FULL NAME:	SCIENCE TEACHER:	**9B**

SCIENCE

Year 9 Examination 2010

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

Question	*m/c*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*Total*
Marks gained													
Marks available	*40*	*7*	*4*	*5*	*2*	*3*	*1*	*4*	*3*	*3*	*5*	*3*	*80*

Question One: Skills in Science. [7 marks]

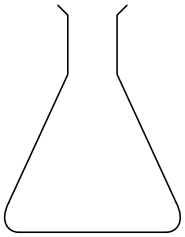
Sophie burns a potato chip to find out how much energy is stored in it.
Energy from the burning chip raises the temperature of the water in the test-tube.

(a) Describe **two** ways in which Sophie is carrying out this experiment safely.

1.
2.

In Science we use many pieces of scientific equipment.

(b) Draw the correct 2D **symbol** used to represent the following equipment. The conical flask is done as an example. Use a ruler where you can.

1. Conical flask 	2. Evaporating dish / basin	3. Heatproof Mat
4. Test tube	5. Bunsen burner	6. Filter funnel

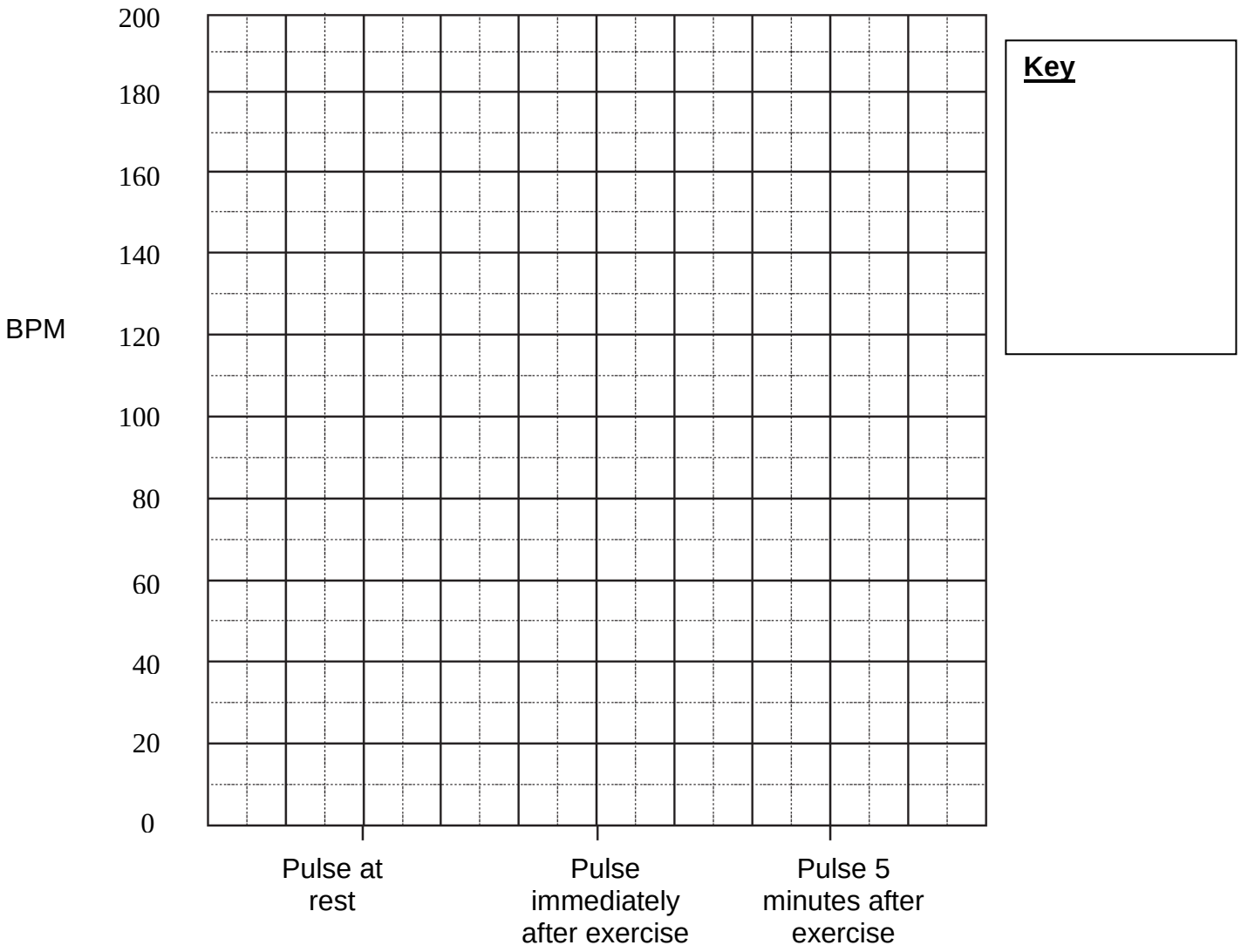
(c) Draw using the correct scientific symbols, a diagram to show how you would heat a beaker of water. Don't forget to include all labels.

