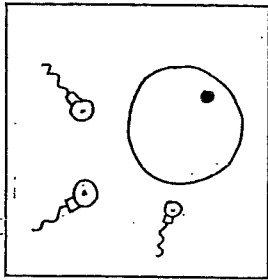
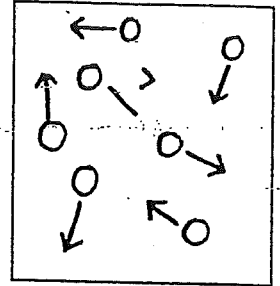
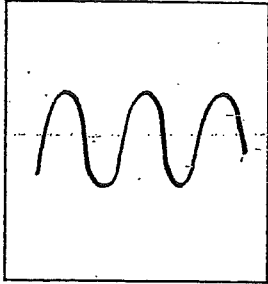
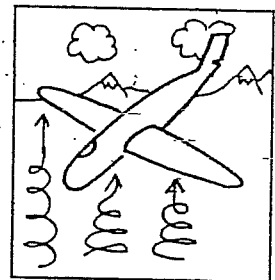
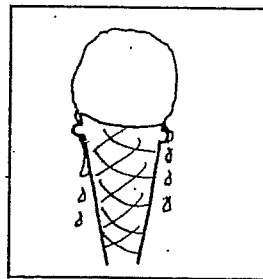
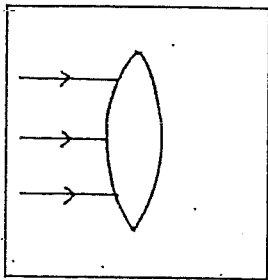


S1 Science



My Big S1 Science Summary Book



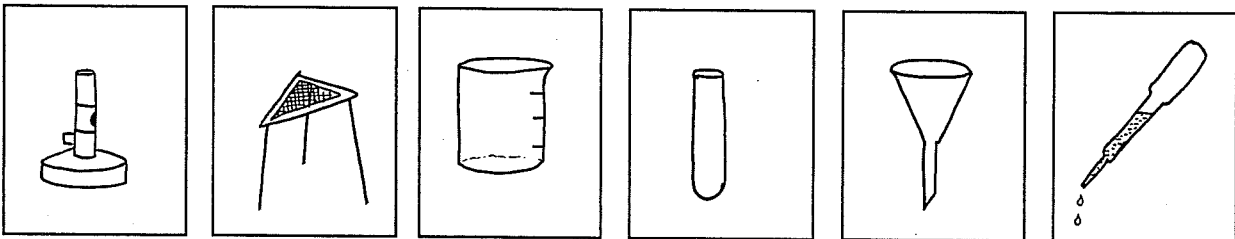
Name _____ Class _____

Teacher _____

1. Safety

1. Always follow the teacher's i_____.
2. Never r_____ in the class.
3. Always place bags under the d_____.
4. Wear g_____ when instructed to do so.
5. Tie loose h_____ back when using a Bunsen burner
6. Never e_____ or d_____ in class.

2. Apparatus

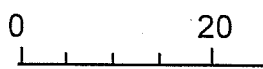


B_____ T_____ B_____ T_____ F_____ D_____
 Burner Stand T_____

3. Measuring - Quantities, Units and Measuring Devices

Quantity	Small units	Big units	Measuring Device
Length	mm, cm		
Time			
Volume			
Mass			Balance
Temperature		X	

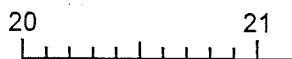
4. Scales: Working out value of each small unit



small unit = $\frac{20 - 0}{4} = \frac{20}{4} = 5$



small unit = $\frac{60 - 50}{5} = \frac{10}{5} = 2$



small unit = $\frac{21 - 20}{10} = \frac{1}{10} = 0.1$

5. Researching

1. Always check at least _____ sources when researching.
2. Referencing a Text:

Author surname, initial / Book Title / Page number / Publisher / date / edition

3. Referencing a web site.

Full web URL (Web address) www.bbc.co.uk/Science/Space/solarsystem.

