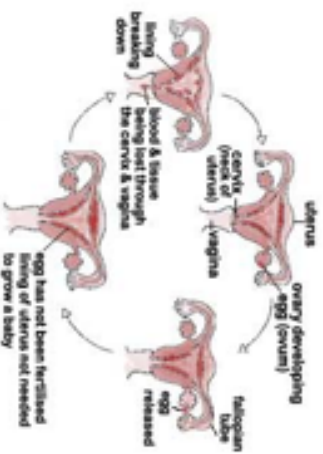


The fertilised egg begins to divide until it forms a fluid filled space. The egg at this stage is known as an embryo and is able to implant into the lining of the uterus. At the site of implantation a placenta forms along with an umbilical cord, these together provide the growing foetus with everything it needs to develop, such as oxygen and food. These products move across the placenta by diffusion.



#### The Menstrual Cycle:

During puberty a girl will start her periods, also known as menstruation. Around once a month, blood from the lining of the uterus leaves the body through the vagina. Each period lasts between 3-7 days. The female reproductive system works in a sequence called the menstrual cycle. This lasts around 28 days.



**Adolescence-** The period of time when a child changes into an adult.

**Puberty-** The physical changes that take place during adolescence.

**Testes-** Organ where sperm and testosterone are produced.

**Urethra-** Tube that carries urine or sperm out of the body

**Sperm duct-** Tube that carries sperm from the testes to the penis.

**Ovary-** Organ that contains eggs

**Oviduct-** Carries an egg from the ovary to the uterus and is where fertilisation occurs.

**Cervix-** The ring of muscle at the entrance to the uterus. It keeps the baby in place while the woman is pregnant.

**Uterus-** Where a baby develops in a pregnant woman.

**Vagina-** Where the penis enters the female's body and sperm is received.

**Anther-** The male part of a flower that produces pollen.

**Petal-** A brightly coloured part of the flower that attracts insects.

**Pollen-** Contains the plant male sex cells found on stamens.

**Stigma-** The female part of the flower that is sticky to catch grains of pollen.

**Style** – The female part of the flower that holds up the stigma.



#### Gametes (Sex Cells)

Sperm has a long **tail** to help it swim towards the egg. It has an **acrosome** to help break into the egg. It has a **nucleus** with half the amount of **DNA**.

The Egg has a **food source** allowing the embryo to develop. It has a **nucleus** with half the amount of **DNA**.

#### Fertilisation:

During the process of fertilisation the egg and the sperm come together and **fuse**. The genetic material of each cell **combines** to create a cell with a full set of chromosomes.



#### Wider reading:

[http://www.bbc.co.uk/1/health/science/organisms\\_behaviour\\_health/reproduction/revision/1/](http://www.bbc.co.uk/1/health/science/organisms_behaviour_health/reproduction/revision/1/)

Know it	Grasp it	Think it
1. Write a definition of adolescence.	1. Describe what fertilisation is.	1. Name the male sex hormone and explain how it causes changes in a male during puberty.
2. Write a definition of puberty.	2. Describe what a zygote is.	2. Name the four hormones involved in female fertility.
3. Write a definition of a hormone.	3. Describe what implantation is.	3. State from which organ(s) these hormones are secreted.
4. Describe 5 changes that occur to males during puberty.	4. State the length of pregnancy in humans	4. Explain how these hormones interact to control the menstrual cycle.
5. Describe 5 changes that occur to females during puberty.	5. Describe how the developing baby obtains food and oxygen during pregnancy.	5. Following fertilisation explain how the cells divide during the development of the foetus.
6. Describe what gametes are.	6. Describe what the menstrual cycle is.	6. Describe what IVF is.
7. Describe how sperm cells are adapted for their function.	7. Describe the stages in the menstrual cycle.	7. Explain how IVF can be used to help people with fertility issues.
8. Describe how egg cells are adapted for their function.	8. Compare, using examples, hormonal and non-hormonal forms of contraception.	8. Explain how the contraceptive pill works to prevent pregnancy.
9. Describe the function of the testes.	9. Compare insect pollinated, and wind pollinated plants.	9. Evaluate the use of hormonal and non-hormonal methods of contraception.
10. Describe the function of the ovaries.	10. Describe four different forms of seed dispersal.	10. Explain how the lifestyle of a pregnant lady can affect the health of the baby.
Total score	Total score	Total score

# Scientists Log Book

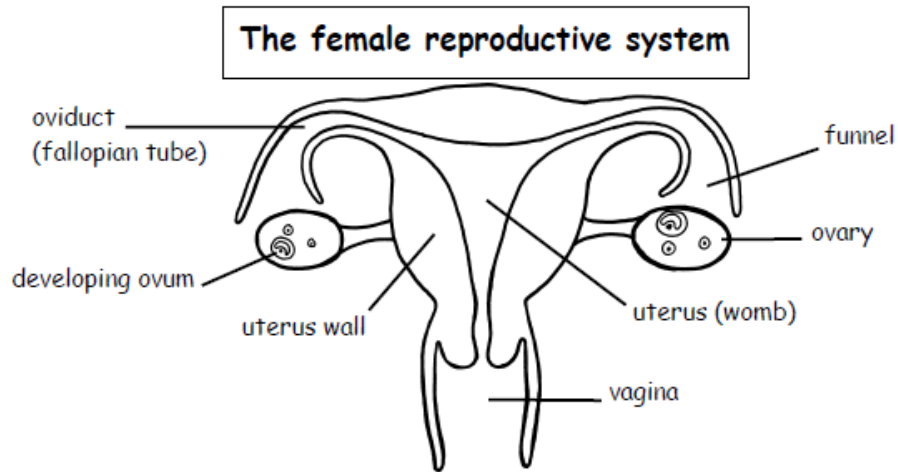
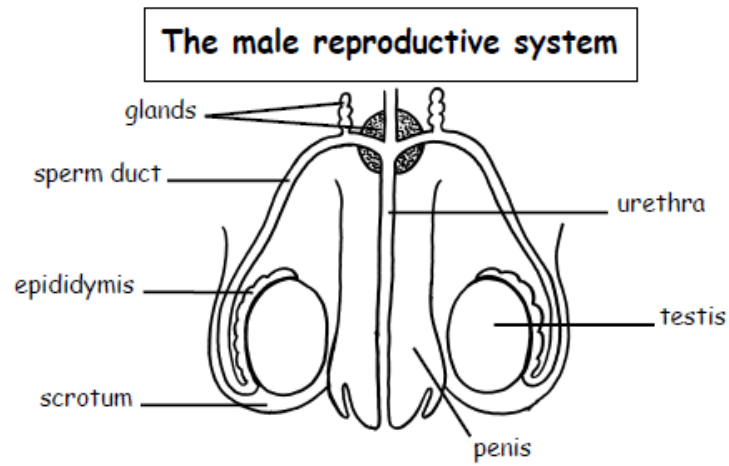


Reproduction REVISION Spider Diagrams

A large, empty rectangular box with a thin black border, intended for drawing spider diagrams.



