

NAME:	SCIENCE TEACHER:	9B
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SCIENCE

Year 9 Examination 2008

9B – 80 marks

Make sure that you have answered all the questions in this paper before you start paper 9A or 9C

Time allowed for both examinations: 2 hours

Answer all questions in the spaces provided on the paper.

You may use a calculator.

Show all your working in calculations; marks are awarded for it.

Give units for all answers (eg kg or m) unless they are already provided.

For Teacher Use

<i>Question</i>	1	2	3	4	5	6	7	8	9	10	<i>Total</i>
<i>Marks gained</i>											
<i>Marks available</i>	11	6	13	4	5	6	7	11	8	9	80

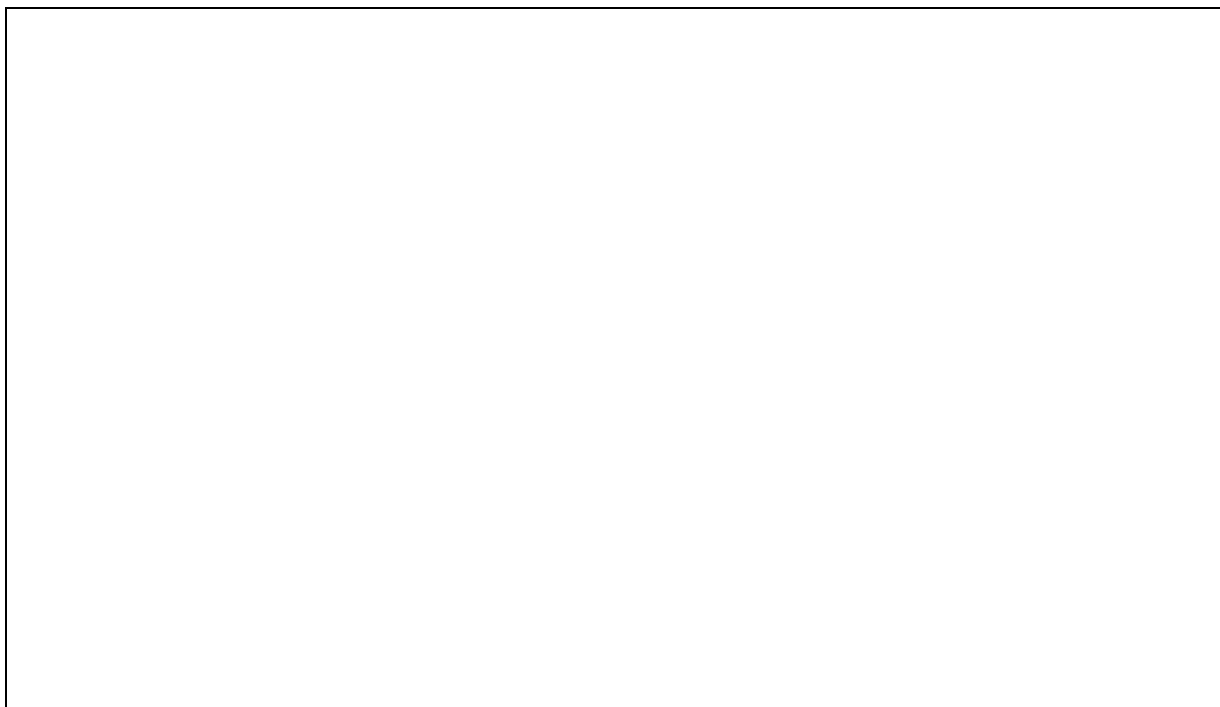
Question ONE: Skills

In Science we use many pieces of scientific equipment.

- a. Draw the correct 2D symbol used to represent the following equipment.

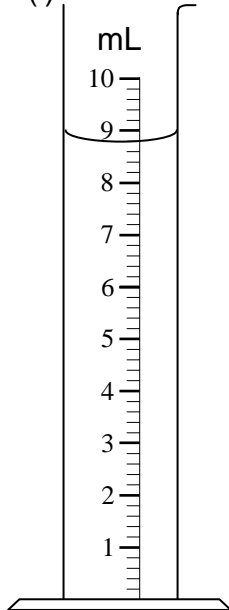
a. Test tube	b. Conical flask	c. Tripod
d. Gauze mat	e. Bunsen burner	f. Beaker

- b. Draw using the correct scientific symbols, a diagram to show how you would heat a beaker of water. Don't forget to include labels.



c. We often use measuring equipment in Science. Name the following pieces of equipment, read their scales and say what they are used to measure.

(i)

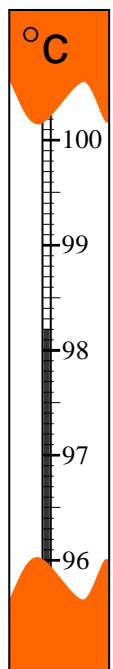


Equipment Name: _____

Reading and unit: _____ (_____)

What it measures: _____

(ii)

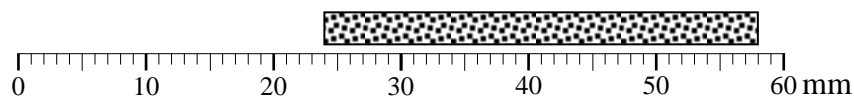


Equipment Name: _____

Reading and unit: _____ (_____)



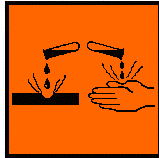



What it measures: _____

(iii)



Equipment Name: _____ Reading: _____ (_____) What it measures: _____

d. Look at the following hazard warning symbols A to F.