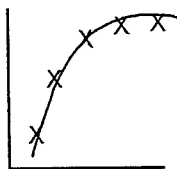
6. Averages

1. The average of a list on numbers tells you the typical value.

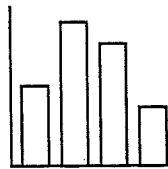
Example what is the average of 5.6 5.2 5.8 4.9

$$\text{Average} = \frac{\text{All numbers added up}}{\text{Number of values}} = \frac{5.6 + 5.2 + 5.8 + 4.9}{4} = \frac{21.5}{4} = 5.4$$

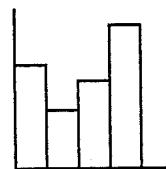
7. Graphs



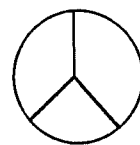
Line graph



Bar graph

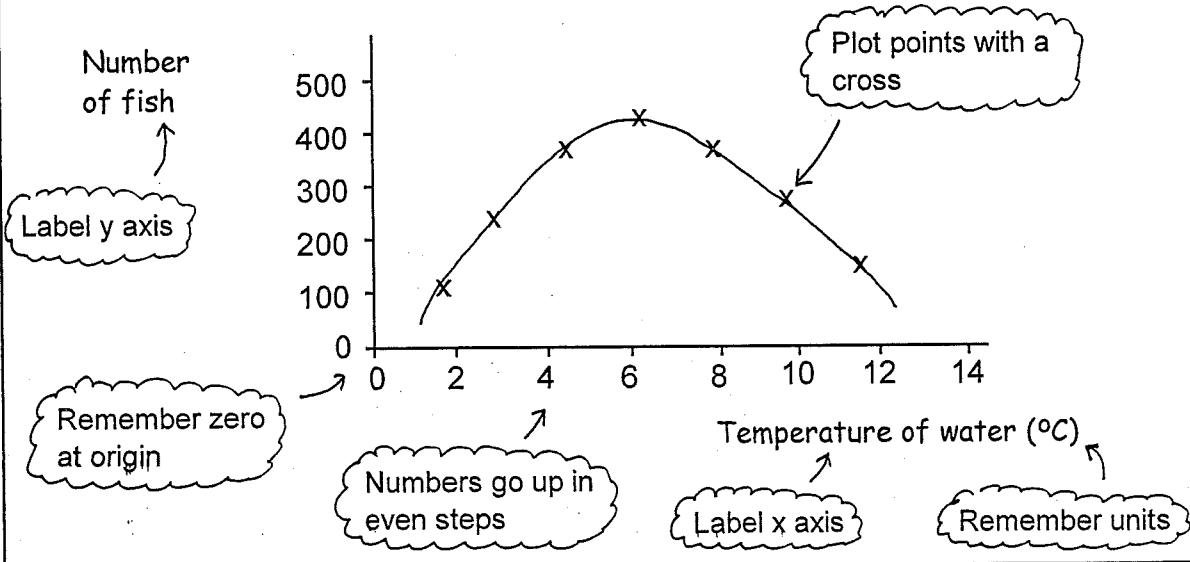


Histogram



Pie chart

8. Drawing a Line Graph



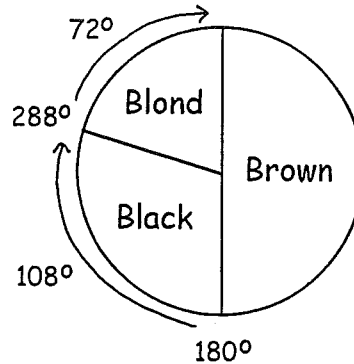
9. Drawing a pie chart

There are 400 children in a school. 200 have brown hair 120 have black and 80 have blond. The whole pie chart = 360° . How many degrees is each sector going to be?

$$\text{Brown hair } \frac{200}{400} \times 360^\circ = 180^\circ$$

$$\text{Black hair } \frac{120}{400} \times 360^\circ = 108^\circ$$

$$\text{Blond hair } \frac{80}{400} \times 360^\circ = 72^\circ$$



10. Working out one number as a percentage of another

What is 24 as a percentage of 60?

$$= \frac{24}{60} \times 100$$

$$= 0.4 \times 100$$

$$= 40\%$$

11. Calculating the percentage of a number

What is 36% of 240?

$$= \frac{36}{100} \times 240$$

$$= 0.36 \times 240$$

$$= 86$$

12. Ratio

What is the ratio of 12 to 36 \rightarrow 12 : 36 divide both by 12 = 1 : 3

What is the ratio of 40 to 6 \rightarrow 40 : 6 divide both sides 2 = 20 : 3

13. Science Investigation

Aim: To find out how variable A affects variable B

Hypothesis: What is your prediction?