Q1.



**Exercise** - fill in the missing words in the passage below.

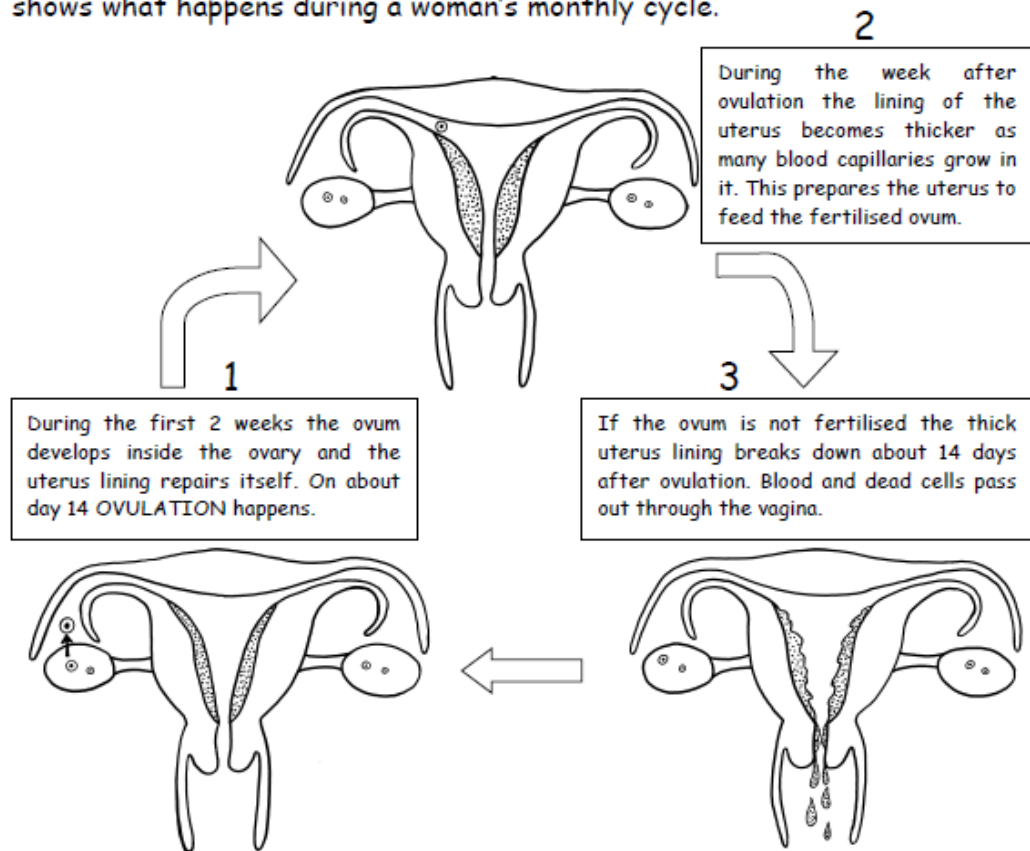
In the man the testes make the ..... cells. The sperms are stored in a coiled ..... called the epididymis. The ..... becomes erect during sexual intercourse. The sperms are carried through a long tube called the sperm ..... to the top of the penis. Here glands make fluids that help the sperms to ..... The urethra is a tube that carries sperms and ..... out of the body.

In the woman the ovaries make the ..... (egg cells). One ovum is produced every ..... The ovum is carried along the ..... (fallopian tubes) down to the uterus (womb). The placenta grows in the uterus wall during pregnancy. This gives the developing baby ..... and oxygen.

**duct urine ova food sperm tube month swim oviducts penis**

Q2.

Once every month a woman's body releases an ovum (egg cell) into the oviduct (fallopian tubes). Usually the ovum is not fertilised and it dies. The woman has her period when the lining of the uterus breaks down and blood and dead cells pass out through the vagina. The diagram below shows what happens during a woman's monthly cycle.

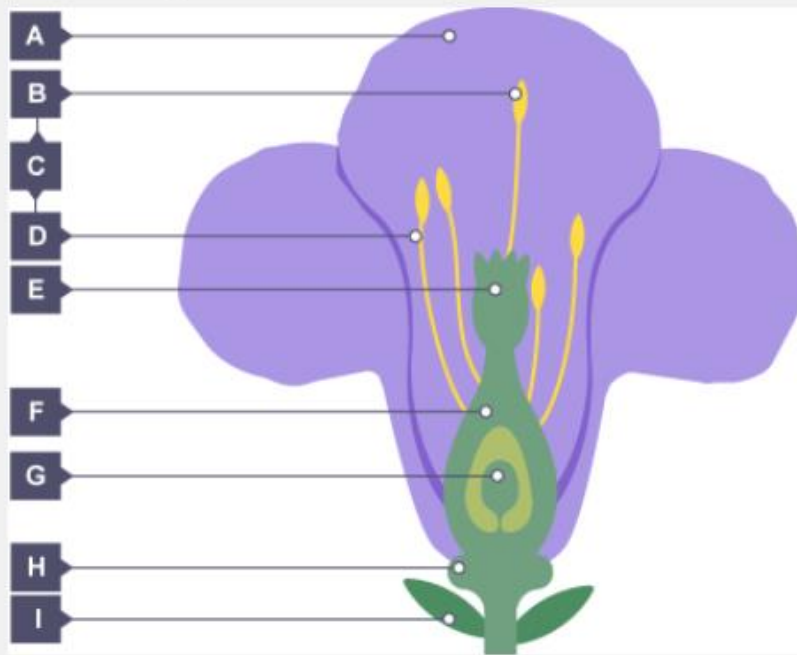


Exercise - Complete the sentences below.

- 1) Only one ovum is released every \_\_\_\_\_
- 2) The release of an ovum from the ovary is called \_\_\_\_\_
- 3) Ovulation happens after about \_\_\_\_\_ days.
- 4) The uterus lining \_\_\_\_\_ the fertilised ovum.
- 5) If the ovum is not fertilised it will \_\_\_\_\_
- 6) A woman has her period when the \_\_\_\_\_ lining breaks down.