(d) Two 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	55	145	100
2	70	190	165

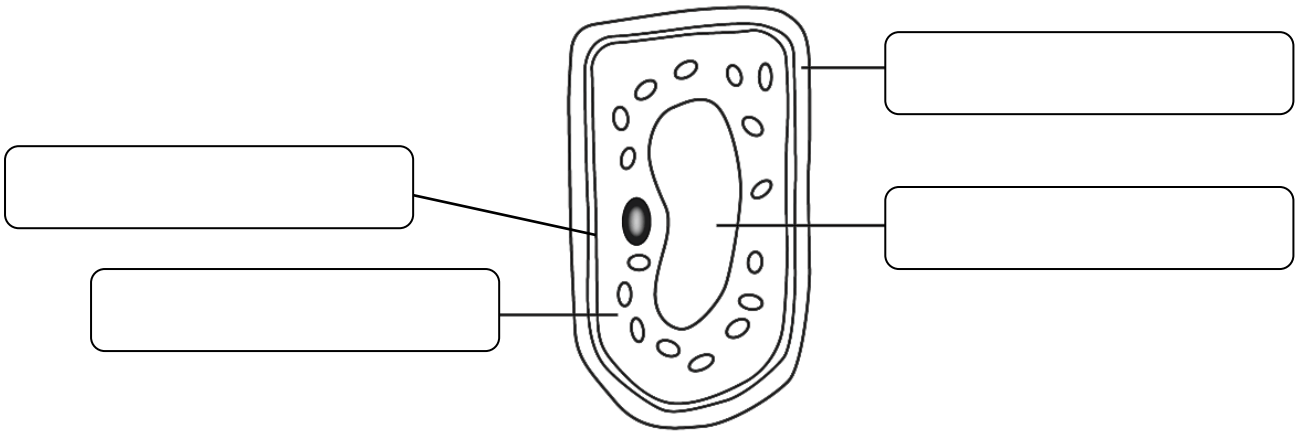
Using the grid, plot a bar graph for students 1 and 2. Don't forget to complete the key.



Question Two: Under the microscope [4 marks]

Living organisms are made up of cells that can all do different jobs.

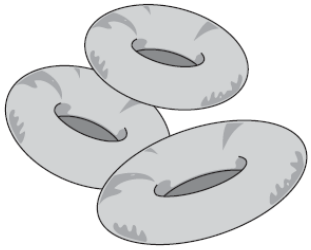
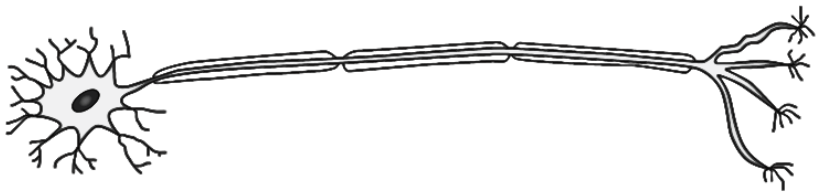
(a) This is a diagram of a typical leaf cell from a plant. Complete the missing labels.



(b) Name two cell structures that are found in **both** plant and animal cells.

1.	2.

(c) Specialised plant cells are adapted to do particular jobs. Specialised cells in the human body carry out particular functions.

 Red blood cells	 Nerve cell (neurone)

Choose EITHER of the cells above. Describe **one** special feature and explain how this feature helps the cell to carry out its function.