A	B	C	D	E	F
					

(i) Complete the following table using the letters A to F to show what symbol should be used. (One wont be needed)

a corrosive substance	a highly flammable substance	a toxic substance	a substance which is harmful	a substance which is an irritant

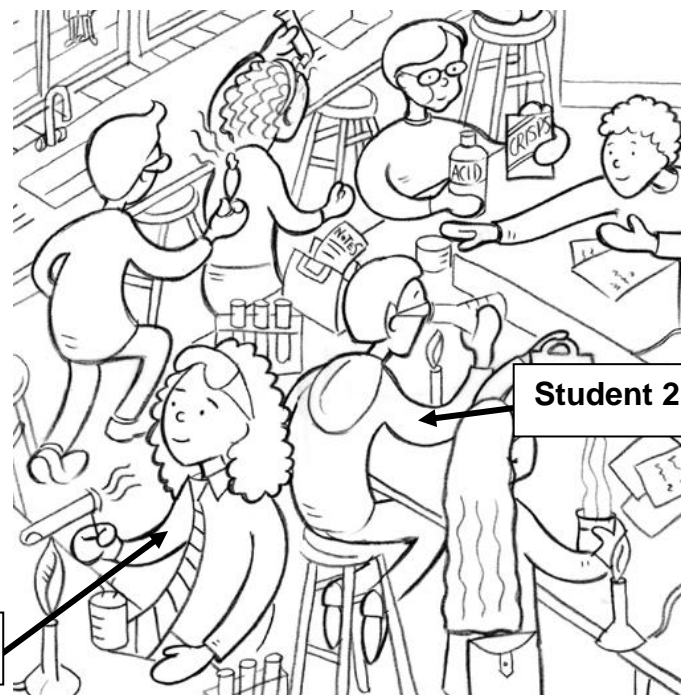
(ii) Which of the hazard symbols (from those shown previously) would be found on the following materials? (use the letters A to F)

- concentrated sulfuric acid _____
- petrol _____
- rat poison _____

e. Here is a cartoon of students working in an unsafe laboratory. For students 1 and 2 write down ONE thing each is doing wrong and explain why it is dangerous.

What Student 1 is doing wrong:
This is unsafe because ...

Student 1



Student 2

What Student 2 is doing wrong:
This is unsafe because ...

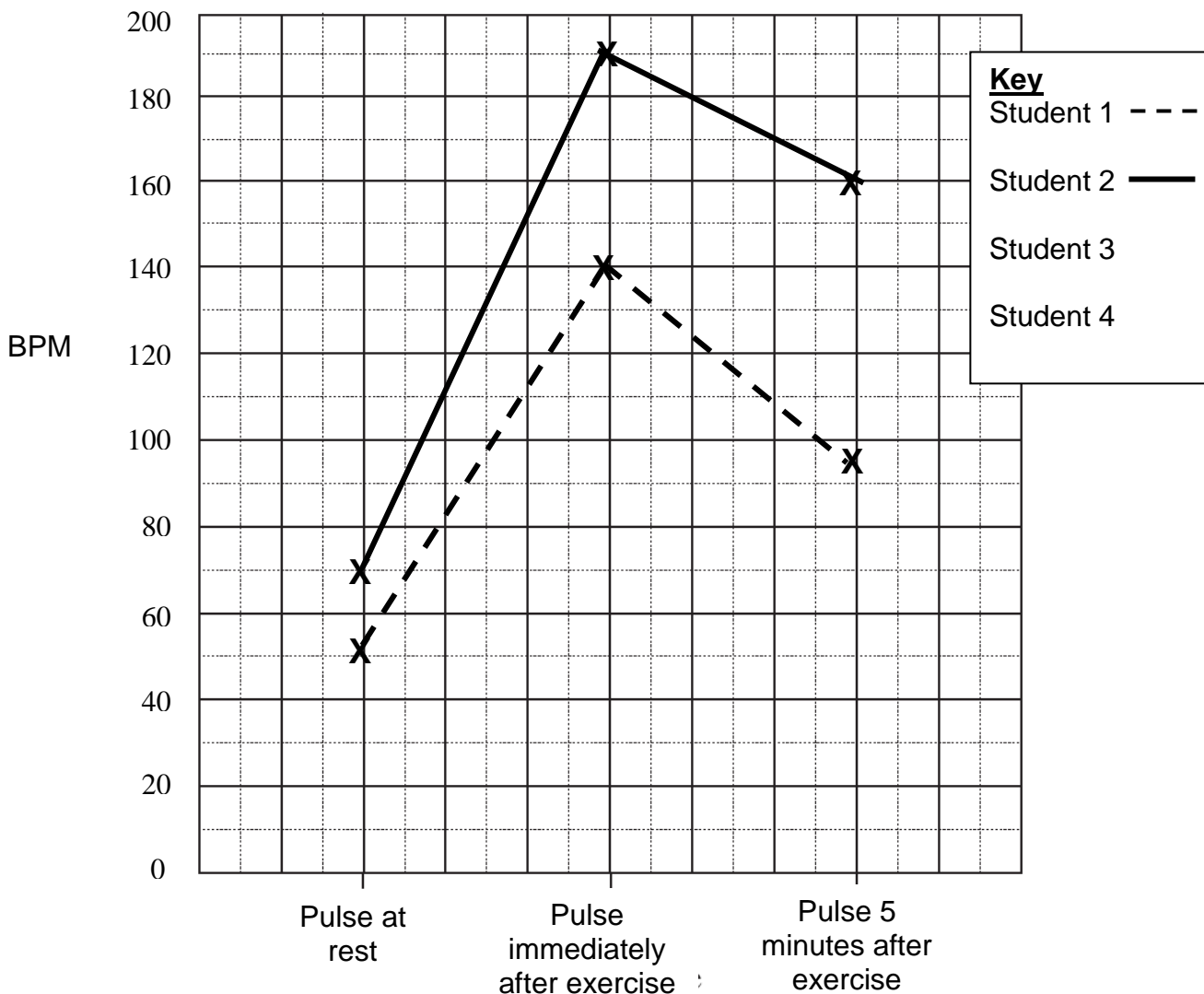
Question TWO: Graphs

Some students were asked to plan and perform an investigation to determine the time it takes for the pulse to return to its resting rate after exercise. Pulse rate is measured in beats per minute (bpm).