**Q3.**

For questions 1 - 6 identify the named structures on the below diagram.



**1** Which letter points to the sepals?

- I
- A
- H

**2** Which letter points to the petals?

- I
- A
- B

**3** Which letter points to the stamen?

- E
- B
- C

**4** Which letter points to the anther?

- E
- B
- H

**5** Which letter points to the stigma?

- G
- F
- E

**6** Which letter points to the ovary?

- G
- F
- H

**7** Where is pollen produced?

- Anther
- Stigma
- Ovary

**8** Which part of the flower develops into the fruit?

- Ovary wall
- Ovule
- Stigma

**9** Where does fertilisation occur?

- Ovary
- Ovule
- Stigma

**10** How do peas disperse their seeds?

- Wind
- Animals
- Self-propelled





# Scientists Log Book

## REPRODUCTION

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

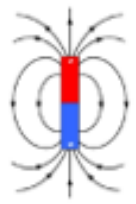
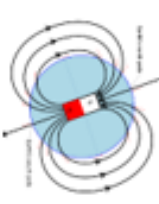

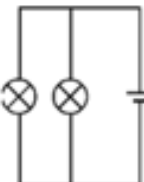











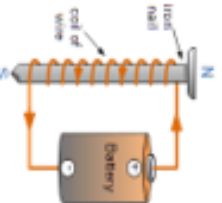
Question(s) I would still like to ask:



## Year 7 Science knowledge organiser: P3 Electricity and Magnetism

**Overview of topic:** You will know the symbols, names and functions of the components and a circuit and how to draw them. You will also be able to state the interactions between 2 magnets, the magnetic field which surrounds magnets and how this relates to the Earth. You will describe the current and how this can be measured in the circuit.

### Key content/ ideas/ concepts

Circuit components			Drawing circuits rules	Keywords/ Glossary
<b>Name of component</b>	<b>Symbol</b>	<b>Function</b>	<ul style="list-style-type: none"> <li>✓ Pencil and a ruler</li> <li>✓ A rectangle shape</li> <li>✓ All components connected</li> <li>✓ 2D and using the circuit symbols</li> </ul> <p>Magnetic fields and drawing them</p> <p>A magnet's magnetic field is the around in which the force can act. These are drawn using clear 'field lines' with arrows pointing from N → S</p>   <p>The geographic North = magnetic south The geographic South = magnetic north</p>	<p><b>Current:</b> The flow of electric charge around a circuit.</p> <p><b>Series circuit:</b> A circuit in which the current only has 1 route to flow</p>  <p><b>Parallel circuit:</b> A circuit in which the current has 2 routes to flow</p> 
Cell		Provides stored energy to the circuit in the form of chemical energy (more than 1 cell = battery)		
Wire		Allows the electrical energy to flow through to the next component		
Switch	 <small>(Switch (open))</small>  <small>(Switch (closed))</small>	Can allow the electrical energy to flow (closed) or break to circuit (open)		
Bulb		Gives out light energy. This converts the electrician energy to light energy		
Ammeter		Measure the flow of electrons (small charged particles) in the circuit. Also known as the current.		
Voltmeter		Measuring the voltage (energy give to components)- you will do this in more detail in year 8.		
Resister		Measures how easy/ hard it is for the electrons to flow (the current to flow)- you will do this more in year 8.		
<b>Magnets</b>	  	<p>Opposite poles = <b>attract</b> (pull towards)</p> <p>Same poles = <b>repel</b> (push away)</p> <p>Any poles + a magnetic material = <b>attract</b></p>	<p><b>Electromagnets</b></p>  <p>This electromagnet can be switched on/ off.</p> <p>Increasing the number of coils in the wire of increasing the voltage (energy) of the battery can increase the strength of the electromagnet</p>	<p><b>Insulator:</b> Materials that do not conduct electricity well.</p> <p><b>Electromagnet:</b> Magnets that are created by wrapping a coil of wire wrapped around a magnetic core</p> <p><b>Magnetic material:</b> Will always be attracted to a magnet, will not repel. Iron, nickel and cobalt are the only magnetic elements</p> <p><b>Wider reading</b></p> <ul style="list-style-type: none"> <li>- 'The Martian', by Andy Weir.</li> <li>- 'American Experience: Tesla', Netflix documentary about Nikola Tesla.</li> </ul>

Know it	Grasp it	Think it
1. What is current a measure of and what are the units of current?	1. State two differences between series and parallel circuits.	1. Describe an experiment to show how you can find out the shape of a magnetic field.
2. What meter do you use to measure current?	2. What happens to the current if you add more bulbs to a series circuit?	2. Describe how you can use a nail, a piece of wire, crocodile clips, leads and a battery to make an electromagnet.
3. State the two poles of a magnet and describe which poles attract and which repel.	3. What happens to the current in other branches if you add another branch to a parallel circuit?	3. In a circuit with a single bulb, the current is 0.2A. Calculate the current if you add another bulb in series with the first bulb.
4. What do we call more than one cell used together in a circuit?	4. What happens to the total current if you add more branches to a parallel circuit?	4. A bulb in a circuit has a current of 0.6A through it and a potential difference of 12V across it. Calculate the resistance of the bulb.
5. What happens in the wires when you close the switch in a circuit?	5. How is the potential difference split across each component in a series circuit?	5. Compare the resistance of conductors and insulators.
6. What is potential difference a measure of and what unit is potential difference measured in?	6. Describe the potential difference across each component in a series circuit.	6. Explain why the needle of a compass always points in the same direction wherever you point it.
7. What meter do you use to measure potential difference?	7. Describe the potential difference across each component in a parallel circuit.	7. Compare the readings on ammeters and voltmeters when you connect them in series and parallel circuits.
8. What type of material can you use for the core of an electromagnet?	8. State the equation for calculating current, including units.	8. State the parts of an electric motor and describe how a motor works.
9. How are components joined together in a series circuit?	9. Define a conductor and an insulator.	9. Only one of Mr Jones' headlights is working on his car. Are the series connected in series or parallel? Explain your answer.
10. How are components joined together in a parallel circuit?	10. State 3 things that affect the strength of an electromagnet.	10. A cell connected to two bulbs in a series circuit will last longer than if it is connected to the same two bulbs in a parallel circuit. Explain why.
Total score	Total score	Total score