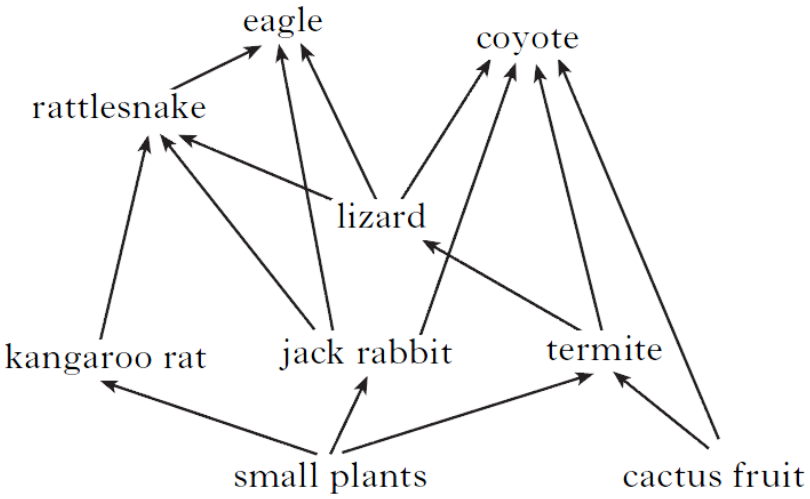
red blood cell **nerve cell** (circle your choice)

- Feature

- How this feature helps the cell to carry out its function

Question Three: Feeding Relationships [5 marks]

A food web from a desert habitat is shown below.



(a) Write out ONE food chain from this web involving the lizard.

(b) Name an organism from this food web that is an **omnivore**.

(c) Name an organism from the food web that is **both** a predator and a prey.

(d) The rattlesnake population is wiped out by disease. How will this affect the number of
(i) kangaroo rats?
(ii) eagles?
Explain your answers.

(i) Kangaroo rat numbers will **increase / decrease** (circle your answer) because….
(ii) Eagle numbers will **increase / decrease** (circle your answer) because….

Question Four: Energy Resources, Transformations and Efficiency [2 marks]

The picture shows a top-loading washing machine. When the door is closed and the machine switched on, an electric motor rotates the drum and the washing.

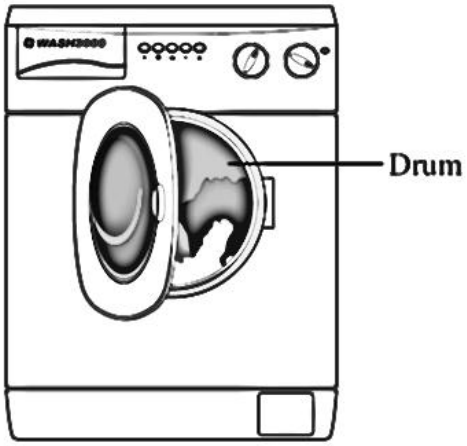
(a) Complete the following sentences.

An electric motor is designed to change electrical energy into _____ energy.

Some of the electrical energy supplied to the motor is wasted as _____ energy and

_____ energy.

(b) Below is a picture of a new front-loading washing machine. It has a label explaining its energy use.

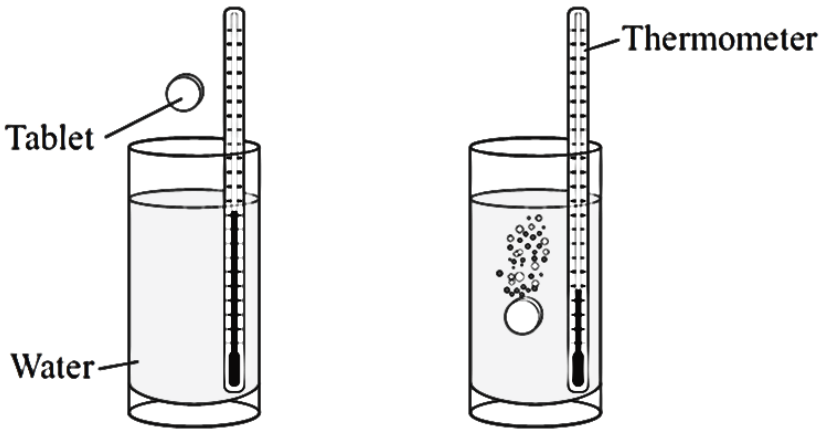


Model – Wash 3000 Energy A	
More efficient A B C D E Less efficient	A
Energy consumption kWh/wash cycle (based on 40 °C wash)	1.1

An 'A' rated washing machine is more energy efficient than a 'C' rated washing machine.
Explain what being "more energy efficient" means.