After completing their experiment, the students produced the following results table.

Student	Pulse at rest before exercise (bpm)	Pulse immediately after exercise (bpm)	Pulse 5 minutes after exercise (bpm)
1	50	140	95
2	70	190	160
3	70	130	80
4	80	90	80

a. Using the grid, complete the graph for students 3 and 4. Don't forget to complete the key.

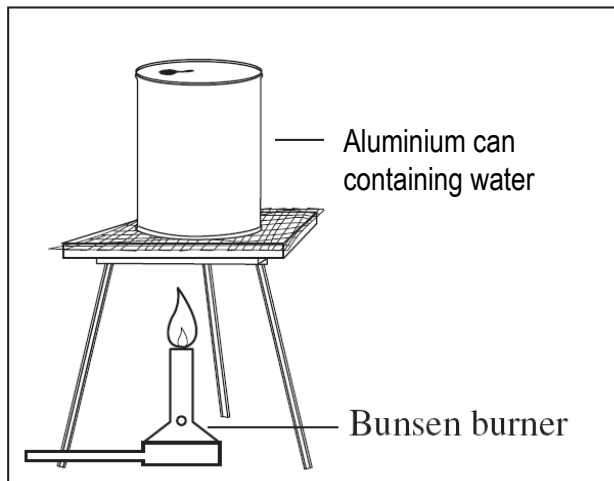


b. Explain how the students would have carried out this investigation.

Question THREE: Particles

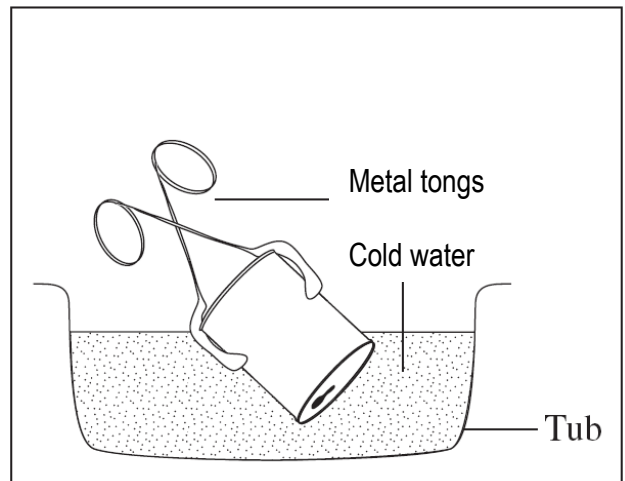
Below is a student's description of an investigation carried out to demonstrate the effect of differences in air pressure.

Figure 1



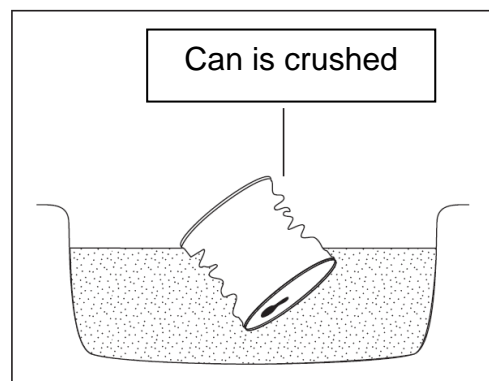
Aluminium can with water was heated over a Bunsen burner until the water boiled.

Figure 2



The can was then submerged in a tub of cold water.

Results

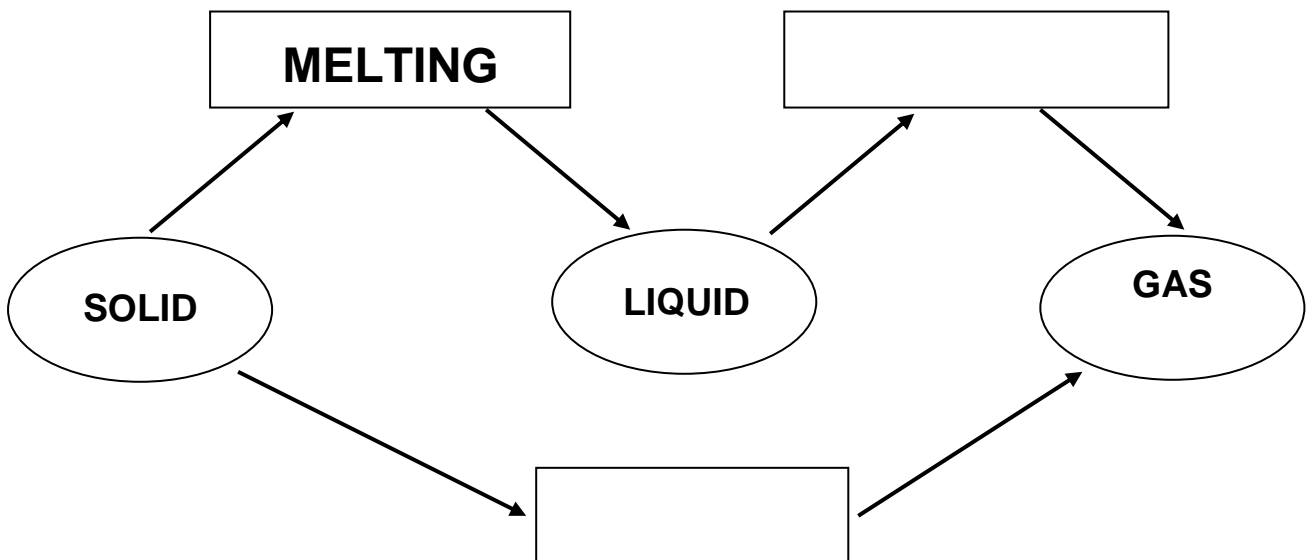


a. Explain why the aluminium can is crushed.

b. Complete the diagrams below to show what the particles look like in the water (liquid) and the water vapour (gas). Use ○ to represent the particles.