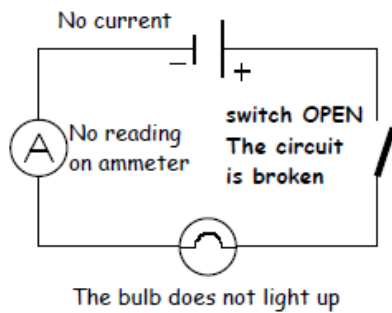
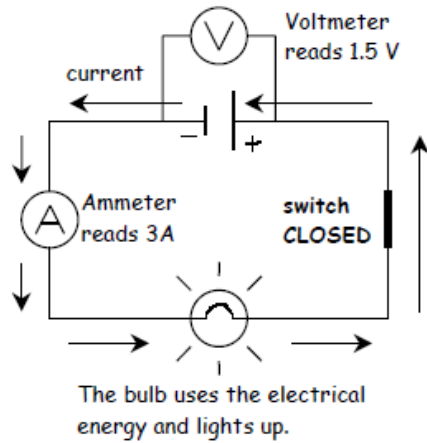
# Scientists Log Book

## Electricity and Magnetism REVISION Spider Diagrams






A large, empty rectangular box with a black border, intended for drawing spider diagrams related to the revision topic.



Q1.



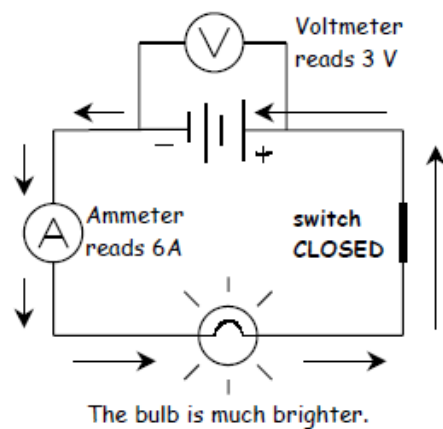
### Symbols

-  A cell (battery).
-  A switch. This connects two leads.
-  A voltmeter. This measures the voltage across the battery terminals.
-  An ammeter. This measures the size of the electric current in AMPS (A).
-  A bulb. The brightness gives some idea of how much electricity is flowing.

### The effect of increasing the voltage.

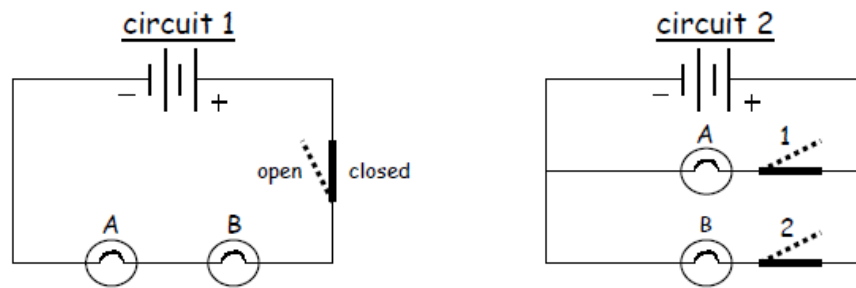
The diagram opposite shows what happens if two batteries are put into the circuit. Carefully compare it to the first diagram at the top of this page and then try to complete the missing words in the passage below.

A battery pushes out the C \_\_\_\_\_ The voltage across both batteries can be measured using a V \_\_\_\_\_ With two batteries there is T \_\_\_\_\_ as much voltage. This produces twice the current and so the bulb is much B \_\_\_\_\_ The negative end of one battery must be connected to the P \_\_\_\_\_ end of the other battery. If they are connected the wrong way round the current will not F \_\_\_\_\_



Q2.

Exercise 2 - Study the two circuit diagrams below and then try to complete the sentences.



- 1) If the switch is opened in circuit 1 both bulbs would \_\_\_\_\_
- 2) If bulb A is removed from circuit 1 bulb B would get \_\_\_\_\_
- 3) If switch 1 is opened in circuit 2 only bulb \_\_\_\_\_ would light up.

Q3.

**1** Which of the following are magnetic poles?

- North and south
- East and west
- Red and blue

**2** Which of the following is not a magnetic material?

- Steel
- Cobalt
- Aluminium

**3** What do two poles of the same type do when they are brought close together?

- They attract
- They repel
- Nothing

**4** What do two unlike poles do when they are brought close together?

- They attract
- They repel
- Nothing

**5** The arrow on magnetic field lines shows them flowing in which direction?

- From south to north
- From north to south
- From left to right

**6** Where are the field lines most concentrated around a bar magnet?

- At both poles
- In the middle
- At the north pole only

**7** How can we increase the strength of an electromagnet?

- Add an iron core
- Reduce the number of turns on the coil
- Reduce the current in the coil

**8** What is one difference between electromagnets and bar magnets?

- Bar magnets can be turned off but electromagnets cannot
- Bar magnets have a magnetic field but electromagnets do not
- Electromagnets need electricity but bar magnets do not

**9** What can we use to find the shape of a magnetic field?

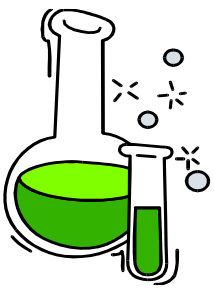
- An electromagnet
- A coil of wire
- A compass

**10**

Which of these doesn't usually use an electromagnet?

- A compass
- A school bell
- A speaker





# Scientists Log Book

## ELECTRICITY AND MAGNETISM

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:





## Year 7 Science Knowledge Organiser: C3 Chemical reactions 1

KNOW IT	GRASP IT	THINK IT
1. Write a definition of an atom.	1. Describe the various ways to identify that a chemical reaction has taken place.	1. Explain why endothermic reactions take in energy and reduce the temperature of the surroundings.
2. Write a definition of an element.	2. Explain why scientists use chemical symbols for elements.	2. Explain why exothermic reactions give out energy and increase the temperature of the surroundings.
3. Write a definition of compound.	3. Describe the temperature change during an exothermic reaction.	3. Explain the trends of the group 1 metals
4. Give four examples of physical changes.	4. Describe the temperature change during an endothermic reaction.	4. Explain the trends of the group 7 elements
5. Give four examples of chemical changes.	5. Write a word equation for the reaction between iron and oxygen.	5. Explain the difference between chemical and physical reactions
6. Identify what is meant by the term physical change	6. Describe the law of conservation of mass.	6. Explain the difference between reversible and irreversible reactions.
7. Identify what is meant by the term chemical change	7. Describe what happens to bonds during chemical reactions.	7. Explain the term activation energy.
8. Describe what a word equation is.	8. Write a symbol equation for a combustion reaction with methane.	8. Explain why Dimitri Mendeleev left gaps in his periodic table.
9. Describe what happens to atoms in a chemical reaction.	9. Write a symbol equation for a reaction between hydrogen and oxygen.	9. Write a guide on how to balance equations.
10. Describe where you can find the chemical symbol of an element.	10. Describe the changes you would see during the oxidation of iron.	10. Explain the differences between iron oxide and aluminium oxide.
Total score	Total score	Total score