Question Five: Physical and Chemical Changes [3 marks]

When an indigestion tablet is added to cold water, several changes takes place.



(a) What are three observations the student might make? (They are not all shown in the diagram).

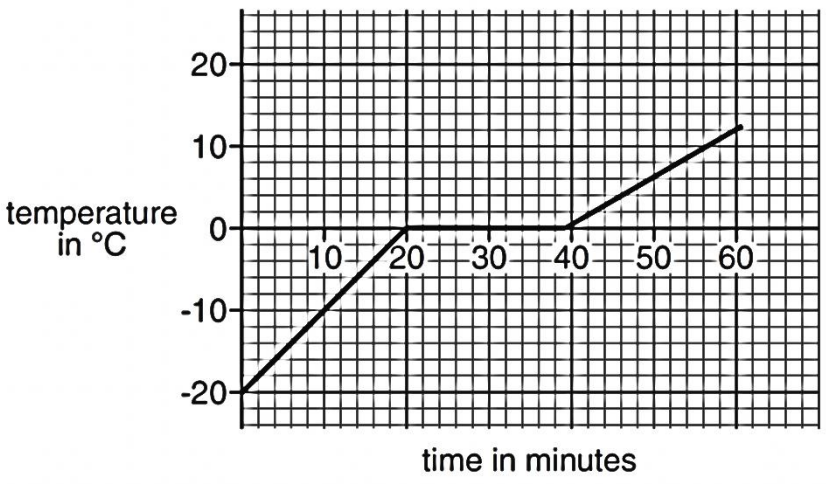
1.
2.
3.

(b) Is this an example of a chemical change or a physical change? Explain your answer.

It is a **chemical / physical** change (circle your answer) because….

Question Six: The State of Peas [1 mark]

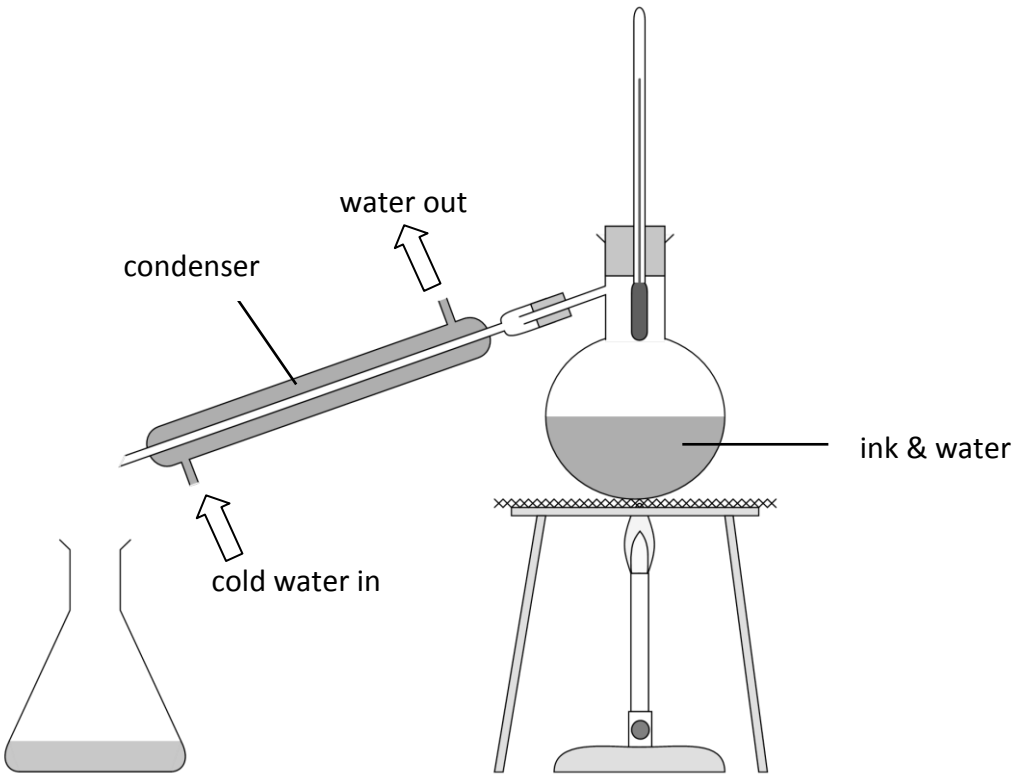
John takes a packet of frozen peas out of his freezer. The peas are covered in ice. He measures the temperature of the peas every few minutes for an hour.
Look at the graph of his results.



