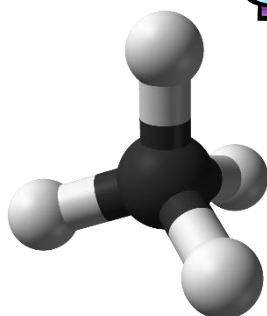
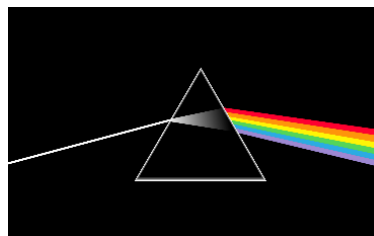


Braidhurst High School Science Department

S1

Homework Booklet



Atomic Number		Number of Electrons		Number of Protons		Number of Neutrons																													
1	H	1	1	1	0	1	1																												
2	He	2	2	2	2	2	2																												
Periodic Table		METALS		NON-METALS		GASES																													
3	Li	4	Be	5	B	6	C	7	N	8	O	9	F	10	Ne																				
11	Na	12	Mg	13	Al	14	Si	15	P	16	S	17	Cl	18	Ar																				
19	K	20	Ca	21	Sc	22	Ti	23	V	24	Cr	25	Mn	26	Fe	27	Co	28	Ni	29	Cu	30	Zn	31	Ga	32	Ge	33	As	34	Se	35	Br	36	Kr
37	Rb	38	Sr	39	Y	40	Zr	41	Nb	42	Mo	43	Tc	44	Ru	45	Rh	46	Pd	47	Ag	48	Cd	49	In	50	Sn	51	Sb	52	Te	53	I	54	Xe
55	Cs	56	Ba	57	La	58	Ce	59	Pr	60	Nd	61	Pm	62	Sm	63	Eu	64	Gd	65	Tb	66	Dy	67	Ho	68	Er	69	Tm	70	Yb	71	Lu		
87	Fr	88	Ra	89	Ac	90	Th	91	Pa	92	U	93	Np	94	Pu	95	Am	96	Cm	97	Bk	98	Cf	99	Es	100	Fm	101	Md	102	No	103	Lr		
104	Rf	105	Db	106	Sg	107	Bh	108	Hs	109	Mt	110	Ds	111	Rg	112	Uub	113	Uut	114	Uuq	115	Uup	116	Uuh	117	Uuo	118	Uuq	119	Uuh	120	Uuo		

Write the answers to these questions IN YOUR HOMEWORK JOTTER. Make sure you include the heading of the exercise you are doing.

Take good care of this booklet. It is NOT to be written on and must be returned to your teacher at the end of the year.

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Model of Matter 1: Solids, Liquids & Gases

1. Solids, liquids and gases are known as the three _____ of matter. What is the missing word?

For the next 4 questions, write either Solids, Liquids or Gases:

2. Which of the following have a **fixed shape**?

3. Which of the following have a **fixed volume**?

4. Which of the following can be poured?

5. Which of the following can spread out to fill any shape?

6. Do gases have any weight?

7. What weighs more? 100g of oxygen or 100g of steel?

Model of Matter 2: Particles in Solids, Liquids & Gases

1. Particles in a solid are able to **move** over each other. True or False?

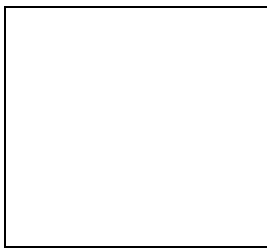
2. Copy and complete the following table and place the following substances under the correct heading:

Water, oxygen, air, wood, stone, shampoo, carbon dioxide, shower gel, steel.

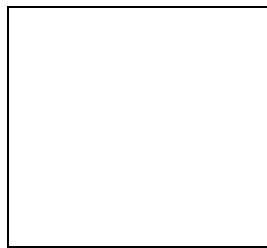
Solid	Liquid	Gas

- Do liquids have spaces between their particles? Yes or No?
- Adding 50 cm³ of alcohol to 50 cm³ of water gives a volume of **less** than 100cm³. Why?
- Draw the arrangements of particles in solids, liquids and gases in your jotter.

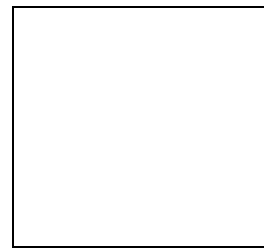
Solid



Liquid



Gas



Model of Matter 3: Changes of State

- What is the **boiling** point of water?
- What is the **melting** point of ice?
- What is the **freezing** point of water?
- What is **boiling**?
- Which process is the **reverse** of boiling?

6. In which (solids, liquids or gases) do the particles **move**?

Copy and complete the following sentences:

7. **Melting** is when a _____ changes into a _____.

8. **Freezing** is when a _____ changes into a _____.

Model of Matter 4: Expanding & Contracting

1. When **heated**, does a material expand or contract?
2. What happens to the particles when a material is **cooled**?
3. Why does a bimetallic strip bend when **heated**?

For the next 2 questions, answer one of the following:

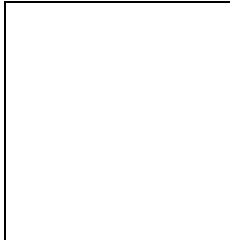
4°C 20°C 60°C all the same

4. At what temperature will a balloon have the **biggest** volume?
5. At what temperature will a steel ball have the **smallest** volume?

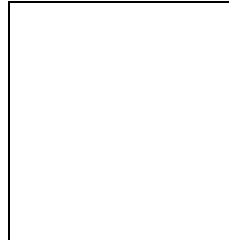
Model of Matter 5: Compressing

1. Which of the following (solids, liquids or gases) has the **largest** spaces between particles?
2. Can particles in a solid be pushed **closer** together?
3. Which state of matter can be compressed the most?
4. Why is this?
5. In your jotter, draw the arrangement of gas particles before and after compression. (you can add more particles if you want)

Before



After



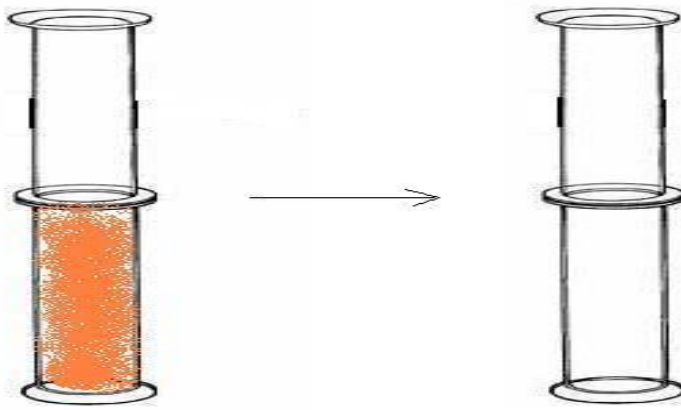
Model of Matter 6: Diffusion

Copy and complete the following sentence:

1. **Diffusion** is the _____ of particles to fill

2. In which of the following (solids, liquids or gases) do the particles have the **most** energy?

3. Do particles move faster or slower if they have a lot of energy?
4. In which state of matter is diffusion **slowest**?
5. Why is diffusion slowest in this state of matter?
6. Draw in your jotter what would happen when the lid is removed from between the gas jars shown.