As A (increases/decreases) then B (increases/decreases)

Variables: A = Independent variable - The variable I will change
B = Dependent variable - The variable which might depend on A

- Plan:
1. List of equipment and a labelled diagram of set up.
 2. How you will measure the two variables.
 3. How you will change the independent variable.

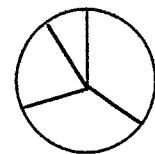
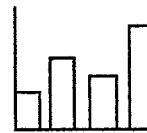
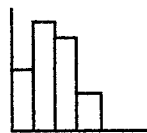
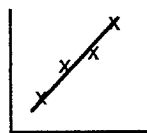
Fair Test: Which variables will you try to keep constant?

Safety: What steps will you take to make sure you work safely?

Results: Usually written in a table.

variable A	variable B

Graph: Present the results as a line graph, histogram or pie chart etc.




Conclusion: This is the answer to the aim

As A (increases/decreases) then B (increases/decreases)

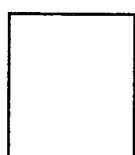
Evaluation: Identify two sources of error (anything which made your measurements inaccurate) in your investigation and ways you could improve the investigation if you had to do the investigation again.

1 Solids Liquids and Gases- The particle model.

1. All matter is made from tiny _____.

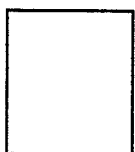
2.  The particles in a solid are very c_____ together. They are held together very tightly by strong b_____ so they **can't** m_____ about freely. The particles can v_____ back and forth in one place. A solid has a fixed s_____ and v_____.

solid



liquid

In a liquid the particles are also very c_____ together but because they are **not** held together very tightly they can m_____ around fairly easily. That is why we can walk through w_____. A liquid has a fixed v_____ but its shape depends on the c_____ it is placed in.



gas

In a gas the particles are very f_____ part and move around very _____. A gas has ___ fixed volume or shape. Its shape and volume both depend on the c_____ it is placed in.

You can't squash solids and l_____ because their particles are very c_____ together. You can squash a gas because the particles are very f_____ apart.

2. Expansion and Contraction.

1. When a material is heated it _____. This is because the particles move or vibrate more q_____ and push each other apart.

2. When a material is cooled it _____. This is because the particles m_____ less quickly and the particles don't push each other apart as much.

3. Diffusion

1. The moving and mixing of particles is called _____.

2. Diffusion happens fastest in a _____ and slowest in _____. This is because gas particles are very _____ apart so there are l_____ spaces for particles to move between. There are only s_____ spaces between solid particles so diffusion happens much s_____.

4. Changing State.

1. A material changes state when it, for example, changes from a s _____ to a l _____ or from a l _____ to a g _____.
2. A solid changing to a liquid is called _____.
3. A liquid changing to a gas is called _____.
4. A gas turning back into a liquid is called _____.
5. A liquid turning back into a solid is called _____.
6. At a materials melting point it changes from a _____ to a _____.
7. At a materials boiling point it changes from a _____ to a _____.
8. Ice melts at _____ C. Water boils at _____ C.
9. Water is strange because it _____ when it freezes.

5. Gases in the Atmosphere, Greenhouse Effect and Water Cycle

1. The air or atmosphere is a mixture of _____. The 2 main gases in dry air are

Gas	Percentage in air	Use
Nitrogen		
	21%	

2. The air also contains small amounts of greenhouse gases which regulate the _____ of the Earth. The most important greenhouse gases are called _____, _____ and _____.
Too little greenhouse gas in the air and the Earth's temperature would _____. Too much greenhouse gas and it would _____.
3. The water cycle is very important for supplying humans with _____ water. The sun's heat _____ fresh water from the salty sea. As the evaporated water rises and cools this fresh water vapour _____ to form clouds of tiny water droplets. The _____ blows the clouds of tiny water droplets inland and over high hills.
As the clouds cool the droplets get _____ until they fall back to Earth as _____ or _____. The water then runs back to the _____ along rivers.