The temperature does not change between 20 minutes and 40 minutes. What is happening to the bag of peas between 20 minutes and 40 minutes?

Question Seven: Separating Mixtures [4 marks]

Below is a picture of some equipment used to separate a mixture of ink and water.



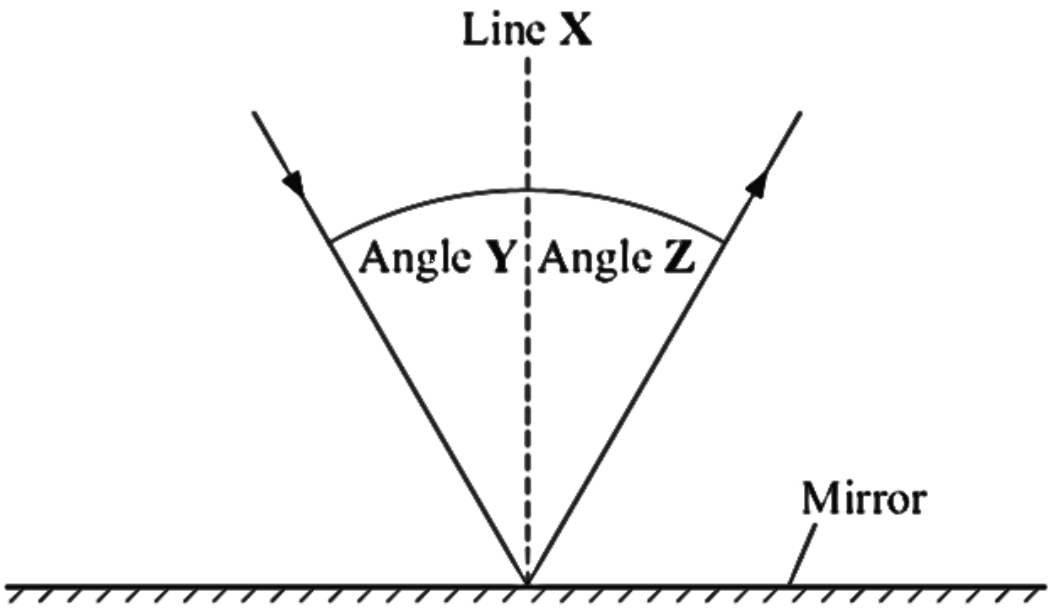
(a) This method of separation is called _____

(b) Describe the function of the condenser in the diagram above.

(c) Discuss how this equipment is able to separate a mixture of ink and water.

Question Eight: Light [3 marks]

The following diagram shows a ray of light which is reflected by a mirror.



Complete the following sentences by drawing a circle around the **correct word or phrase** in each box.

(a) The type of mirror in the diagram above is

concave
convex
plane

(b) Line X is a vertical line at right angles to the mirror and is called the

the usual
the normal
the critical angle

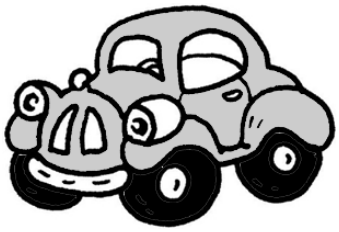
(c) Angle **Y** is called the angle of

incidence
reflection
refraction

(d) If angle **Y** is doubled, then angle **Z** will

be halved
stay the same
be doubled

Light is made up of 7 different colours.



(e) The car is green.

Explain why we see the car as being green.

Question Nine: Hearing of Different Mammals [3 marks]

The table gives information about the frequencies in the hearing ranges of six different mammals.

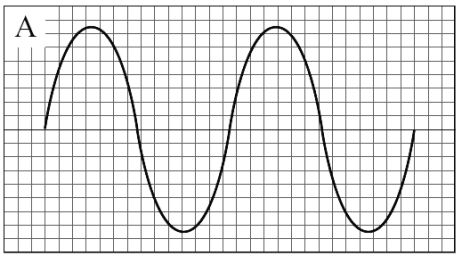
Name of mammal	Frequencies in hearing range
Bat	20 Hz → 160 kHz
Dog	20 Hz → 30 kHz
Dolphin	40 Hz → 110 kHz
Elephant	5 Hz → 10 kHz
Human	20 Hz → 20 kHz
Tiger	30 Hz → 50 kHz

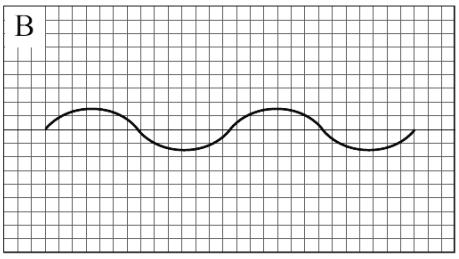
(a) Which mammal in the table can hear the highest frequency?