Model of Matter 7: Uses of Solids, Liquids & Gases

1. (a) Which state of matter is used for building and supporting things?
(b) Why is this state of matter used for this?
2. Which state would be used to put something **into** a mould?
3. Copy and complete the following table and place the following things under the correct heading:

Fizzy drinks, building, paint, balloons, tyres, ketchup, perfumes, furnishing, drink

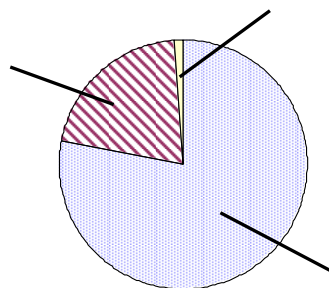
Use of Solid	Use of Liquid	Use of Gas

4. Sand can be poured into containers. Is sand a solid, liquid or gas?

Model of Matter 8: Gases of the Atmosphere and their uses

1. Air is a _____ of gases. (copy and complete)

2. Copy and label the following pie chart of the gases in the air.



3. Which gas in the atmosphere is used for freezing foods?

4. Which gas is used in fizzy drinks?

5. **Why** can argon be used to fill light bulbs?

6. Which gas is needed for breathing and burning?

7. How is nitrogen used to help **make** more food?

Model of Matter 9: The Water Cycle

1. In what direction does hot air move? Up or down?
2. What is the change of state involved in evaporation? (copy & complete)

evaporation
—————→

3. What is this change of state called?

gas —————→ liquid

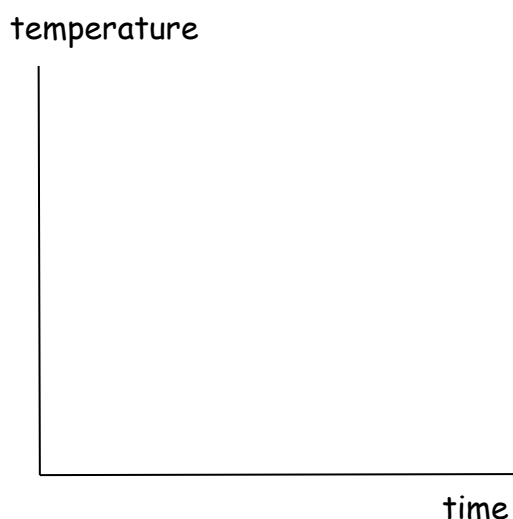
4. What causes condensation to happen?
5. (a) Name the two **solid** forms of precipitation.

(b) Describe how **solid** precipitation ends up back in the sea to start the water cycle all over again.

Model of Matter 10: Energy & Changing State

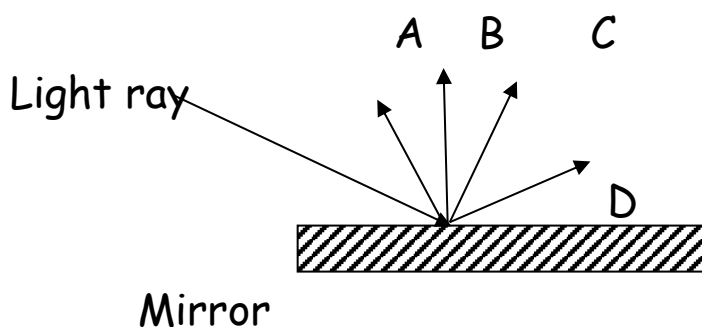
1. What is the highest temperature water can reach when being heated?
2. When water is changing from liquid to solid, does the temperature keep going down?
3. Is energy **used up** or **produced** by a substance when changing from a liquid to a gas?

4. Are bonds forming or being broken when a substance is changing from a solid to a liquid?
5. Copy and complete the axes below, and sketch the shape of the graph you would get as you cool cetyl alcohol, turning it from a liquid into a solid.



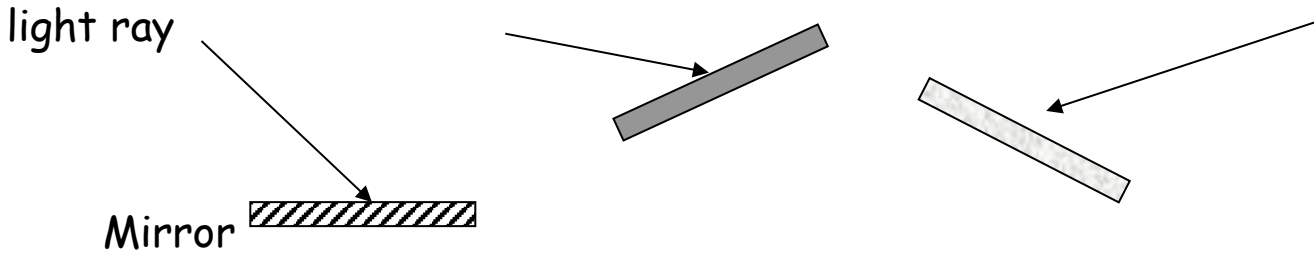
Light and Other Radiations 1: Light Reflection

1. What is meant by **reflection** of light?
2. Which ray (A, B, C or D) on the diagram below, shows the correct angle for the ray of light reflecting from the mirror?