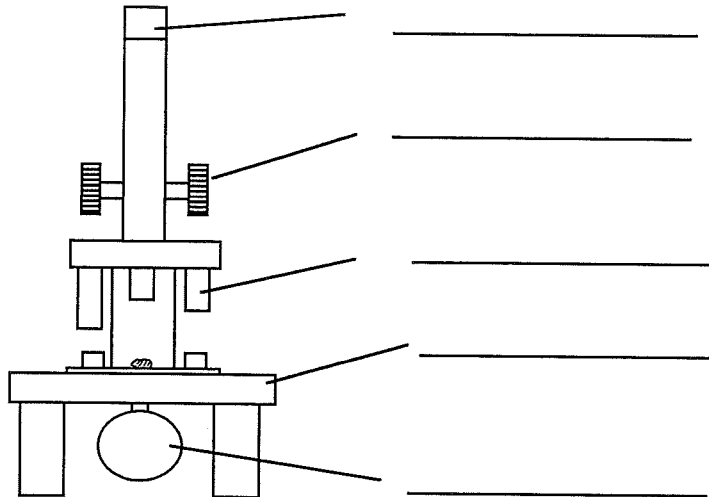
6. Separating materials

When a substance dissolves in a liquid we say it is _____ and a _____ has been produced. If a substance does not dissolve it is _____. The substance being dissolved is called the _____ and the liquid doing the dissolving is called the _____.

1. To separate an insoluble solid from a liquid we would use _____.
For example separating metal pins from water
2. To separate a soluble solid from a liquid we would use _____.
For example separating fresh water from salt
3. To separate mixtures of inks and dyes we use _____.
For example separating the ink in felt pens

1. The microscope

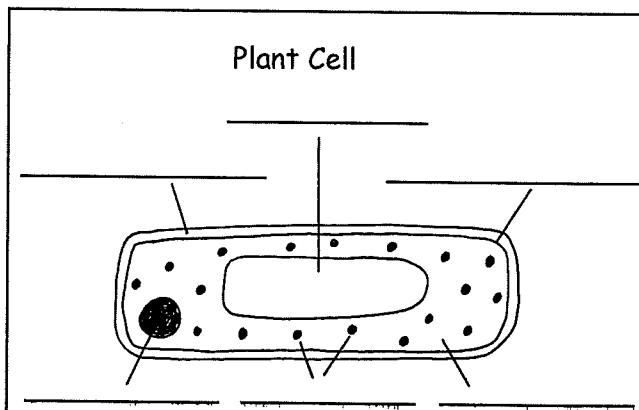
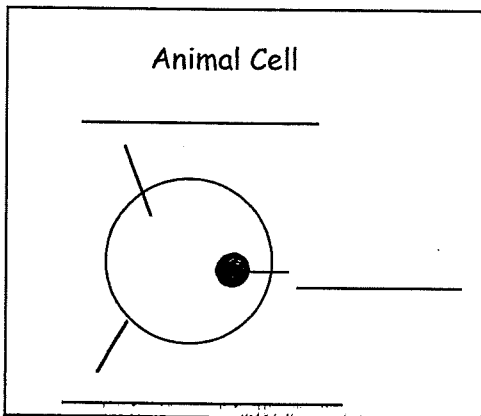
We use a microscope when we want to see objects too _____ to be seen by the naked eye. Label the parts of this microscope.



Part of microscope	Function
Stage	
	Shines light through the specimen
Focus control	
	Magnifies the image
Objective lens	

The power of a microscope = _____ lens × _____ lens
 magnification magnification

2. Parts of a Cell



Part of Cell	Function
Nucleus	Controls the _____ activities. Contains structures called c_____ which are made of D_____
Cytoplasm	Site of most _____ reactions in cell
	Controls what _____ or leaves the cell
Cell wall	Gives the cell shape and _____
Vacuole	Contains a liquid called _____.
	Light energy is turned to food for the plant

3. Specialised Cells

The red blood cells carry _____ around the body
 Root hair cells pick up _____ from the soil
 Palisade mesophyl cells turns _____ energy into food for the plant
 Epithelium cells keep the _____ clean by producing sticky _____.
 Sperm cells are involved in _____
 _____ cells carry water up a plant's stem from the roots to the leaves.
 Nerve cells carry _____ signals around the body.