Water (liquid)	Water vapour (gas)

c. The following chart shows changes of state. Write the names of the missing changes of state in the empty boxes provided.



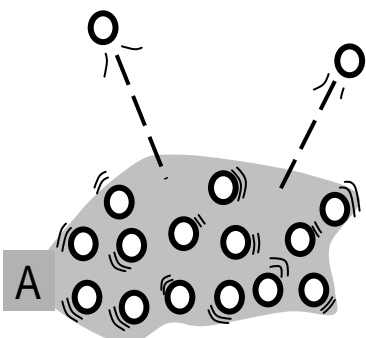
- d. Use the phrases in the box below to complete each sentences. Note each sentence requires TWO phrases to complete. You may use a phrase more than once.

Words to use			
move closer together	move further apart	move faster	slow down

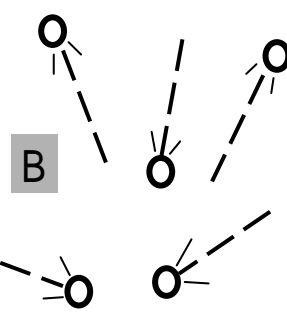
- i. When a solid turns to a liquid, the particles _____
and _____.
- ii. When a gas turns to a liquid the particles _____
and _____.
- iii. When a liquid turns to a solid the particles _____
and _____.

- e. Which THREE pictures below (in correct order) show water turning into gas (evaporation)

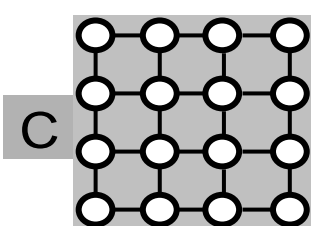
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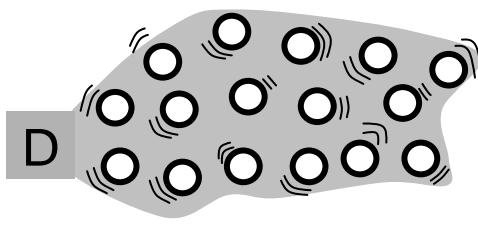
A



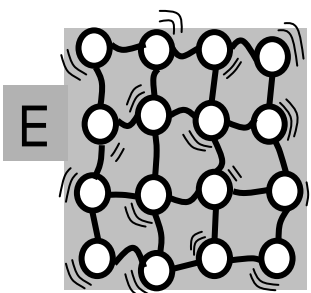
B



C

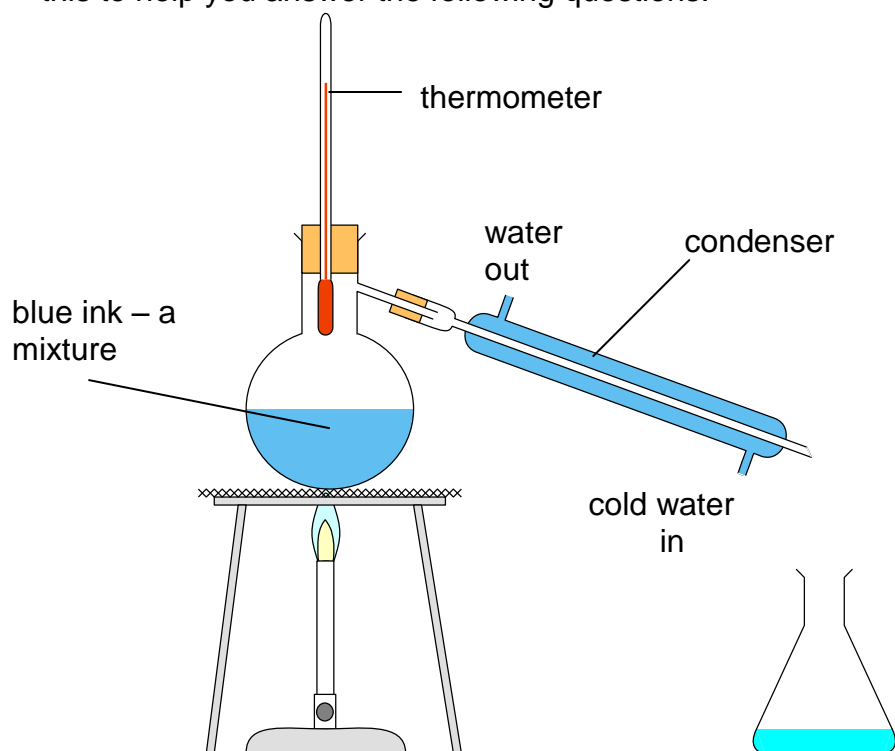


D



E

- f. Below is a picture of some equipment used to separate a mixture of ink and water. Use this to help you answer the following questions.