(b) Give one example of a frequency which an elephant can hear but which a tiger cannot hear.

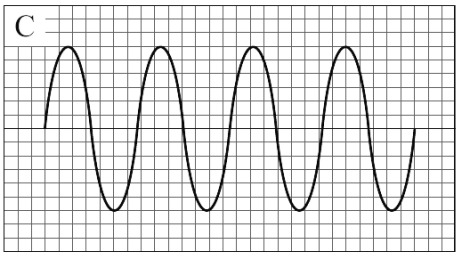
The diagrams show four sound waves, A, B, C and D, represented on an oscilloscope screen. They are all drawn to the same scale.

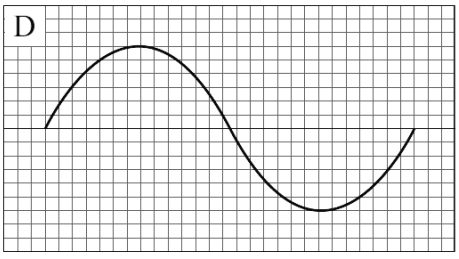
(c) Which wave has the greatest amplitude?





(d) Which wave has the highest frequency?





Question Ten: The atom [5 marks]

(a) This list shows some of the properties of aluminium.

A. It conducts heat
B. It is shiny
C. It does not rust
D. It is malleable (bendable)
E. It is light
F. It is a solid at room temperature

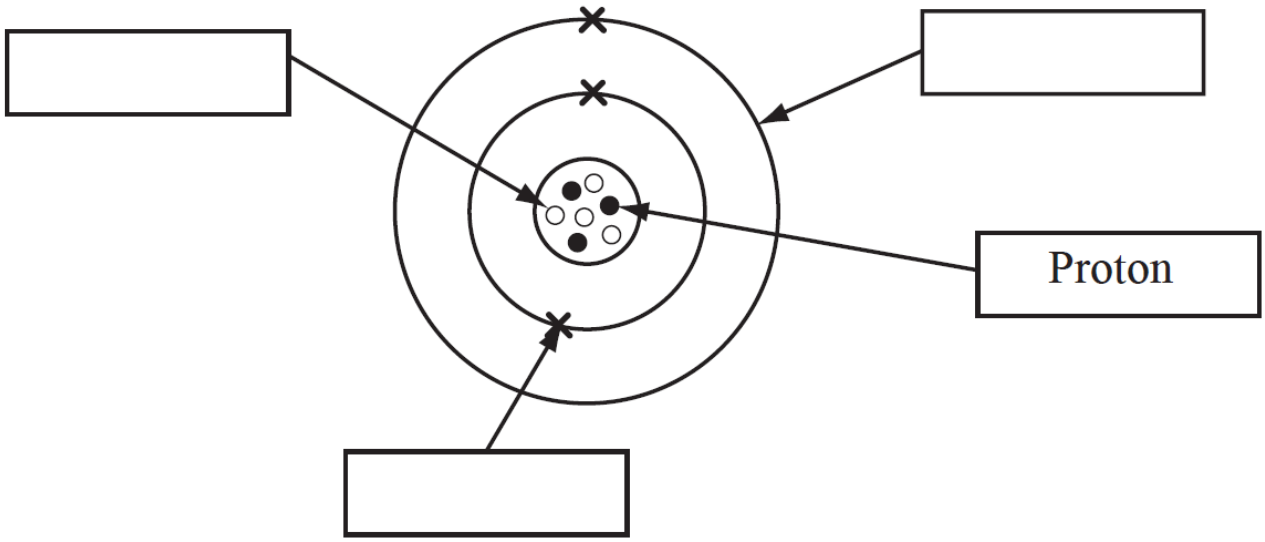
Which of the above properties make aluminium useful for the each of the following jobs. Give the letter(s).