4. Cells, Tissues, Organs and systems

A group of similar cells all doing the same job is called a _____.
 A group of different tissues working together is called an _____.
 A number of different organs working together is called a _____.

System	organ	Cell/tissue	Fuction	Feature
Reproductive			Fertilise the egg	Has a tail to swim
		Epithelium	Stops germs entering lungs	
Plant transport			Absorbs water from soil	Large surface area
Photosynthesis		Palisade	Converts light to F_____	Contains lots of chloroplasts
Circulatory	Heart		Takes oxygen round body	

5. Monitoring Health

Technology can be used to monitor your b_____ temperature, b_____ pressure, h_____ rate and the lungs peak f_____ rate.

1. What is a Force?

1. A force can change the shape, _____ or _____ of an object.

Here are 7 important forces:

1. Weight - The force which pulls all objects down to the c_____ of the planet.
2. Friction - Force which acts between t_____ surfaces and tries to stop objects m_____.
3. Magnetic - Force created by magnetic materials.
4. Electrostatic - Force created by r_____ plastic objects like b_____.
5. Upthrust - The force pushing ____ on something which is placed in water.
6. Tension - Forces which acts through stretched r_____, elastic bands and springs
7. Reaction - This force pushes up on you when you stand on the g_____ or sit on a c_____

2. Measuring Forces and Balanced Forces

- 1.. Force is measured using a _____ balance.
2. Force is measured in units called _____ or ____ for short.
3. Balanced forces have the same size but are in _____ direction.
4. Balanced forces _____ each other out.
5. If balanced forces act on an object its motion does not _____.

3. Mass, Weight and Gravity

1. Mass is a measure of how much _____ is in an object. The unit for mass is _____ or ____ for short. The mass of an object stays the _____ no matter where you go in the universe.
2. Weight is the force which pulls you down to the _____ of the planet. It is caused by a weird force field called _____.
3. Gravitational field strength g on Earth is the force pulling each _____ of matter downwards. On Earth $g = \text{_____ N/kg}$.
4. The weight of an object = mass of object \times _____ or $W=mg$
5. On Earth $g = 10\text{N/kg}$ so your weight on Earth $W = m \times \text{_____}$

4. Other Planets

1. The g on other planets will be _____ than on Earth.
2. On Earth $g =$ _____ N/kg, On Mars $g =$ _____ N/kg, On Jupiter $g =$ _____ N/kg
3. A person would feel _____ on Mars and _____ on Jupiter.
4. A woman has a mass of 60kg. Her weight on Earth and Mars is

Earth $W = mg =$ _____ \times _____ $=$ _____

Mars $W = mg =$ _____ \times _____ $=$ _____

5. Floating and Density

1. When an object is placed in water a force called _____ is applied upwards on the object.
2. The density of an object is a measure of the amount of _____ is stuffed into _____ cm^3 of its volume.
3. The density of fresh water = _____.
4. An object will float if its density is _____ than the density of water. It will sink if its density is _____ than the density of water.
5. A boat floats because it is mostly made of _____ so it has a very _____ density

6. Air Pressure

1. Air is made up of fast moving _____. When particles hit a surface they cause a _____. This is called _____ pressure.

7. Friction

1. Friction is a force which acts between _____ surfaces
2. Friction is caused by the surfaces being _____.
3. Friction tries to stop objects _____.
4. When friction acts _____ energy is turned to _____ energy.

8. Reducing Friction

1. Friction can be reduced by (a) _____ the surfaces or (b) _____ the surfaces.
2. Hovercrafts are separated from the sea by a layer of _____. Engine parts are separated by _____. A skier can smooth his skis by rubbing them with _____ paper.
3. To reduce air or water friction objects are made _____. This means they are designed to be c _____ and s _____.

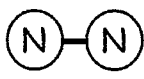
1. Atoms

All substances in the universe are made from tiny wee particles called _____. There are _____ different naturally occurring atoms. All these different atoms can be shown in the p_____ table. The higher the atomic number the larger the size of the _____.

2. Elements

An element is a substance which is made up of only _____ kind of atom. An element cannot be broken down into anything s_____. Each element has its own s_____. The symbol can be a capital _____. If two letters are used the second letter is lower _____.