# Scientists Log Book

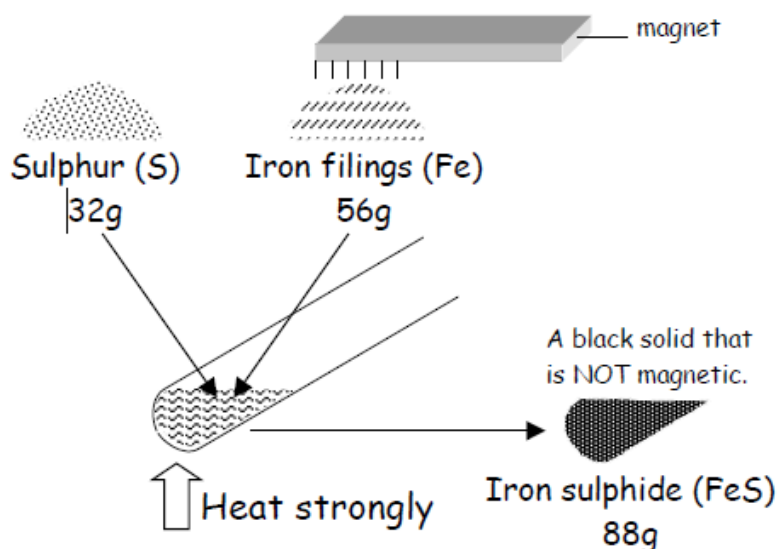
## Chemical Reactions REVISION Spider Diagrams

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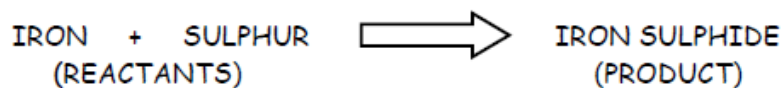


**Q1.**

All of the different materials around us have been formed by chemical reactions from about one hundred simple elements. The diagram below shows a chemical reaction between the elements iron and sulphur.



This reaction can be shown as a word equation:



The new substance formed is a compound called iron sulphide. It has different properties to the iron and sulphur that it is made from.

**Exercise 1** - fill in the missing words in the sentences below.

1. The mass of the reactants (starting chemicals) is E \_ \_ \_ \_ to the mass of the products (the chemicals that are made).
2. The products have different P \_ \_ \_ \_ \_ \_ \_ \_ to the reactants.
3. During a chemical reaction H \_ \_ \_ is either taken in or given out.
4. A chemical change is difficult to R \_ \_ \_ \_ \_ (go backwards).

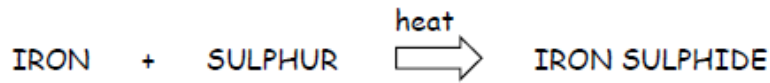
**Exercise 2** - Join up each word in the left hand column with its meaning on the right.

ELEMENTS	The chemicals that are made.
PRODUCTS	The simplest substances.
COMPOUND	Starting chemicals.
REACTANTS	Elements joined together.

There are several different types of chemical reaction.

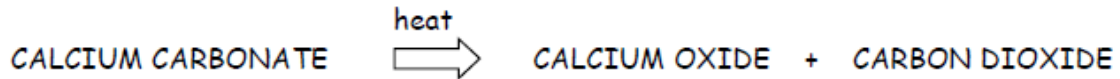
### Synthesis

Two or more substances join together to make a single new substance. For example when iron and sulphur are heated together :



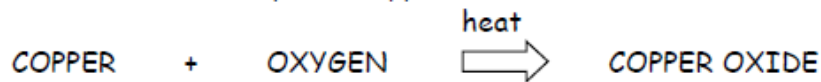
### Decomposition

A substance breaks down into simpler substances. For example, if calcium carbonate (limestone) is heated to a very high temperature :



### Oxidation

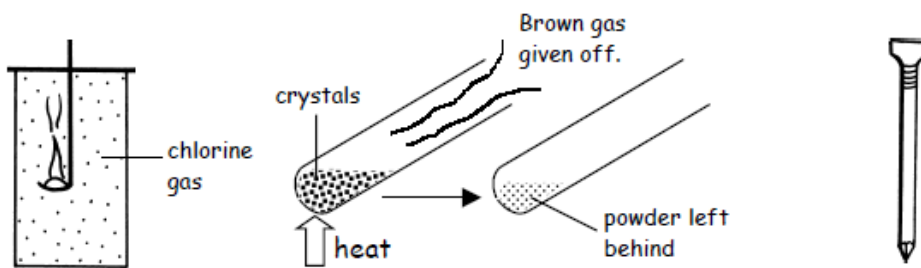
A substance gains oxygen during a chemical reaction. The substance that gains the oxygen is **OXIDISED**. For example, if copper is heated in air :



Exercise 1 - Complete the sentences below.

- 1) Synthesis means when substances \_\_\_\_\_ together.
- 2) Decomposition means when a substance \_\_\_\_\_ down.
- 3) Oxidation is when a substance gains \_\_\_\_\_ in a chemical reaction.

Exercise 2 - For each diagram below write down the type of chemical reaction it shows.



1) Burning sodium metal in chlorine gas to form sodium chloride (salt). This type of reaction is :

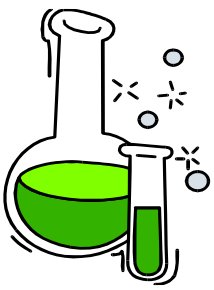
\_\_\_\_\_

2) Heating white lead nitrate crystals to produce a yellow powder and a brown gas. This type of reaction is :

\_\_\_\_\_

3) If an iron nail is exposed to air it forms orange iron oxide (rust). This type of reaction is :

\_\_\_\_\_



# Scientists Log Book

## CHEMICAL REACTIONS

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:



## Science Year 7 Knowledge Organiser – B3 Interdependence

**Overview of topic:** Describe the relationships within a food web. Explain the impact of a new consumer to the food web. Describe the impact of bioaccumulation on an organism. Describe and explain why insects are so important to food security. Explain the importance of plant reproduction through insect pollination in human food security.