(i) Making aeroplanes _____

(ii) Soft drink cans _____

(iii) Window frames _____

(b) The diagram shows the structure of an atom.



(i) Use words **from the list** below to label the diagram.

electron ▪ shell ▪ core ▪ neutron ▪ cell

(ii) What is the atomic number for this atom? Circle the correct answer.

3 4 7 10

(iii) What is meant by the term mass number? Circle your answer. Choose from:

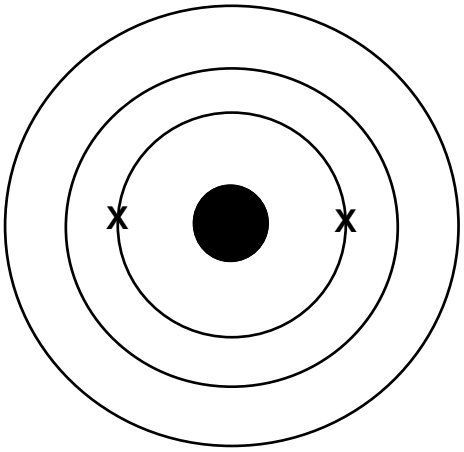
number of protons + neutrons

number of protons + electrons

number of electrons + neutrons

(c) 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 a **mixture.**

Smoke _____

Calcium _____

Pure water _____

Sodium chloride_____

Air _____

Carbon dioxide _____

Gold _____

River water _____

Copper _____

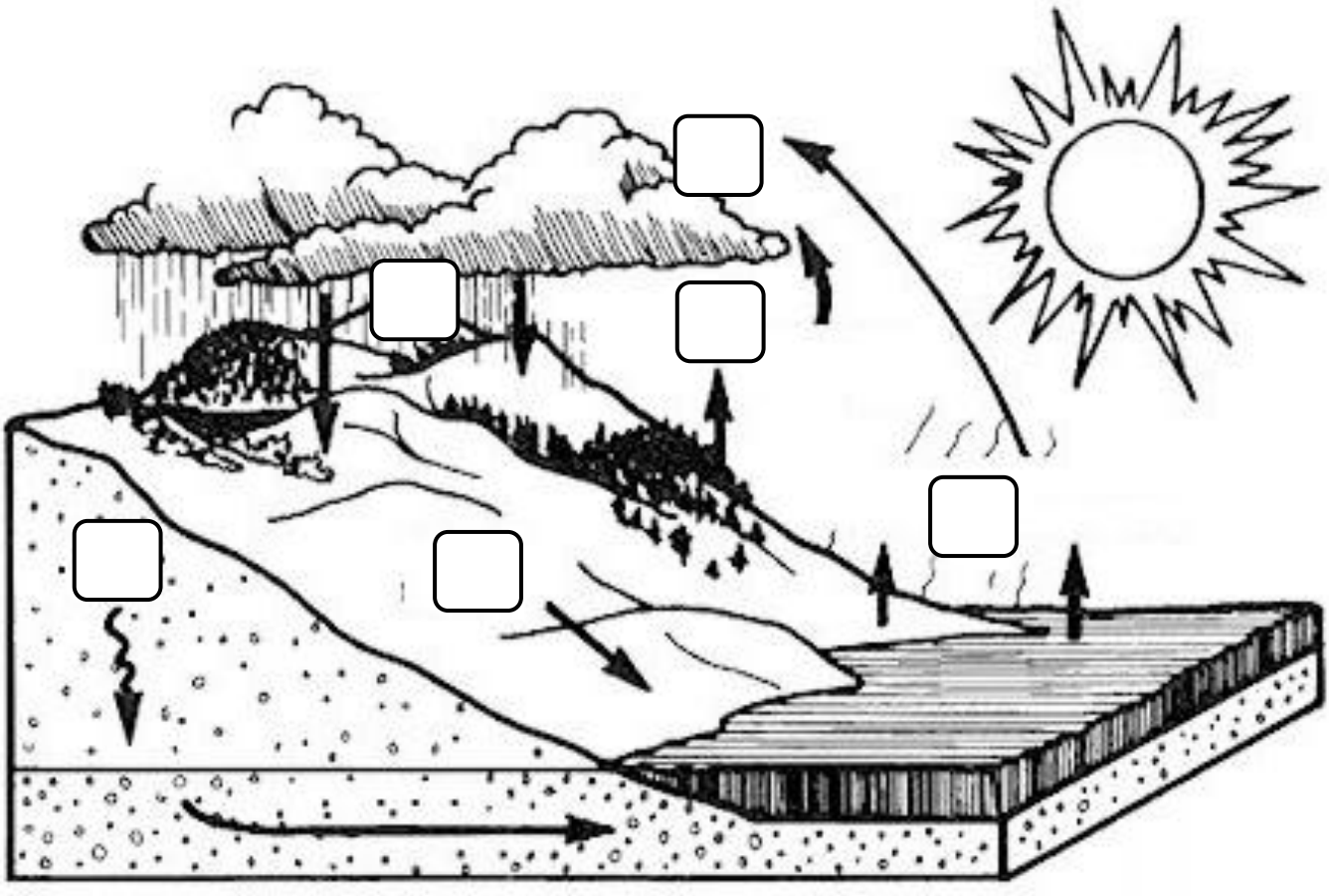
Question Eleven: Weather and The Water Cycle [3 marks]