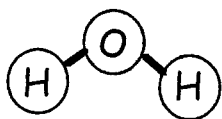
Carbon - _____ Oxygen - _____ Potassium - _____
 Argon - _____ Magnesium - _____ Sodium - _____ Iron - _____

They can sometimes join together to form a m_____. This is called a n_____ molecule. 

3. Compounds

A compound is a substance made from 2 or more different _____ joined together. The properties of the compound are completely d_____ from the properties of the elements which make it up.

We can write down a compound using a chemical formula



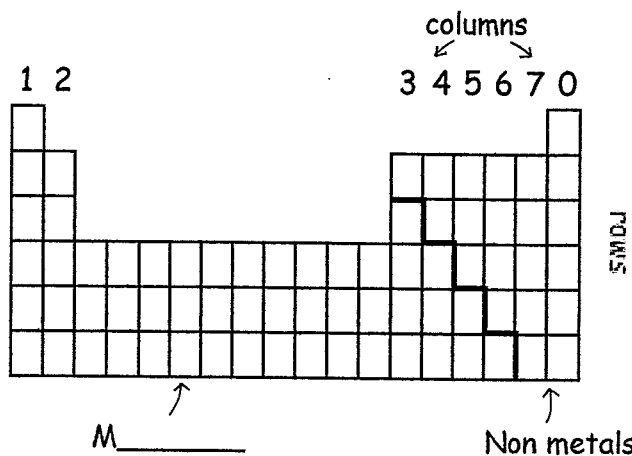
can be written as _____

4. Properties of the elements

The periodic table is a list of all the known e_____

Elements in the table are classified as metal or non _____.

The metals lie to the _____ of the zig zag line.



All metals are good at conducting e_____ and h_____.
 Non metals are _____ good at conducting electricity or heat.
 Carbon is the only _____ metal which can conduct electricity.

Each column is given a group number. Elements in the same column have s_____ properties

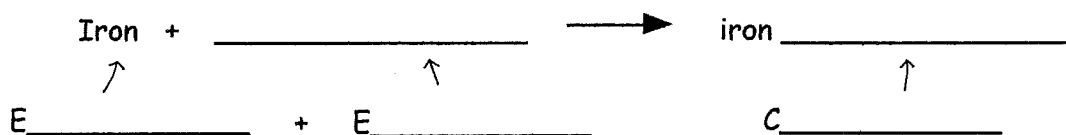
- Group 1 - These elements are known as _____ metals.
 All these metals are reactive with w_____.
- Group 7 - These elements are known as _____
- Group 0 - These elements are known as the _____ gases.
 They are very unreactive.

5. Using density to identify an element

The density of an element tells you how much _____ is contained inside a volume of _____ cm³. As each element has a different density we can use density to i_____ elements.

6. Making compounds and word equations

A word equation is a short hand way of describing what happens when a c_____ is made in a chemical reaction. In this reaction two elements iron and sulphur react to form the compound iron sulphide. The elements are called the r_____. The compound is the p_____.



The ending of the compound is changed to ide or ate to show the compound is a new s_____.

7 Breaking compounds

Compounds can be broken down into their e_____ in 2 ways:

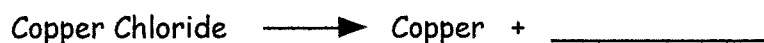
1. Heating the compound.

Some elements can be broken down by heating them with carbon



2. Electrolysis

This involves breaking the compound down using e_____



1. Puberty and Adolescence

Puberty occurs during a _____. This is the time when you change from a child into an adult. Puberty starts between 10-15 and continues until about 18. The changes start _____ for girls.

Changes in Boys:

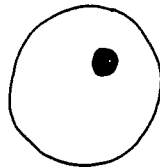
Hair grows under arms, on f_____ and chest. Hair growing round genitals called _____ hair. Shoulders get wider. Testes start to make _____ cells. Voice gets _____ ("breaks"). P_____ grows

Changes in Girls:

Hair grows under arms. Hair growing round genitals is called _____ hair. H_____ get wider. Ovaries start to release _____. B_____ develop.

2. Sex Cells and Reproductive Organs.

The female sex cell is the _____. It is produced in the _____.