**Key content/ ideas/ concepts**

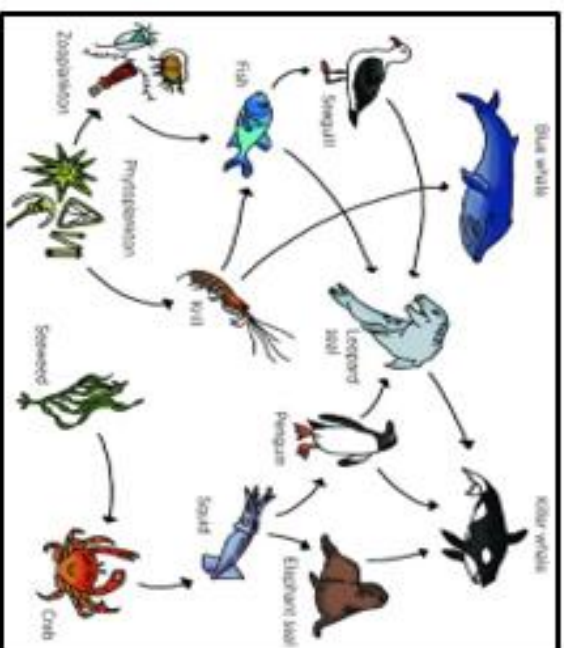


Fig 1 a Food marine web

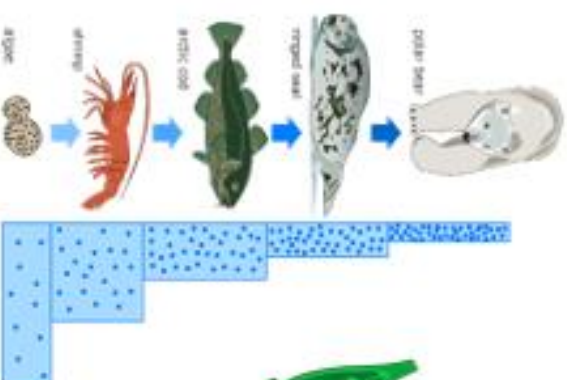


Fig. 1b. Bioaccumulation in an arctic chain

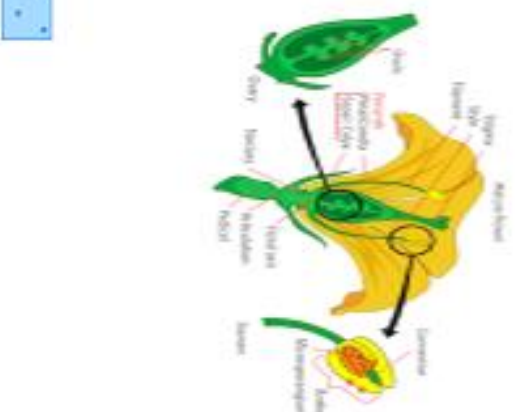


Fig 2a. Reproductive parts of flower

If pollinators died we would see food shortages.

Reasons pollinators may die:

- o Climate change
- o Habitat loss - replaced with monocultures
- o Disease
- o Pesticides

### Section 7: Insects and human food supplies

Insects are vital for pollination of plants. As a result plants are adapted to attract them

Nectar	Sweet taste to attract insects
Scent/perfume	Pleasant smell to attract insects
Bright colours	Bright colour and patterns can attract insects (some plants mimic insects to attract them like a male would)
Moderate amount of pollen	Prevents wastage of pollen
Pollen is sticky or spiky	Sticks to insects to be transferred between plants
Anthers and stigma inside the flower	Pollinators/insects can contact them
Stigma is sticky	Pollen attaches easily

### Keywords/ Glossary

**Adaptation** – How an organism has changed to survive in their surroundings

**Bio accumulate**- build- up of chemicals in an organism

**Carnivore** – A meat eater

**Decomposer** – breaks down large compounds into elements

**Food chain** – a diagram to show the energy transferred when animals and plants are eaten

**Habitat** – This is the place where an organism lives

**Herbivore** – An animal that eats plants only

**Omnivore** – An animal that eats both plants and animals

**Predator** – An animal that hunts other animals for food

**Prey** – An animal that is hunted

**Producer** – A plant that makes its own food.

**Trophic level** – feeding level



## Science Year 7 Knowledge Organiser – B3 Interdependence

KNOW IT	GRASP IT	THINK IT
1. State the name of the first living organism in a food chain.	1. State 3 things that plants compete for.	1. Explain how a new disease in one animal could affect the population of other species in the ecosystem.
2. State what eats the plant in a food chain.	2. Define a biotic factor.	2. Describe alternative ways of securing high yields
3. Give an example of a secondary consumer.	3. Define an abiotic factor.	3. Give an example of is the benefit of biological pest control?
4. State the term to describe an animal that only eats plants.	4. State the term that describes an animal that looks for animals that have already died to eat.	4. Describe the benefit of using a biological pest control?
5. State the term to describe an animal that only eats animals.	5. Draw a food chain with 3 organisms in.	5. If a fertiliser is released into a lake why do the fish die?
6. State the term to describe an animal that eats both animals and plants.	6. Draw a food chain with 4 organisms in.	6. Why do growers keep bee hives near to their orchards?
7. State the term to describe an animal that hunts.	7. Explain the effect on the other organisms if a new predator is introduced in the food web (Figure 1, overleaf)	7. Why does the government pay farmers to leave fields alone?
8. State the term to describe an animal that is hunted.	8. What is a pesticide?	8. What is a monoculture?
9. State the word equation for photosynthesis.	9. what is a fertiliser?	9. Why do monocultures lead to a reduction in biodiversity
10. State 3 things that animals compete for.	10. What is biodiversity?	10. Why would intercropping support organic farming and increase biodiversity?
Total score	Total score	Total score