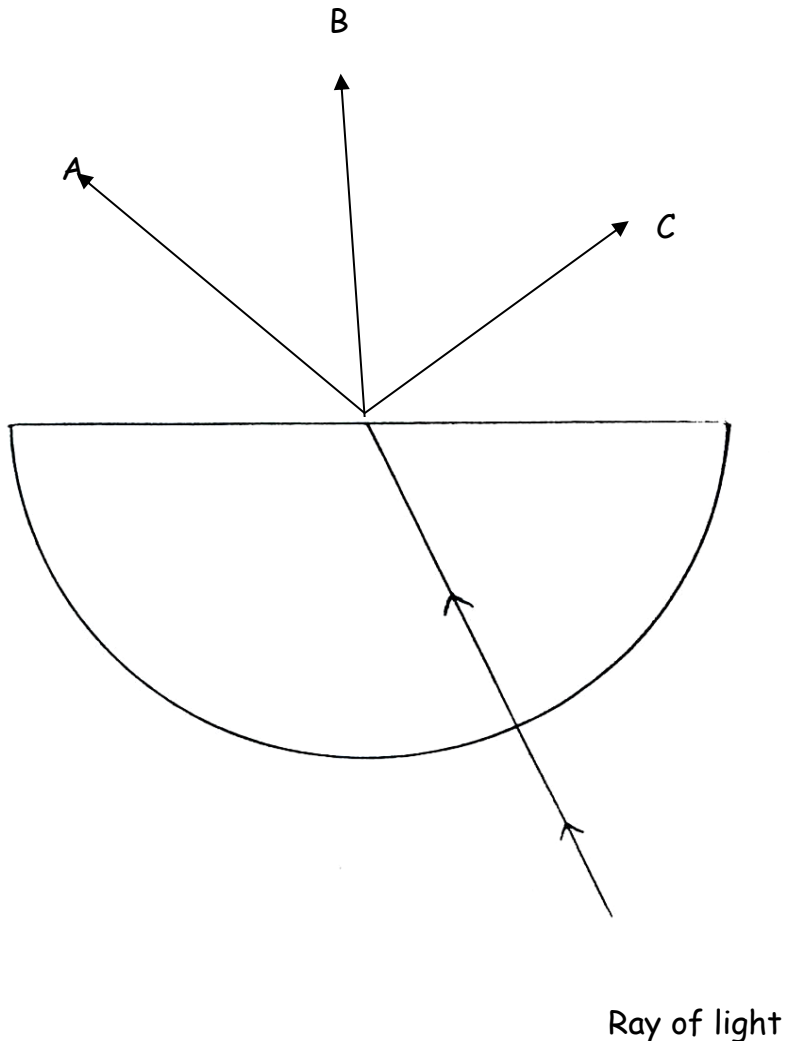


3. Explain what is meant by the normal?

4. Copy and complete the diagrams below and draw in the **normal**. Remember to use a ruler!

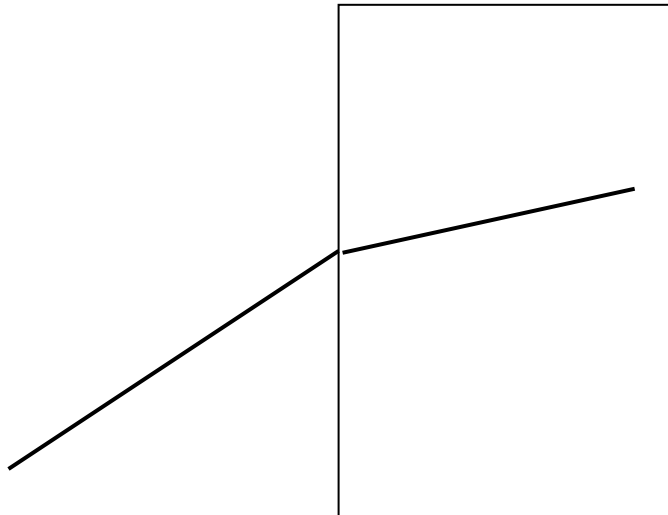


Light and Other Radiations 2: Refraction



1. Which line shows correct path that the ray of light takes after leaving the semi-circular block?

2. Copy and complete the diagram below:

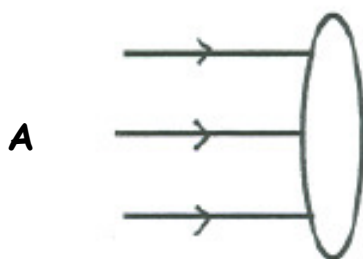


a Draw the normal on the diagram below.

b Label the angle of incidence (i) and refraction (r) on the diagram below.

Light and Other Radiations 3: Lenses

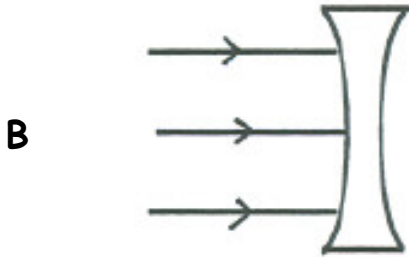
1. Look at the lens below.



a. What is the name of lens A?

- b. **Copy and complete the diagram above** showing what happens to the three rays of light when they pass through the lens. (You must use a ruler).

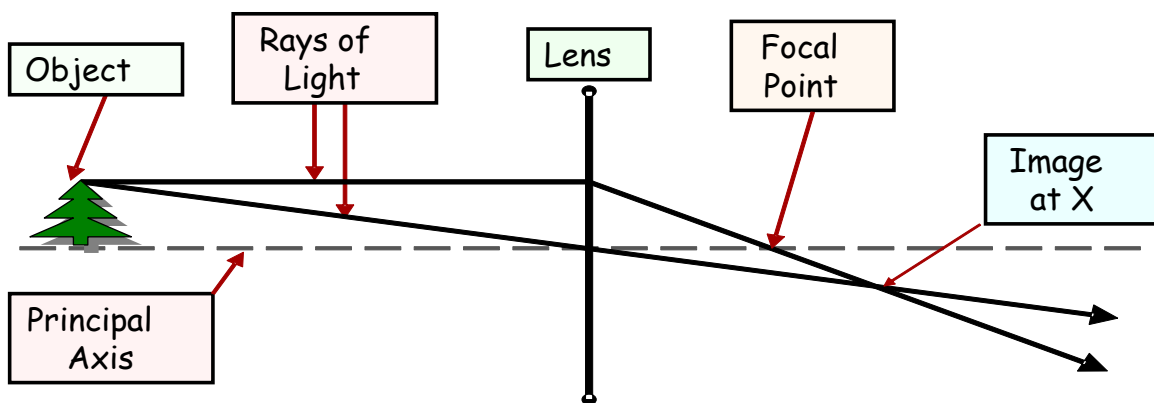
2. Look at the lens below.



- a. What is the name of lens B?
- b. **Copy and complete the diagram above** showing what happens to the three rays of light when they pass through the lens. (You must use a ruler).