The Water Cycle (also know as the hydrologic cycle) is the journey water takes as it circulates from the land to the sky and back again in a never-ending cycle.

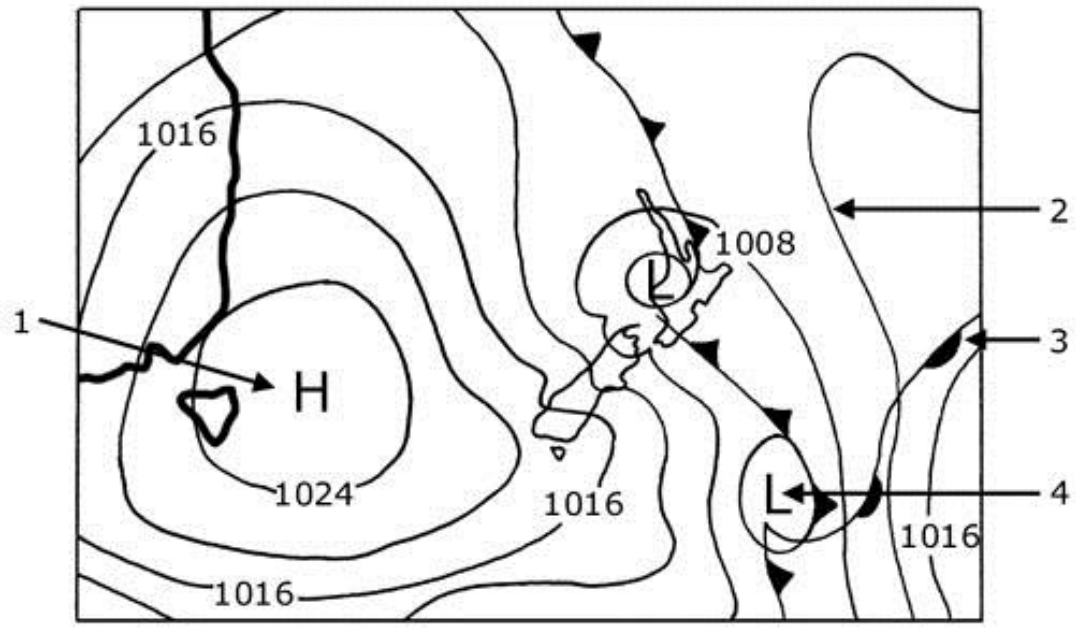
Condensation *happens when the water vapour in the air turns back into a liquid in the sky.*
Once water reaches the earth, water can soak into the ground. This is known as ***infiltration.***
One stage of the cycle is ***precipitation****. This is when water falls from the sky as rain, hail or snow. When water falls to the ground, the cycle starts again.*
Runoff *is the water that does not soak in. It flows into our creeks, rivers, lakes and oceans.*
When the sun heats up water in rivers, lakes or the ocean it turns into vapour or steam. This is called ***evaporation****. The water vapour or steam leaves the river, lake or ocean and goes into the air.*
Plants also release water into the air through their leaves. This is called ***transpiration****.*

(a) Label the Water Cycle diagram below. Put the number for each word in the diagram below.

1	2	3	4	5	6
condensation	**evaporation**	**infiltration**	**precipitation**	**runoff**	**transpiration**



(b) Name the features 1 – 4 shown on the weather map



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Number	1	2	3	4
Feature				

Now start Paper A or Paper C