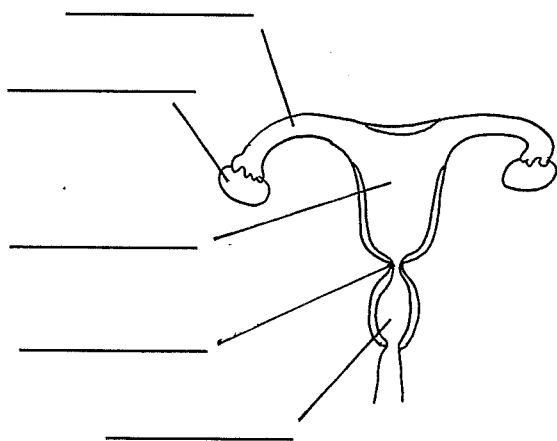
Women release one egg each _____ up until the age of between 45-55.



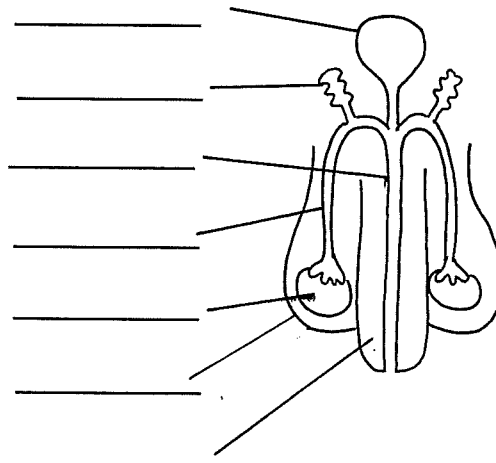
The male sex cell is called _____. Sperm is produced in the _____. Males can produce 200 _____ sperm a day for their entire life.

Reproduction is the process where living things produce o _____. Sexual reproduction requires one male and one _____ parent. The offspring inherit features from _____ parents.

Female reproductive organs



Male reproductive organs



3. The Menstrual cycle (Period)

The menstrual cycle takes between 28 - 32 days.
 At the start of the cycle the lining of the uterus and some blood flows out of the _____. This is called menstruation, it usually lasts for _____ days.
 About _____ days after menstruation starts, an _____ is released from the _____. This is called _____. If the egg is not fertilised by a _____ cell by about the 30th day the uterus lining starts to break down and is passed out of the vagina and the cycle begins again.

4. Sexual Reproduction

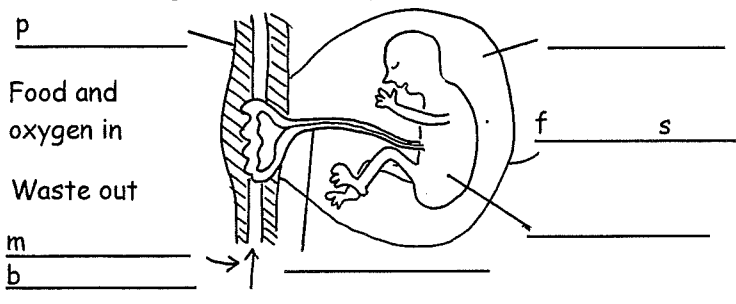
During sexual intercourse, blood floods into the man's _____ and it becomes stiff and _____. He places it inside the woman's _____. When a man ejaculates, sperm is pumped from the testes through the _____ tube past the glands where it picks up _____, then out of the end of the penis into the woman's _____. Here it makes its way through a hole at the top of the vagina called the _____. Sperm then travels up through the _____ and along the _____. If there is an egg present o_____ sperm will burrow into the egg. Inside the egg the sperm's nucleus will join with the egg's nucleus. This is called _____. The newly fertilised egg is called a _____.

5. Instructions and Twins

The sperm nucleus and the egg nucleus each contain _____ chromosomes. Chromosomes contain the _____ to make a new human. All eggs contain an _____ sex chromosomes. Sperm contains either an _____ or _____ sex chromosome. X sperm + X egg = _____ Y sperm + X egg = _____. If a fertilised egg splits in two the twins will be _____. If two eggs are each fertilised by different sperm then the twins will be _____ identical.