3. List two applications (uses) of lenses in everyday life.

4. Look at the incomplete diagram below. Which box below shows the correct image formed at X?



A



B



C



D

5. **Copy and complete** the sentences below:

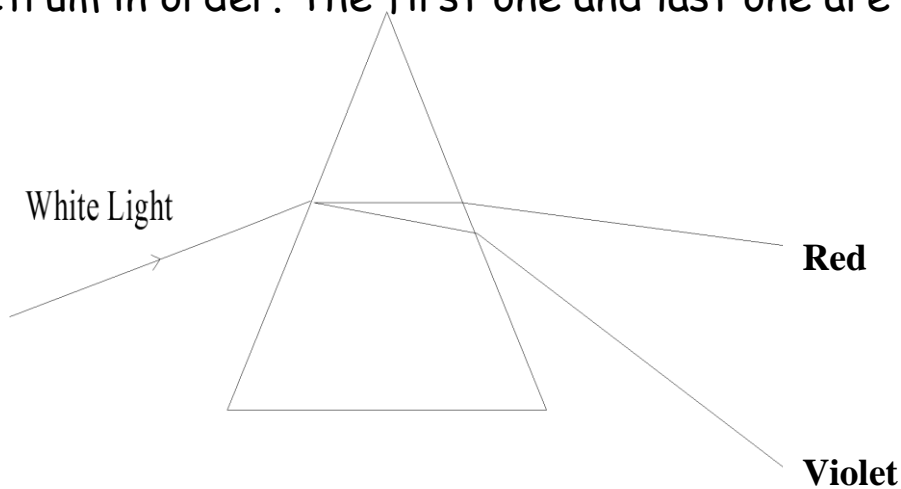
A convex lens causes light rays to _____ (come together).

A concave lens causes light rays to _____ (spread out).

Light and Other Radiations 4: Prisms & White Light

A prism can be used to refract white light, which is made up of a range of seven colours, called the visible spectrum.

1. **Copy and complete** the diagram below, putting the different colours of the visible spectrum in order. The first one and last one are done for you.



2. Take the first letter from each of the above colours and write them in order.

Light and Other Radiations 5: Filters

1. Write down the three primary colours of light.
2. A pupil decides to mix different colours of light to see what happens. The pupil makes sure that the experiment is fair by only mixing the same brightness of light.

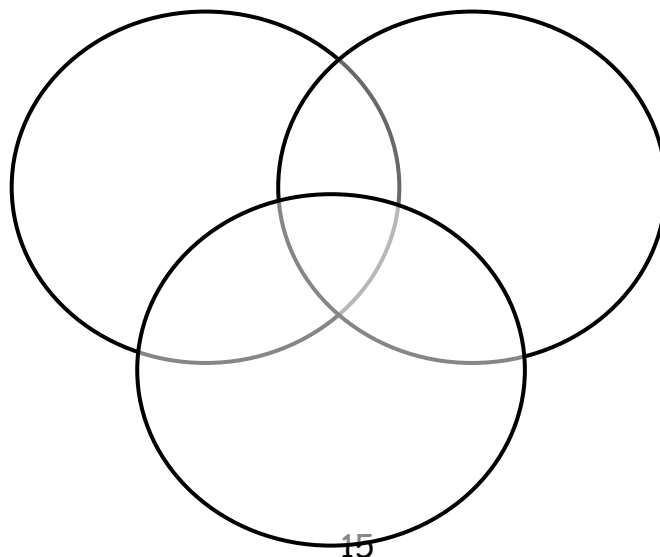
Write down the correct colours made when she attempted her experiment.

Mixing red and green light makes _____.

Mixing green and blue light makes _____.

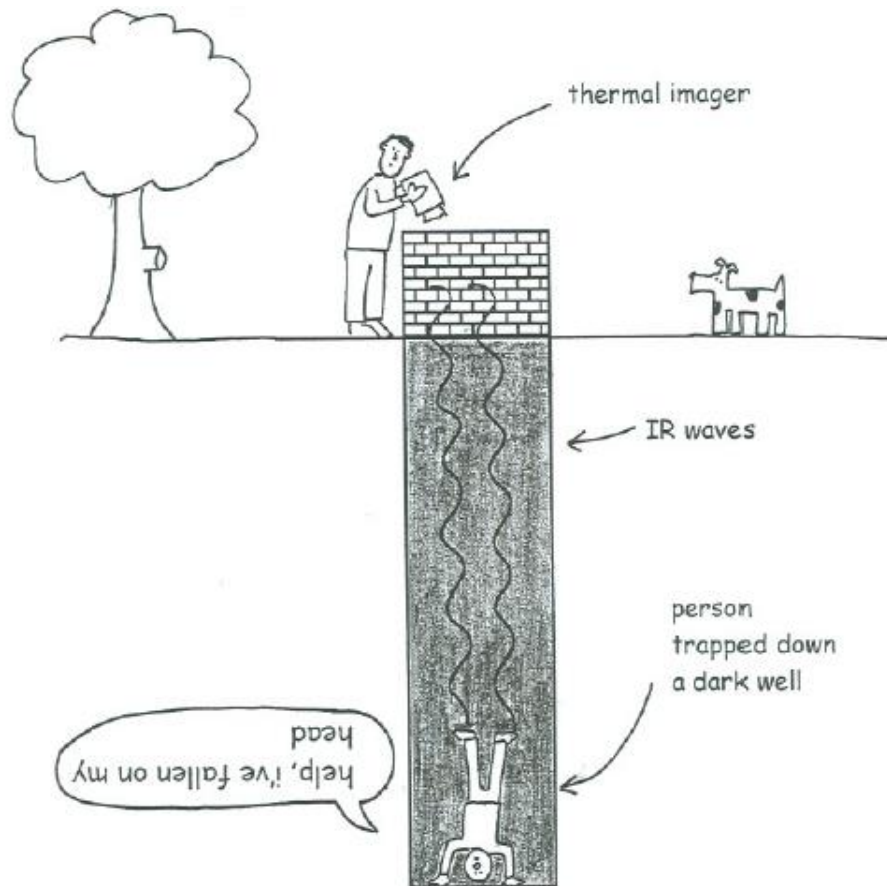
Mixing red and blue light makes _____.

3. What is the name given to the product of mixing two primary colours?
4. Copy the diagram below into your jotter, and if you have them, use coloured pencils/pens to fill in the diagram showing what happens when you mix the primary colours of light. **If you do not** have coloured pens or pencils, put the first letter of the colour in the correct part of the diagram e.g. for RED you would put R.