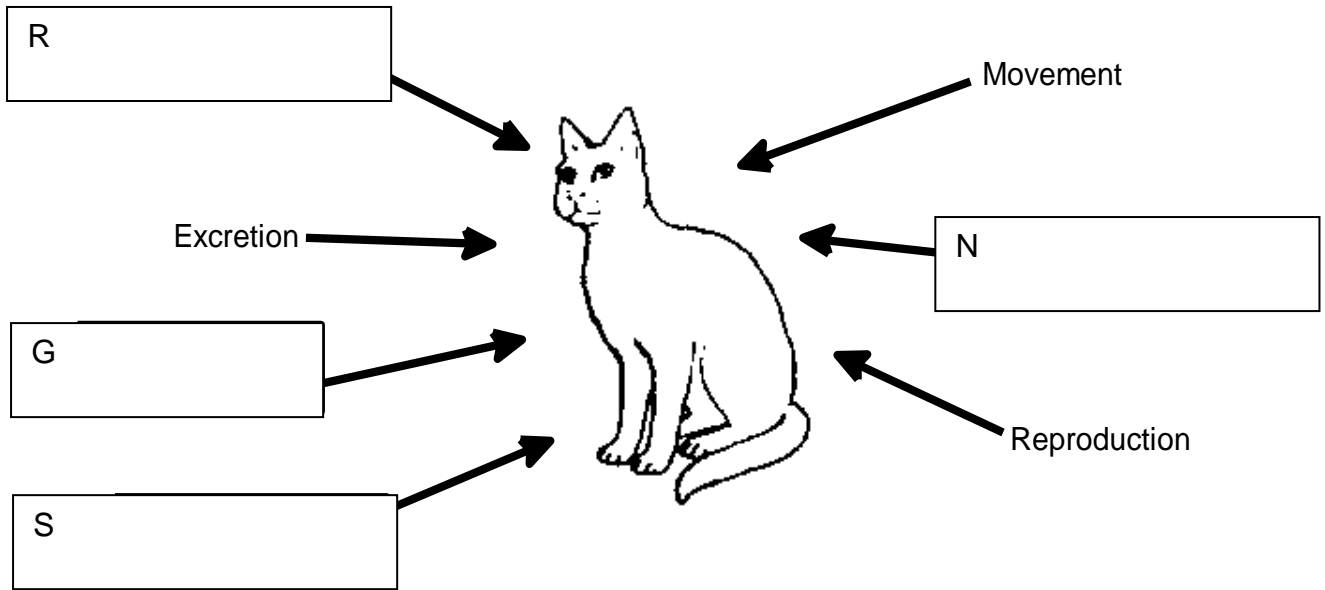


- i. This method of separation is called _____
- ii. Describe the function of the condenser in the diagram above.

- iii. Discuss how this equipment is able to separate a mixture of ink and water.

Question FOUR: Living or not!

a. Fill in the boxes to show the seven characteristics displayed by **all** living things.



b. Sort the following list into groups of living and non-living.

snake	computer	oak tree	clock
spider	grass	rock	worm
toilet	human	whale	car

LIVING	NON-LIVING

c. Explain why a fire is classified as non-living.



Question FIVE: Cells

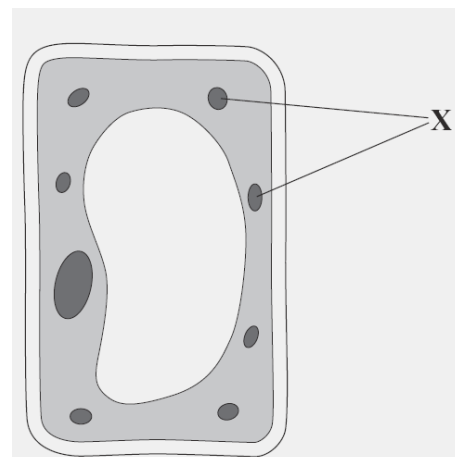
a. Photosynthesis occurs inside the structures labelled X.

Plant Cell

i. Name these structures: _____

ii. Apart from structure **X**, name **two** other structures you can see in the diagram which are **not** present in an animal cell.


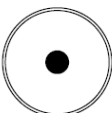
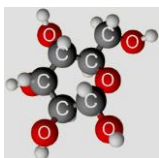
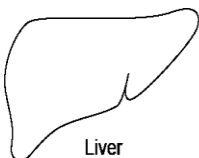

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iii. What **THREE** things are needed by the plant cell for photosynthesis to occur?

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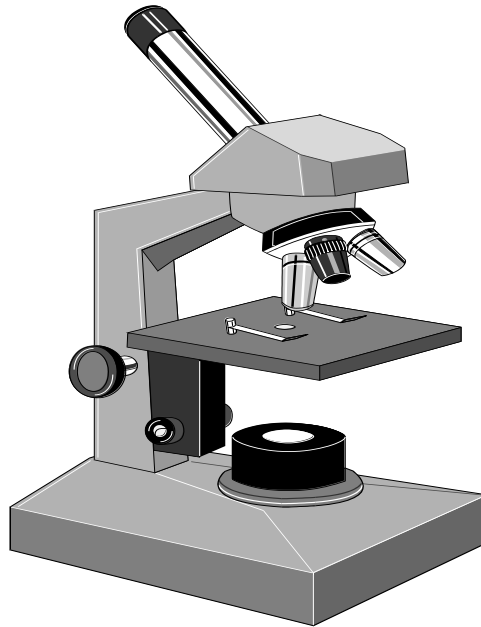
b. Rearrange the following items in order of size, starting with the **smallest**. Note that the drawings are not to scale:

Cheek cell 	Human egg cell 	 Sugar molecule	 Liver	 Nucleus
A	B	C	D	E

Smallest				Largest
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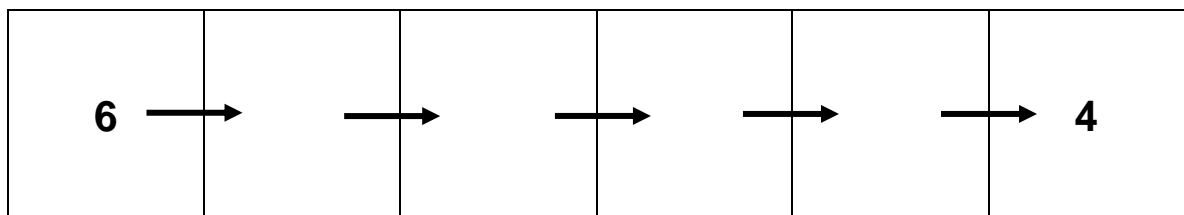
c. Label the following parts on the microscope below.