6. Pregnancy

After a few days the zygote becomes an _____. It attaches itself to the uterus and in the next 11 weeks its o_____ develop. It then becomes a _____ and spends the next 25 weeks g_____. During this time an organ called the p_____ grows on the uterus wall and allows food and



_____ to pass from the mother to the baby and waste products to pass the other way. During labour the cervix _____ and the baby is delivered _____ first.

1 Solar radiation

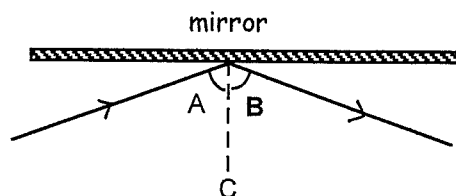
- The sun emits ___ types of radiation. The family of radiation we can see is called _____ light. The scientific name for heat is _____ radiation. The radiation which can cause skin cancer is called _____ radiation.

2 What is Light?

- White light is made from all the _____ in the rainbow joined together
- White light can be split up into all the colours of the rainbow by passing it through a _____. We call this rainbow the v_____ spectrum.
- The order of colours in the spectrum is Red, _____, Yellow, _____ blue, indigo and _____. Light travels in _____ lines.
- Light can travel through a _____ like space because it does not need _____.

3 Reflection

- When light hits a mirror it _____ off it.
- Look at this beam of light reflecting off a mirror. Name angle A and B and line C. The law of reflection is



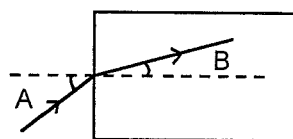
The angle of reflection = The angle of _____

A = angle of _____
 B = angle of _____
 Line C = _____

- Materials which let all light through are called _____.
 Materials which let some light through are called _____.
 materials which let no light through are called _____.

4 Refraction of Light

- Refraction happens when light changes _____ when it travels from one material into another.

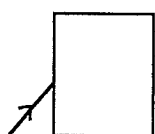


A - Angle of _____
 B - Angle of _____

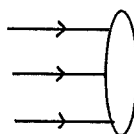
- Draw the path the beams of light take when they pass through each lens



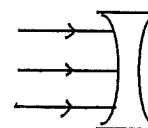
triangular prism



rectangular prism



convex lens

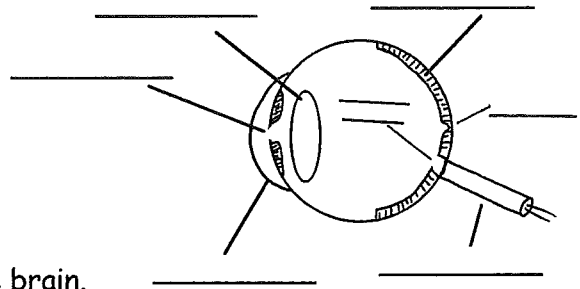


concave lens

3. A convex lens brings the light together. Point at which the light meets is called the _____ point. Distance between lens and image is the _____ length

5 The eye

Light enters the eye through a hole called the _____. The lens focusses the light onto the _____. The retina turns the light signal to an e_____ signal and the _____ nerve takes it to the brain.



6 Colour

1. A green filter lets through only _____ light
2. Red light + green light = _____. Red + blue = _____
green + blue = _____ Red + green + blue = _____
3. We see an object as a certain colour because the object _____ that colour back at us.

7. Heat Energy and Temperature

1. Temperature is a measure of how hot or _____ and object is. It is measured in _____. Heat is the total amount of energy all the _____ in a material have. Heat is measured in _____ or _____ for short.
2. Heat travels from _____ temperature places to _____ temperature places. The bigger the temperature difference between 2 places the _____ heat travels from one place to another.
3. Material which let heat pass through them are called _____. Materials which do not let heat pass through them are called _____. Materials such as _____ are conductors. Materials such as _____ and are insulators.
4. Heat travels through solids by _____ because the particles can easily _____ into each other and pass the heat along.
Heat travels through liquids and _____ by convection. In convection particles are heated, they become lighter and rise _____.
All warm objects give off invisible waves called Infrared _____. These waves do not need _____ to get from one place to another
5. The colour _____ is the best reflector of radiation
The colour _____ is the best emitter of radiation.
Heat loss can be reduced by (a) trapping hot air and preventing it m_____.
(b) By using i_____ material. (c) Using _____ colours