Light and Other Radiations 6: Infrared & Ultraviolet

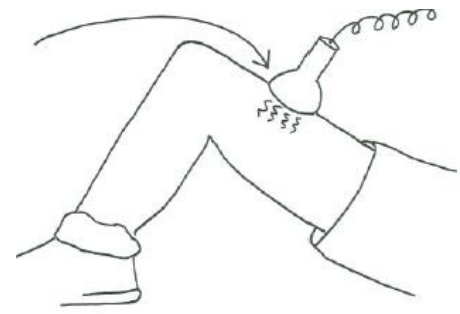
1. Copy and complete the sentences below.



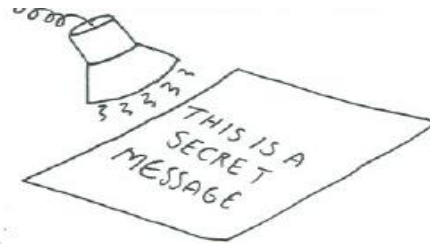
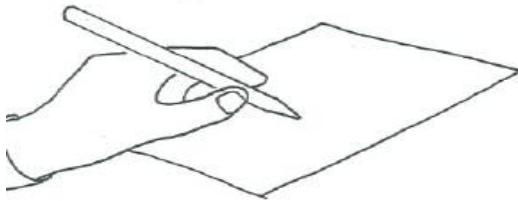
If a person is trapped down a dark well, they can be found by using a special camera that produces a heat image (photograph) called a _____ .

This image is produced because the person gives off _____ **radiation**.

2. Paul has injured his leg at football training before the cup final. How can his manager speed up his recovery? Write a sentence on how the lamp can help him. Remember to state what type of radiation the lamp uses.



Copy and complete the following sentences.



3. By using an _____ lamp you can see the secret message.

This type of radiation can also be used to treat teenagers with _____.



After a few weeks - sorted



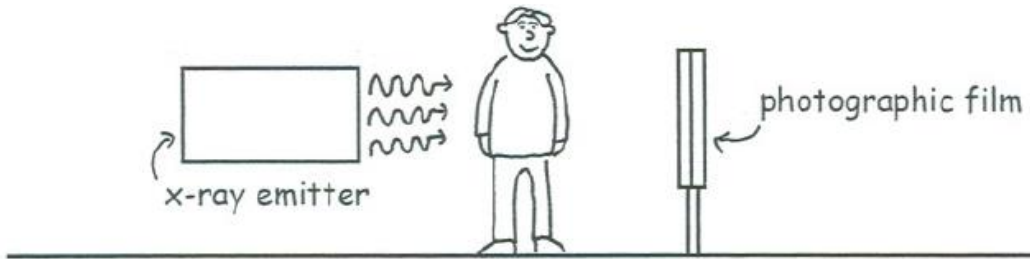
4. The Sun gives off _____ radiation.

5. Too much of this radiation can cause _____ cancer.

6. To protect yourself from this type radiation you should use _____ cream.

Light and Other Radiations 7: X-rays

1. The image below shows a man having an X-ray.



Copy and complete the following sentences.

X-rays can be used to obtain a picture of

_____ inside the person's body. The person

stands between the x-ray _____ and the

_____ film. The x-rays which pass through the

body hit the photographic film and cause it to turn

_____.

The x-rays which hit _____

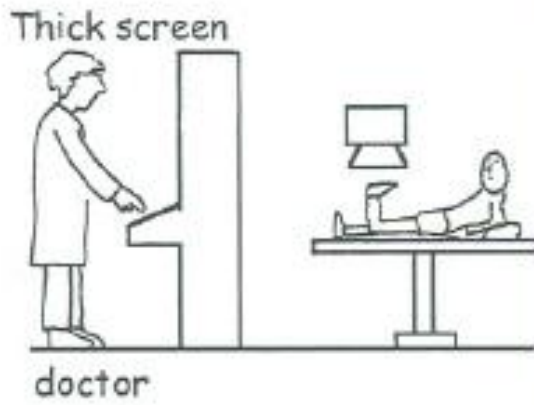
are absorbed. These x-rays do not hit the film so the film stays _____.

2. The statements in the grid below are related to different types of radiations.

1 Used to take pictures of bones	2 Used to cure acne	3 Used to follow blood flow around the body
4 Are shown on pictures called thermograms	5 Can be used to kill cancer cells	6 Cause fluorescent chemicals to glow

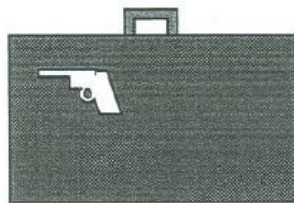
Which two statements describe facts about x-rays?

3. The doctor is taking an x-ray of a patient's suspected broken leg.



Explain why the doctor is standing behind a thick screen?