stage	light	eyepiece lens	coarse focus knob
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d. Put statements 1 to 6 into correct order to explain how to use a microscope. Some have been done to help you

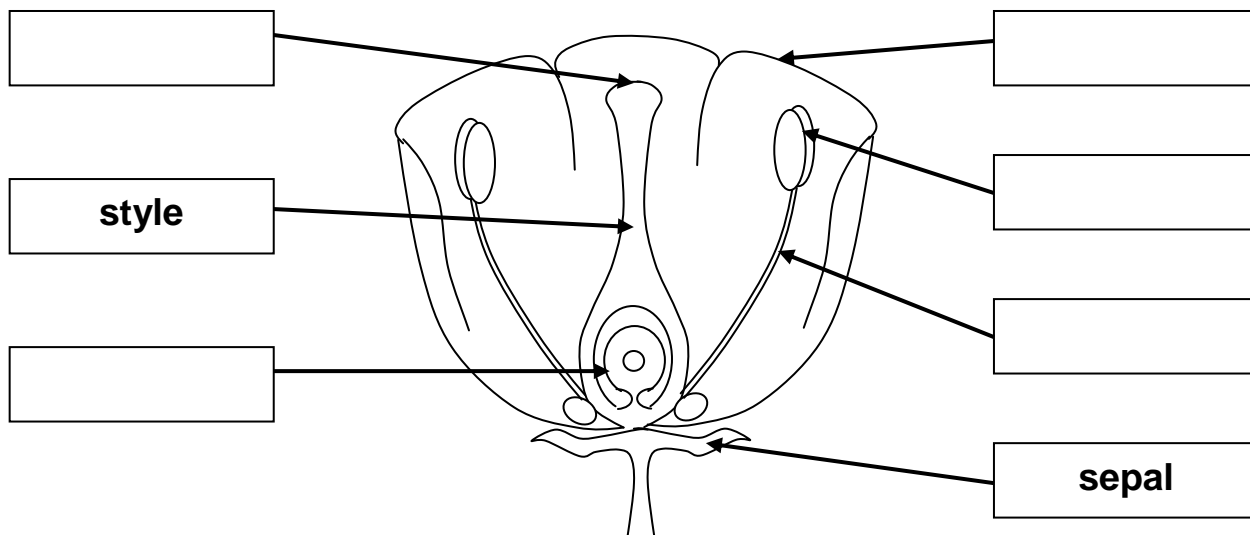
1		Look into the eyepiece lens
2		Place the smallest objective lens over the hole in the stage
3		Place the slide on the stage.
4	✓	Turn the coarse focus knob until what you see is clear.
5		Turn the coarse focus knob to make the objective lens as close to the stage as possible
6	✓	Adjust the light source.



Question SIX: Plant reproduction

a. Fill in the boxes with the name of the flower part from the words in the box below

anther	petal	filament	stigma	ovary
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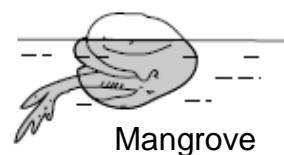


b. This flower needs insects for pollination. Suggest two ways in which the flower attracts insects.

•
•

c. Plants use different methods to disperse (spread) their seeds. Study the drawings of fruit and seeds below and decide which method they are best suited to.

wind	water	hooks	popping	eaten by animals
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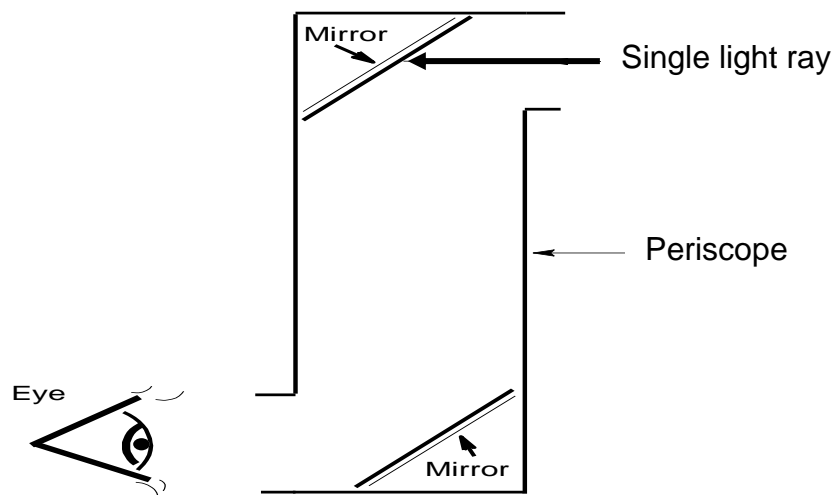
1. _____ 2. _____ 3. _____ 4. _____

- d. Explain why it is very important for seeds to be dispersed.

Question SEVEN: Light

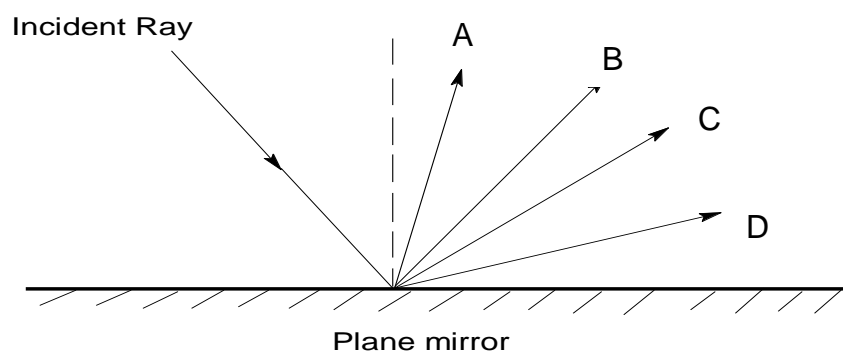
Periscopes can be used to look over walls. They contain two plane mirrors which reflect the light to the eye.