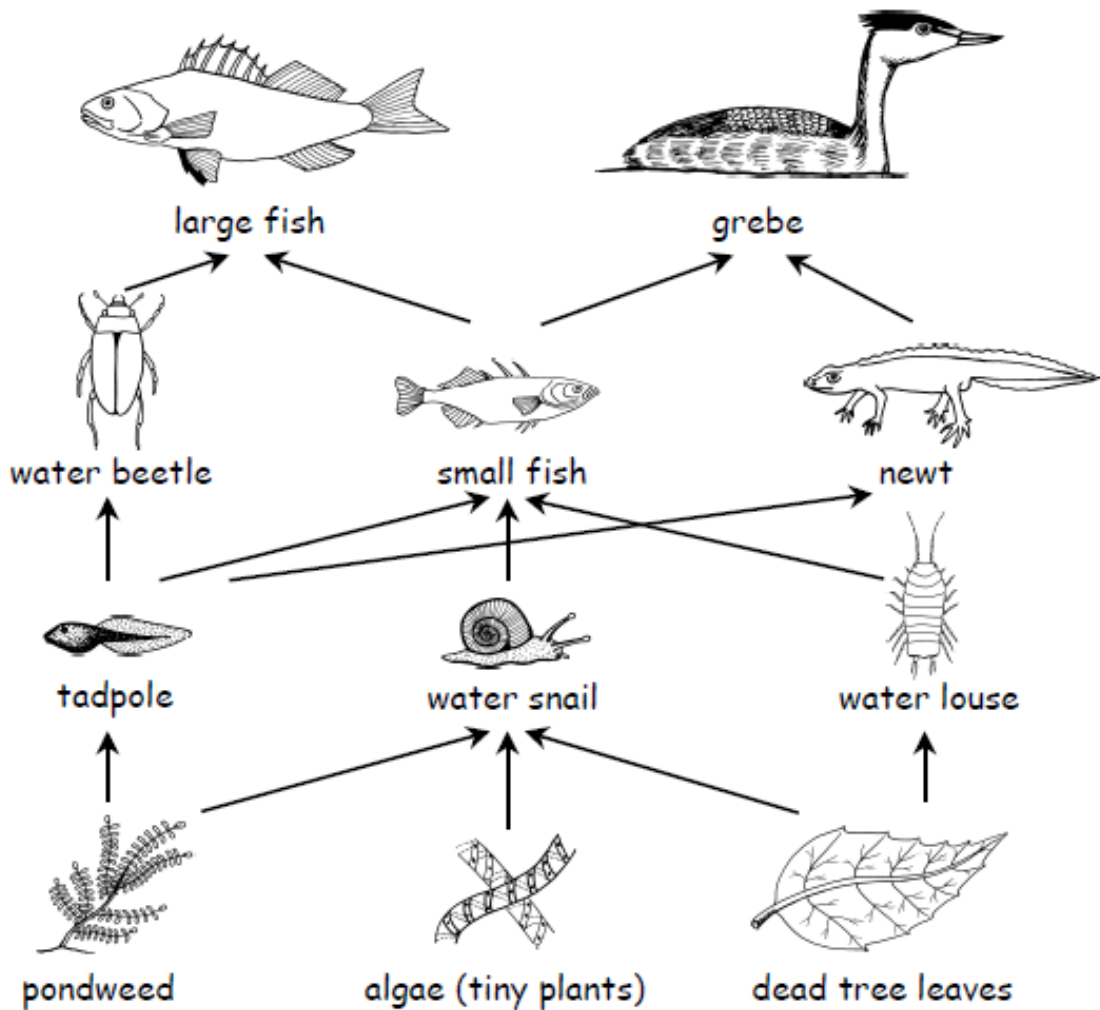
# Scientists Log Book

## Interdependence REVISION Spider Diagrams

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Food chains can be connected together to make FOOD WEBS. The diagram below shows a food web in a lake.

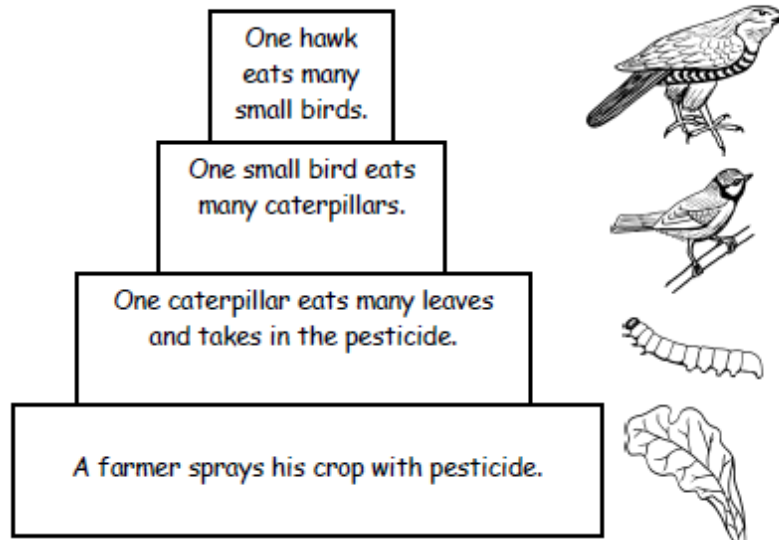


**Exercise** - Complete the food chains and sentences below.

PONDWEED → ..... → WATER BEETLE → LARGE FISH  
 LEAF → WATER LOUSE → ..... → GREBE

- 1) The predators of small fish are \_\_\_\_\_ and \_\_\_\_\_
- 2) The prey of water beetles are \_\_\_\_\_
- 3) The prey of grebes are \_\_\_\_\_ and \_\_\_\_\_
- 4) The animal that **only** eats dead tree leaves is the \_\_\_\_\_
- 5) The 3 **herbivores** are \_\_\_\_\_ and \_\_\_\_\_
- 6) The 2 top **predators** are the \_\_\_\_\_ and \_\_\_\_\_

Farmers often spray their crops with PESTICIDES to kill pests such as insects and weeds. Pesticides may stay in the environment (surroundings) a long time and poison animals higher up the food chains. Pesticides can also be washed into streams and ponds. The diagram below shows how pesticides can build up along food chains.



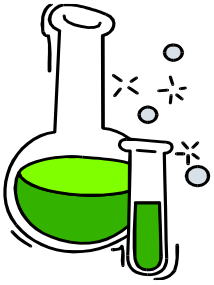
If the pesticide is passed on from the caterpillars into small birds and then into the hawk we can see how it would quickly build up in the hawk's body. Scientists are now trying to make pesticides that only affect the pest and break down a short time after they have been used. They are also trying to find other ways of controlling pests by using their natural enemies. This is called BIOLOGICAL CONTROL.

Exercise - Complete the sentences below.