4. Here is an x-ray of a suitcase taken at an airport.

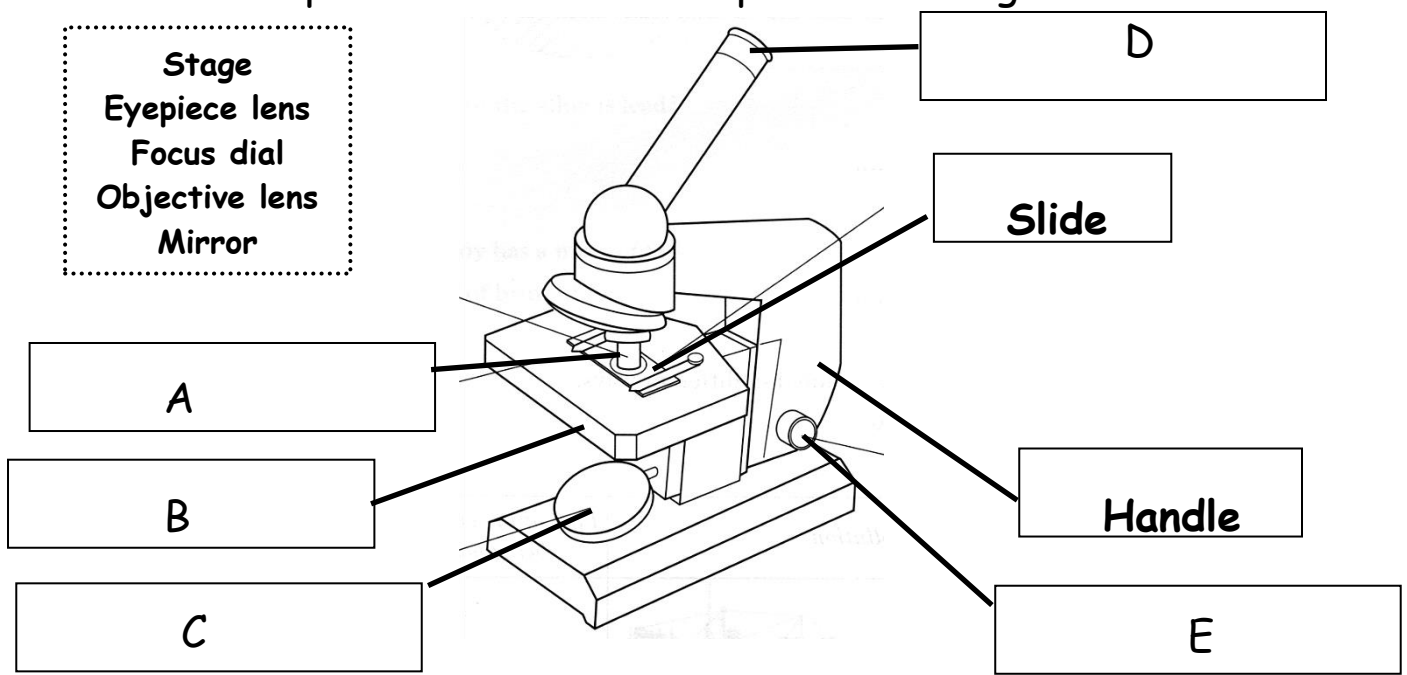


Why is only the gun detected in the x-ray and not the persons clothes?

Cells 1: Structure and Function of Cells

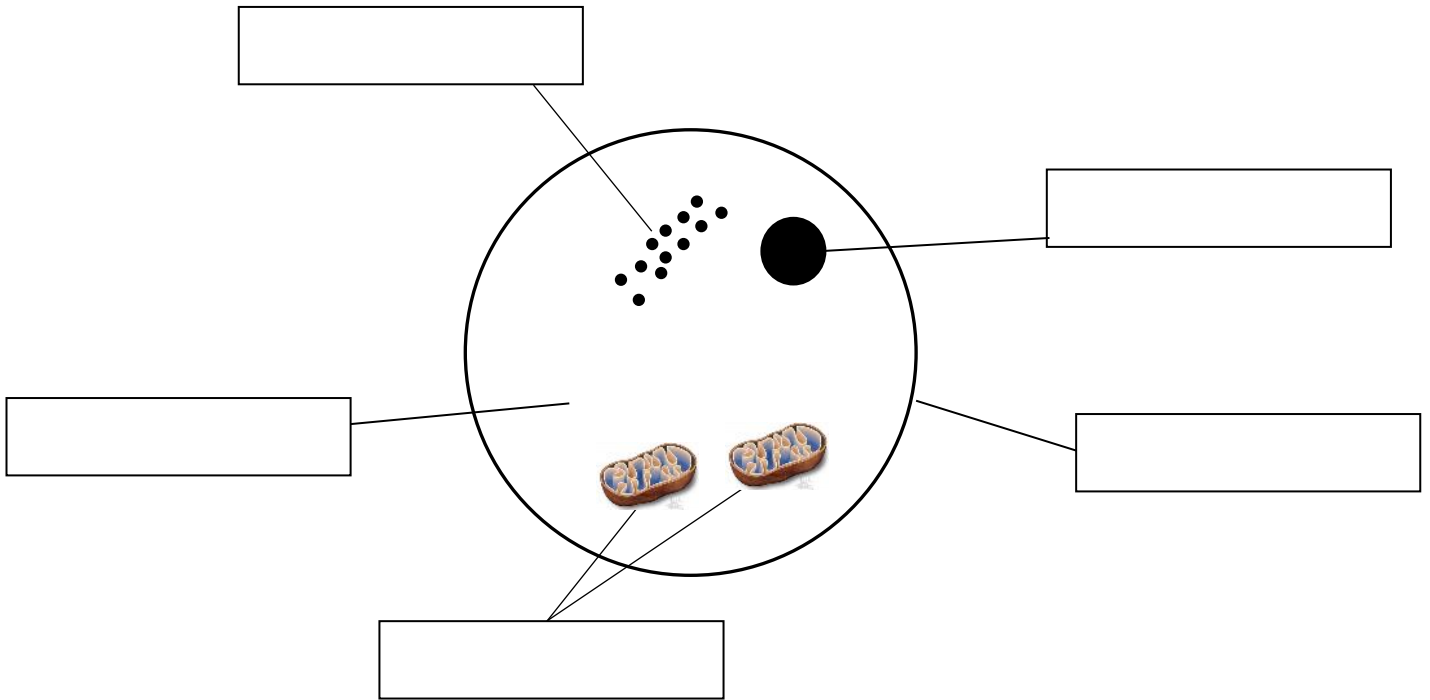
1. Label the parts of the microscope below using the word box.

- Stage
- Eyepiece lens
- Focus dial
- Objective lens
- Mirror



2. Why are cells sometimes stained before they are placed underneath a microscope?

3. a. Copy and label the diagram of an animal cell below:



b. Name the three extra structures found in plant cells.

4. Cells have many different structures which have their own function. Copy and complete the table below by inserting the names of the missing parts and their functions.

Part of cell	Function
Nucleus	
Cytoplasm	Site of chemical reactions in the cell
Cell membrane	
	Gives cell shape and support
	Contains liquid called sap
Chloroplasts	Contain chlorophyll used in photosynthesis
Mitochondria	
	Site of protein synthesis

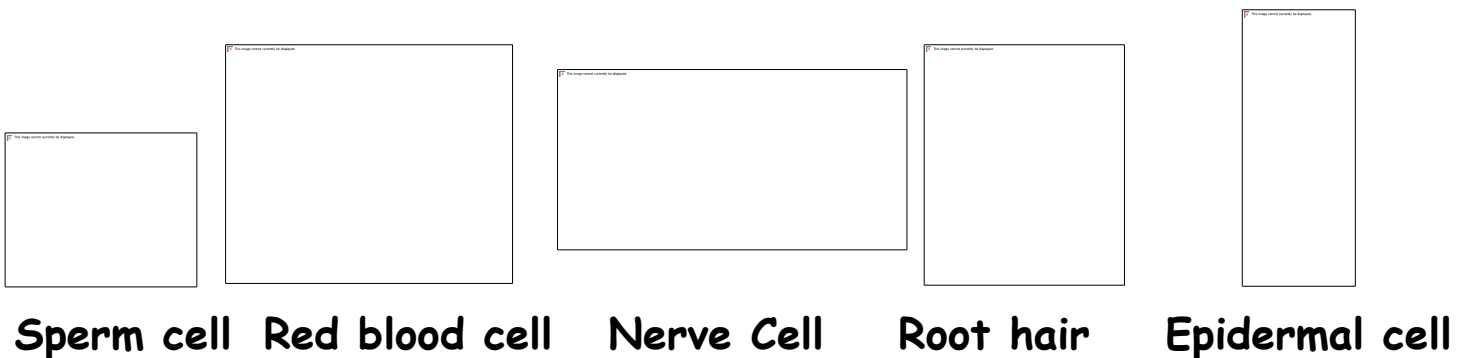
Cells 2: Cell Adaptation Related to Function