- a. Complete the diagram below to show the single light ray travelling to the eye through the periscope.

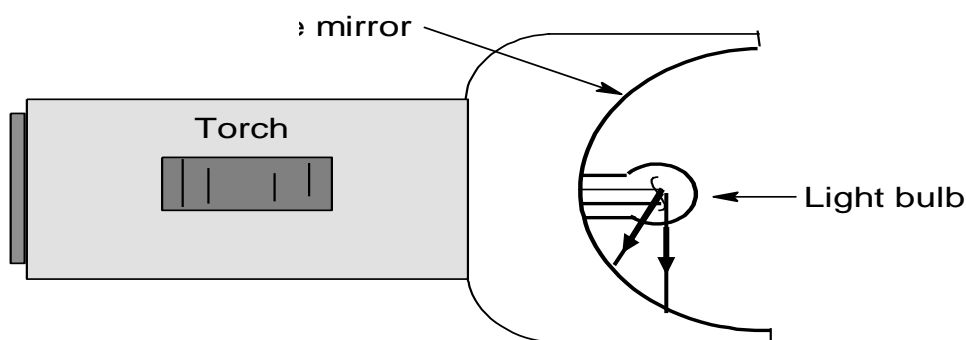


- b. A periscope works because of the law of reflection. State the law of reflection that helped you to draw the light rays travelling through the periscope.

- c. Circle the letter of the light ray in the diagram below that would best represent the reflected ray



d. The diagram below shows a torch with a bulb and a mirror.

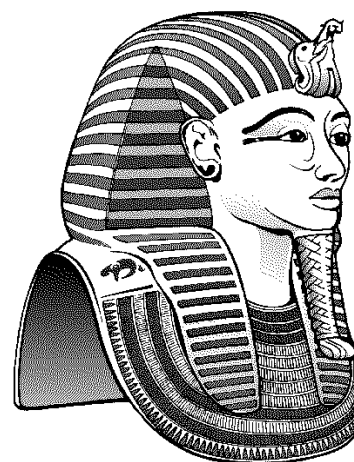


- i. What type of mirror is used in a torch? Circle your answer. **Concave** **Convex**
- ii. Explain why the torch uses this type of mirror.

- iii. On the diagram of the torch **complete the** TWO light rays coming from the bulb to show how they are reflected by the mirror.

Question EIGHT: The atom.

a. The drawing shows a gold mask from a tomb in Egypt. The gold is still shiny after thousands of years.



What is pure gold? Tick the correct box.

- | | | | |
|------------|--------------------------|------------|--------------------------|
| a compound | <input type="checkbox"/> | a mixture | <input type="checkbox"/> |
| an element | <input type="checkbox"/> | a solution | <input type="checkbox"/> |

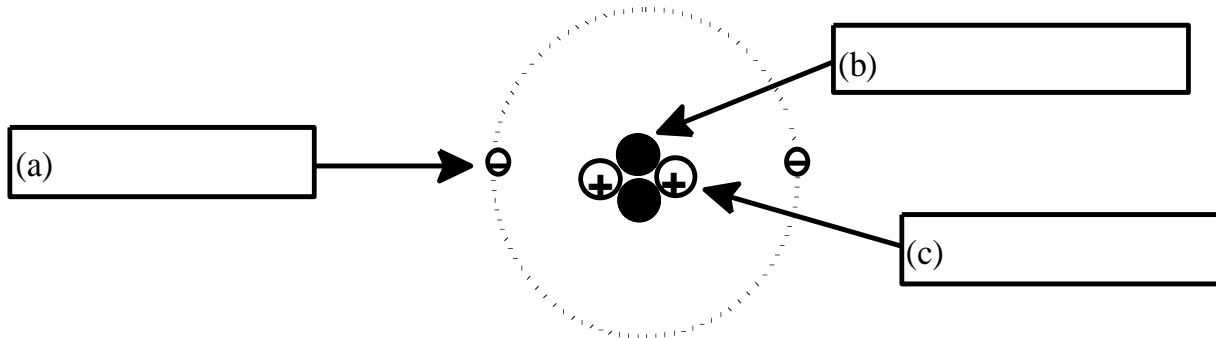
The list shows some of the properties of gold.

- | | | |
|------------------------------------|-------------------------------|-------------------------|
| A. It conducts electricity. | B. It melts at 1064°C. | C. It is yellow. |
| D. Malleable (bendable) | E. It stays shiny. | F. Unreactive. |

b. Which of the above properties make gold useful for the following jobs. Give the letter(s).

- i. Making jewellery _____
- ii. Gold dental filling _____
- iii. Electronic components _____

c. i. Complete the diagram below by labelling the parts of the atom.



The boxes below show information about atoms that are found on the periodic table. Use the information to answer the questions below.

$\begin{matrix} 27 \\ 13 \end{matrix}$ Al	$\begin{matrix} 35 \\ 17 \end{matrix}$ Cl	$\begin{matrix} 39 \\ 19 \end{matrix}$ K	$\begin{matrix} 16 \\ 6 \end{matrix}$ O	$\begin{matrix} 24 \\ 12 \end{matrix}$ Mg
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ii. Name the element with symbol O. Name = _____

iii. Which element has 12 protons. Symbol = _____

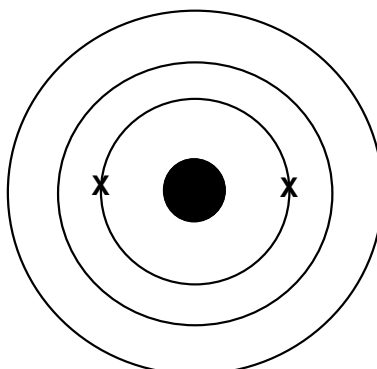
iv. Which elements are metals. Symbols = _____

v. Calculate how many protons, electrons and neutrons K, potassium, has.