- 1) P \_\_\_\_\_ are poisons that kill pests.
- 2) Pesticides can get into food C \_\_\_\_\_ and poison other animals.
- 3) Small B \_\_\_\_\_ eat many insects which may have pesticides in them.
- 4) Hawks may be P \_\_\_\_\_ by eating birds that contain pesticides.
- 5) Pesticides can also be washed into S \_\_\_\_\_ and P \_\_\_\_\_
- 6) B \_\_\_\_\_ control means using a pest's natural enemy to destroy it.

Exercise - Complete the missing words in the passage below.

A ..... is a number of organisms of the same species living in one place. There are a number of factors that control how big a population of animals can ..... Competition for ..... and space is important. As the population grows there will be ..... competition and so more animals will ..... Predators are also important in controlling the numbers of ..... animals. If the number of predators increases more prey will be ..... If the number of predators decreases more prey will ..... In the same way, the ..... of a predator's population is controlled by the numbers of its prey. If there are more prey there will be more predators. A population stays steady when the number of births equals the number of .....



# Scientists Log Book

## INTERDEPENDENCE

What we did in science this topic:

Keywords I found difficult:

What new ideas I have found out / What new ideas I have learnt:

Question(s) I would still like to ask:



# Revision Advice

Good grades require efficient revision, hard work and dedication but it's worth it in the end because you really feel great when you get them!

OK OK I expect you already know that – so let's get down to it. It's all down to the four **R's**; **R**eview, **R**evise, **R**epeat and **R**emember. If you work in that order you will be fine – honest!



**Before you do anything** find out your concentration span (How long your brain will work hard for without a break). Go somewhere quiet with a lovely science textbook and before you start to read make a note of the time. Read a new subject and really try to understand it as you go along. When you catch yourself thinking about something else, like what's on TV tonight or something equally exciting like a fantastic science lesson earlier in the day, make a note of the time again. You will probably find you have concentrated for between 20 and 40 minutes. Most people can only concentrate for short periods of time – don't worry if yours is shorter than this; it will also depend on how tired you are. When you start revising **DO NOT** work for periods longer than your concentration span – you will just be wasting time! Work up to your concentration span but no longer and then take a 5-minute break – only 5-minutes! Then sit down for another session.

**Review – what does that mean?** It's simple really, read through the topics you are going to be tested on so that your brain starts to work on the whole topic. You'd be amazed what your brain can do without you having to think about it! It will start to put things in order, organise related ideas and bring to your attention the things you aren't too sure about. It's a good time to start writing out keywords and definitions – but don't start to do that until you have read through **ALL** the topics you are going to be tested on.

**Revise and Repeat – what does that mean?**

- After reading through your notes (exercise and log books) write out the definitions of keywords until you can do it without looking at the book.
- Condense the work in your books to make them shorter, do it again and again until you are left with the key points, words or phrases (you could write them on small cards). You should be able to get a **WHOLE TOPIC** onto one sheet of A4 paper!

**Remember – easy for you to say, how?** Easy, peasy lemon squeezy.

- **Use mnemonics** (pronounced 'nem onics') just a fancy word for rhymes and phrases that students use to remember things. For example; the colours of the rainbow **R**ichard **O**f **Y**ork **G**ave **B**attle **I**n **V**ain where the letter at the start of each word represents the first letter of a colour – Red, Orange, Yellow, Green, Blue, Indigo and Violet. Another example might be this – **I** **C**an **N**ow when you can't remember the three elements that are magnetic, they are of course Iron, Cobalt and Nickel. (No rude ones please!). Oh and before I forget how about stalagmites and stalactites? (those things that grow up from the floor or hang from the roof of caves) Remember: stalactites hold 'tight' to the roof. OK, got the idea so far? Good, let's move on then.

- **Spider diagrams** Put a main topic heading in the centre of an A4 sheet of paper and draw lines to other related headings, and then draw more lines off these to other related sub-headings and so on (looks like a web?). Do this the first time before reading your books – that way it will give you an idea of the areas you need to concentrate on because you can compare your spider diagram to your notes in the books.
- **Work with friends in groups** great for sharing ideas and a pizza! Test each other and brainstorm – decide on a topic and then everybody says what they can remember about the topic (don't forget that someone in the group should write it down – decide who before the brainstorming starts because it can get hectic).
- Last but not least keep writing out those keywords and definitions, read aloud, condense your notes and remember to take breaks and take some time out for FUN!

## Top Tips during and after Revision

**DO ASK A TEACHER IF YOU HAVE ANY DOUBTS** – Never, ever, leave something you don't understand – It won't sort itself out SEE A TEACHER WELL BEFORE THE TEST FOR AN EXCITING LIFE CHANGING EXPLANATION!!!

**DO READ THE TEST PAPER ALL THE WAY THROUGH BEFORE YOU START** – Remember how amazing your brain really is! It will get to work on some of those tricky questions before you have even started to answer questions on the test paper and you won't know it's started without you! That way you will reduce the chances of getting to a question you just can't answer – see below.

**DON'T HAVE LATE NIGHTS** - Your brain will go fuzzy and easy problems become hard ones.





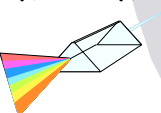
**DON'T SIT AND STARE AT THE PAPER IF YOU CAN'T ANSWER THE QUESTION** – You'd be amazed how easy it is to get in a flap and become an exam zombie. Your mind starts whirling and the harder you try the worse it gets, you think you're the only one struggling, everyone else is writing and you keep telling yourself you can't do it and before you know it you're still on question 3, the times up, 40 minutes has gone by and most people really have written more than you now because they got to question 24 – OK they missed out a couple on the way but hey whose counting? We are! When we mark the test we can only mark those questions that you have attempted. Remember – Don't sit and stare at a question for more than a minute, MOVE ON QUICKLY and if you have time at the end GO BACK (you should always go back and check your answers if you have time anyway). Think about the marks you will gain from moving on - not the one or two you have lost from not answering a couple of questions – remember that amazing brain of yours! When you feel the panic start to rise take a deep breath or two and make yourself slow down it will come to you if you don't allow yourself to panic (and if doesn't you haven't wasted any time on it).

**GOOD LUCK!**



# Skills Sheet

Every time you complete one of the skills tick and date the box. Let your teacher know and they can sign to prove that you can do that scientific skill.

Skill:	I did this on:	Signed by teacher:
I can light a Bunsen burner safely. 		
I can measure a liquid accurately using a measuring cylinder. 		
I can make a slide. 		
I can plot a line graph accurately. 		
I can set up my apparatus properly without help. 		
I can take accurate measurements off digital meters.		
I can use a datalogger correctly to record data. 