1. Why do plants and animals have lots of different cells and not just the one kind?
2. Use letters from the grid below to answer the following questions.
- 3.

A. cells	B. tissues	C. organism
D. muscle	E. root	F. organs

- a. When tissues join together they form _____.
 - b. When similar cells are grouped together they _____.
 - c. _____ is an example of a plant tissue.
 - d. _____ is an example of an animal tissue.
4. Different cells are adapted to suit their function.

Look at the diagrams of specialised cells below.



Choose one of the above cells, describe its specialised structure and the function it performs.

Cells 3: Different Microorganisms

1. Name the three main types of microbe.
2. All microbes are microscopic. Copy and complete the sentence below to give one other feature common to all microbes

They have a _____ rate of reproduction.

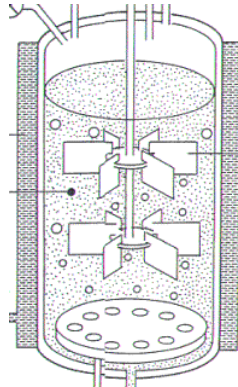
3. Yeast and mould are both types of fungi.
Copy and complete the table below then add 4 lines to show the correct description and means of reproduction used by yeast and mould.

Type of Fungi	Description / Reproduction method
Yeast	Thread like structure
	Budding
Mould	Circular shape
	Spores

4. Bacterial cells reproduce by dividing into two identical daughter cells.
If a bacterial cell divides every 20 minutes, how many cells would there be after two hours?
Remember there are 60 minutes in an hour.

Cells 4: Controlling Microbe Growth

1. To culture large quantities of microbes we can use a fermenter like the one below.

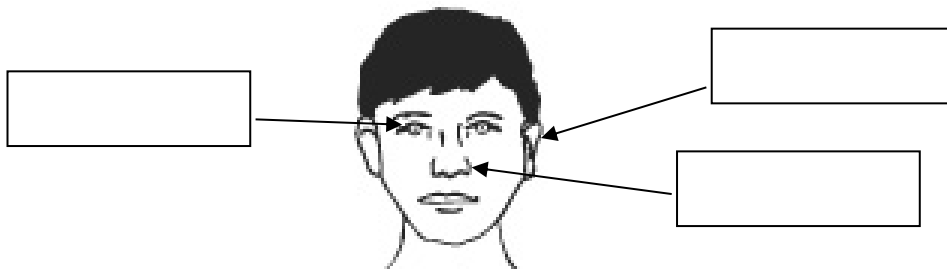


- Name two conditions, which must be maintained, for microbes to grow as quickly as possible in a fermenter.
2. What term is used to describe the spread of unwanted microbes?
 3. List two precautions, which should be taken to avoid the spread of unwanted microbes in a laboratory?
 4. After being placed in the appropriate biohazard bag which other step must be performed before streak plates can be disposed of safely?

Cells 5: Defence Mechanisms

1. Since viruses are non living, what do they require for successful reproduction?

2. a. If microbes enter the body they may cause disease. Copy and complete the diagram below by stating the **substance produced** in each of the areas which acts as the first lines of defence.



- b. Name the first line of defence not labelled in the diagram above. (clue - it is the biggest organ of your body)

3. a. Sometimes people, particularly children go to the doctors to have an altered form of a virus injected into their blood stream. What term is used to describe the procedure they have undergone?

- b. Why is a good idea to have this type of treatment?

4. Antibiotics are only effective against which type of microbes?

Periodic Table & Chemical Reactions 1

1. The simplest type of substance we know is called an _____.
2. A column in the Periodic Table is known as a _____.
3. A row in the Periodic Table is known as a _____.
4. How many types of atom can be found in an element?
5. Name the only metal which is liquid at room temperature.
6. Name the only non-metal which is liquid at room temperature.
7. Copy and complete the table below and place the following elements under the correct heading in the table:

sodium, aluminium, oxygen, gold, chlorine, argon.

Solid	Gas

Periodic Table & Chemical Reactions 2

1. Elements can easily be classified as metals and _____-_____.
2. Write all the statements below which are true of metal elements:
They are insulators of heat. They all conduct electricity.
They are shiny when polished. They conduct heat.
They are all solids. They are soluble in water.
3. Solid non-metals are usually brittle. What does brittle mean?
4. Non-metal elements can exist in which physical states? (write the correct answers)
 Solid Liquid Gas Solution
5. Which group are there more of? Metals or non-metals?
6. Which are better conductors of heat and electricity? Metals or non-metals?
7. Which tend to have the higher melting and boiling points? Metals or non-metals?

Periodic Table & Chemical Reactions 3

1. The elements are arranged in the Periodic Table in order of increasing _____ number.
2. As well as a name, each element has its own chemical _____.
3. How many capital letters are found in each symbol?
4. There are 8 groups in the Periodic Table. Are these the rows or columns?
5. In which group are the Alkali metals found?
6. Use the Periodic Table in your diary to copy and complete the following table:

Name	Symbol	Atomic Number
Helium	He	2
Bromine	Br	
Aluminium		
	Na	
		6
Oxygen		

Periodic Table & Chemical Reactions 4

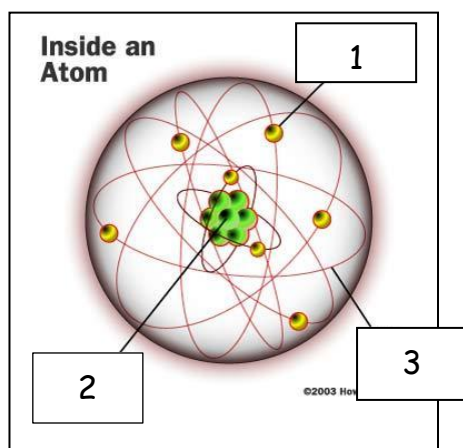
1. Copy and complete the table below with the names and properties of the 3 particles which are found inside atoms:

Particle name	Mass (a.m.u.)	Charge
		+1
Neutron		
	0	

2. What is the centre of the atom called?

3. Which particles are found here?

4. Which number points to an electron?



5. The number of protons is indicated by which number?

Atomic number

Mass number

Periodic Table & Chemical Reactions 5

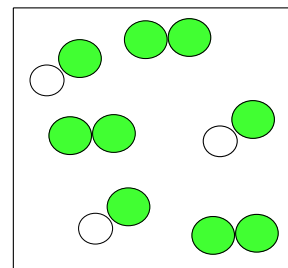
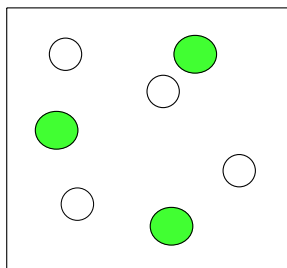
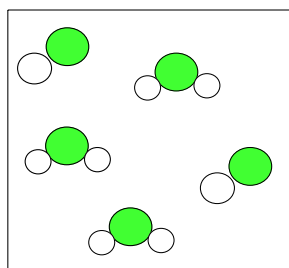
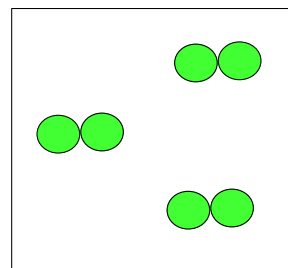
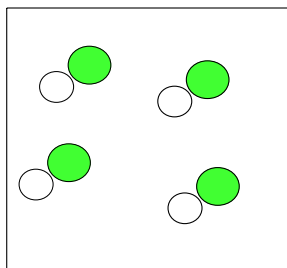
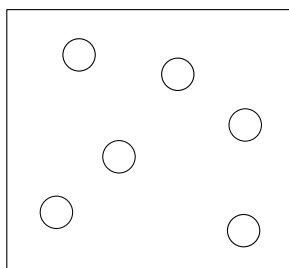
1. Elements in the same group have the same _____ properties.
2. The group number is equal to the number of _____ of each element in that group.
3. What gas is produced when metals react with water or acid?
4. The most reactive metals are found in which group?
5. What property do all the gases in group 8 have in common?
6. Copy and complete the table below with the names of the groups of elements:

Group number	Name
1	
7	
8	

Periodic Table & Chemical Reactions 6

1. A _____ is a chemical with two or more elements joined together.
2. An insoluble solid can be separated from a liquid by _____.
3. Electrolysis can be used to break down a compound into its _____.
4. A soluble solid can be separated from a liquid by _____.
5. Draw each of the pictures below, and write a description using one of the following phrases:

an element, a compound, a mixture of elements, a mixture of an element and a compound, a mixture of compounds.



Periodic Table & Chemical Reactions 7

1. What are always listed on the right hand side of the arrow in a word equation?

2. Write down the reactants in the following word equation:



3. Write the word equations for the following reactions:

a) Sodium chloride, a white solid, is formed when sodium metal reacts with the green gas, chlorine.

b) When potassium is added to water hydrogen gas is given off and potassium hydroxide is also formed.

c) Sulphur burns in oxygen making sulphur dioxide.

d) Hydrochloric acid reacts with sodium hydroxide to make water and sodium chloride.

Periodic Table & Chemical Reactions 8

1. When something burns, what gas is it reacting with?
2. Use the words in the box below to copy and complete the sentences below and describe ways of identifying a chemical change has taken place:

a) a change of _____.

b) a _____ is given off.

c) a _____ is formed.

gas	appearance	solid
-----	------------	-------

3. Copy the table and list all the reactants and products in the following reactions:

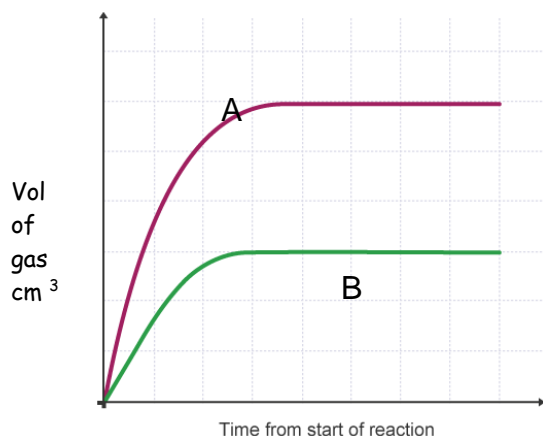
a) Magnesium metal burns in oxygen to produce the white powder magnesium oxide.

b) When zinc is added to hydrochloric acid, hydrogen gas is formed along with zinc chloride.

Reactants	Products

Periodic Table & Chemical Reactions 9

1. What do we mean by the rate of a reaction?
2. What would happen to the reaction rate if we lowered the temperature of the reactants?
3. Apart from changing the temperature, give 2 other ways of **increasing** the rate of a reaction.
 1. _____ the concentration
 2. adding a _____
4. Explain how decreasing the particle size affects the rate of a reaction.
5. Here is a graph of a reaction carried out under 2 sets of conditions.



Which reaction is faster? A or B?

Periodic Table & Chemical Reactions 10

1. What is it called when a molecules sticks onto the surface of a catalyst?
2. In an experiment, Jimmy adds 1g of a catalyst, manganese dioxide, to 50cm³ of hydrogen peroxide. He collects 200cm³ of gas. What weight of manganese dioxide is left in his flask? Explain your answer.
3. Why are catalytic converters fitted to cars?
4. Which enzyme is present in our saliva and breaks starch down into smaller sugar molecules?
5. Temperature affects how well an enzyme works. What other factor affects the activity of an enzyme?
6. The temperature at which an enzyme works best is known as the _____ temperature.
7. What word describes an enzyme which is no longer able to work due to high temperature or extreme pH?

Dear Parent / Guardian,

Homework is an important part of your child's education in science.

It helps improve understanding of the topics covered, as well as preparing them for assessments.

It also allows you to engage with your child and see what work they are covering in class.

The science department would really appreciate your support in ensuring your child completes homework to the best of his/her abilities.

Please sign homework exercises to confirm you have seen the work is complete.

Feel free to write any comments or questions in the jotter too.

Thank you,

The Science Department
Braidhurst High School