Protons Electrons Neutrons

d. The atomic number of sodium is 11.

Use crosses to **complete** the diagram below to show the arrangement of electrons in an atom of sodium.



- d. An **element** contains only one type of atom. A **compound** is made up of two or more **elements** chemically joined. A **mixture** can contain several elements and/or compounds which can be separated by physical processes.

State whether each of the following substances is an **element**, **compound** or **mixture**.

- Oxygen _____
- Calcium _____
- Pure water _____
- Sodium chloride _____
- Air _____
- Carbon dioxide _____
- Copper _____
- Orange juice _____
- Magnesium _____

- e. i. Complete these sentences about chemical and physical change.

A new material is not formed as a result of a _____ change. It may be a different form of the same substance.

A _____ change can be considered as a change that makes a new substance(s), with different properties.

- ii. Decide whether each change is a physical or a chemical change. The first one has been done as an example.

Every day observation	Physical or chemical change
an egg boiling	<i>Chemical change</i>
water freezing	
vinegar making baking soda fizz	
an iron nail rusting	
your clothes drying on the line	
melted wax going hard (solidifying)	
wood burning	

Question NINE: The Organs and Food.

a. Which organs in the human body are being described?

A bag containing acid and enzymes which break down food.	
The first part of the digestive system. This organ produces enzymes which digest starch.	
This organ, about the size of your fist, pumps blood around the body.	
These organs are where oxygen from the air moves into the blood.	
These organs are bean shaped and produce urine.	

b. The table below shows the mass of water, fat, fibre and vitamin C in 100g of potato cooked in three different ways.

	water, in g	fat, in g	fibre, in g	vitamin C, in mg
100 g of chips	57	7	2	9
100 g of boiled, peeled potato	80	hardly any	1	6
100 g of potato baked in its skin	63	hardly any	3	14

Use the information from the table to help you fill in the gaps in the following sentences.

i. Chips are crisper than boiled potatoes because chips contain **less**

_____.

ii. Most of the fibre in potato is in the _____ of the potato.

c. Calculate how much vitamin C is in

50g of chips _____ mg

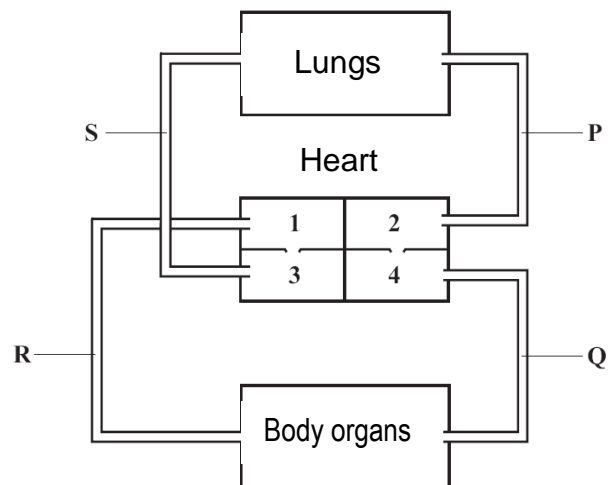
200g of potato baked in its skin _____ mg

d. i. People do **not** always eat a balanced diet. What is meant by the term “a balanced diet”?

- ii. Draw **one** line from each fact about a person's diet to the organ it harms.
Draw only **three** lines.

fact about the diet	organ harmed
not enough calcium	heart
not enough fibre	intestine
too much fat	lung
	bones

- e. The diagram shows part of the circulatory system. The chambers of the heart are numbered **1** to **4**. Use it to answer the following questions.



In each case TICK the correct box.

- i. Blood is pumped by the heart to the lungs and back to the heart.

Which sequence shows the path of the blood through the chambers of the heart, as it passes from the heart to the lungs and back to the heart?

1 → 2 → lungs → 3 → 4 1 → 3 → lungs → 2 → 4

2 → 1 → lungs → 3 → 4 2 → 4 → lungs → 1 → 3

- ii. Which blood vessels carry blood containing very little oxygen?

P and Q **P and R**

Q and S **R and S**

iii. Which parts ensure that blood flows in the correct direction through the heart?

Arteries

Elastic fibres

Valves

Veins

iv. Blood is forced out of the heart by the contraction of the

Arteries

Atria

Diaphragm

Ventricles

Question TEN: Food Test

a. A food company carries out laboratory tests on some of its products. The results are recorded below. Fill in the gaps to complete the report.

Product	Food type being tested	Chemicals added	Positive result
Honey		Benedicts solution	
Bread			Change to a blue-black colour
Milk		Sodium hydroxide and copper sulfate solution	

i. Explain, in detail, why we need to eat protein.

ii. If you bought a packet of food labelled “Energy food”, what food type would it probably contain most of? Circle your answer.

fat

carbohydrate

protein

vitamin & minerals

iii. When starch is broken down in the digestive system, what is the name of the small nutrient molecules it makes? _____

- b. Martin wrote down all the food he ate one day and the energy content of each item. His results are listed below.

<u>Breakfast</u>		<u>Lunch</u>		<u>Dinner</u>	
3 weetbix, milk, sugar	900kJ	2 sandwiches	1200kJ	Potatoes	400kJ
Cup of coffee	400kJ	Can of Coke	600kJ	Peas	200kJ
		Apple	250kJ	Meat	1000kJ
				Corn	400kJ
				Ice-cream	600kJ
				Fruit	300kJ

Calculate how much energy Martin would gain from all the food he eat on this day. Show all working.

Answer: _____ kJ

- c. Cows are herbivores, while lions are carnivores. Cows chew their food for a long time. Lions swallow big lumps of meat without chewing.

Explain how the types of teeth found in a cow and in a lion are suited to their diet.

Cow:
Lion:

Well Done. Do the next paper.