

NAME:	SCIENCE TEACHER:	10B
-------	------------------	------------

SCIENCE

Year 10 Examination 2008

10B – 80 marks

Make sure that you have answered all the questions in this paper before you start paper 10A or 10C

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.

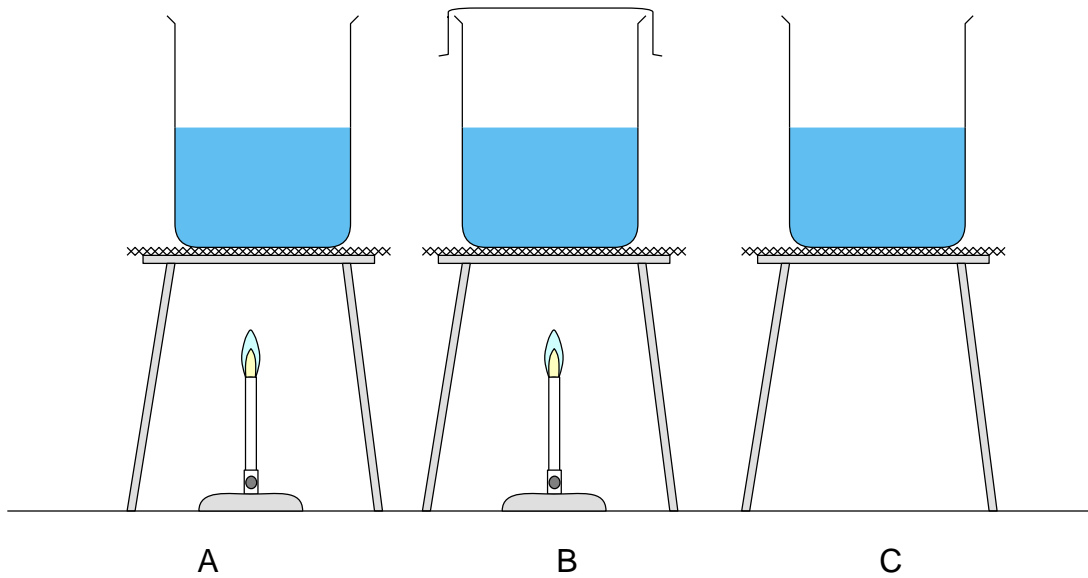
Give units for all answers (eg kg or m) unless they are already provided.

For Teacher Use

<i>Question</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	<i>Total</i>
<i>Marks gained</i>															
<i>Marks available</i>	8	9	7	9	3	8	2	9	5	4	8	3	3	2	80

Question ONE:

Three experiments were carried out to investigate the heating of water in three identical beakers.



In the first experiment a beaker of water was heater by a burner (experiment A). the experiment was repeated with a lid on the beaker (experiment B). In the third, control, experiment the beaker was left on the tripod without being heated (experiment C)

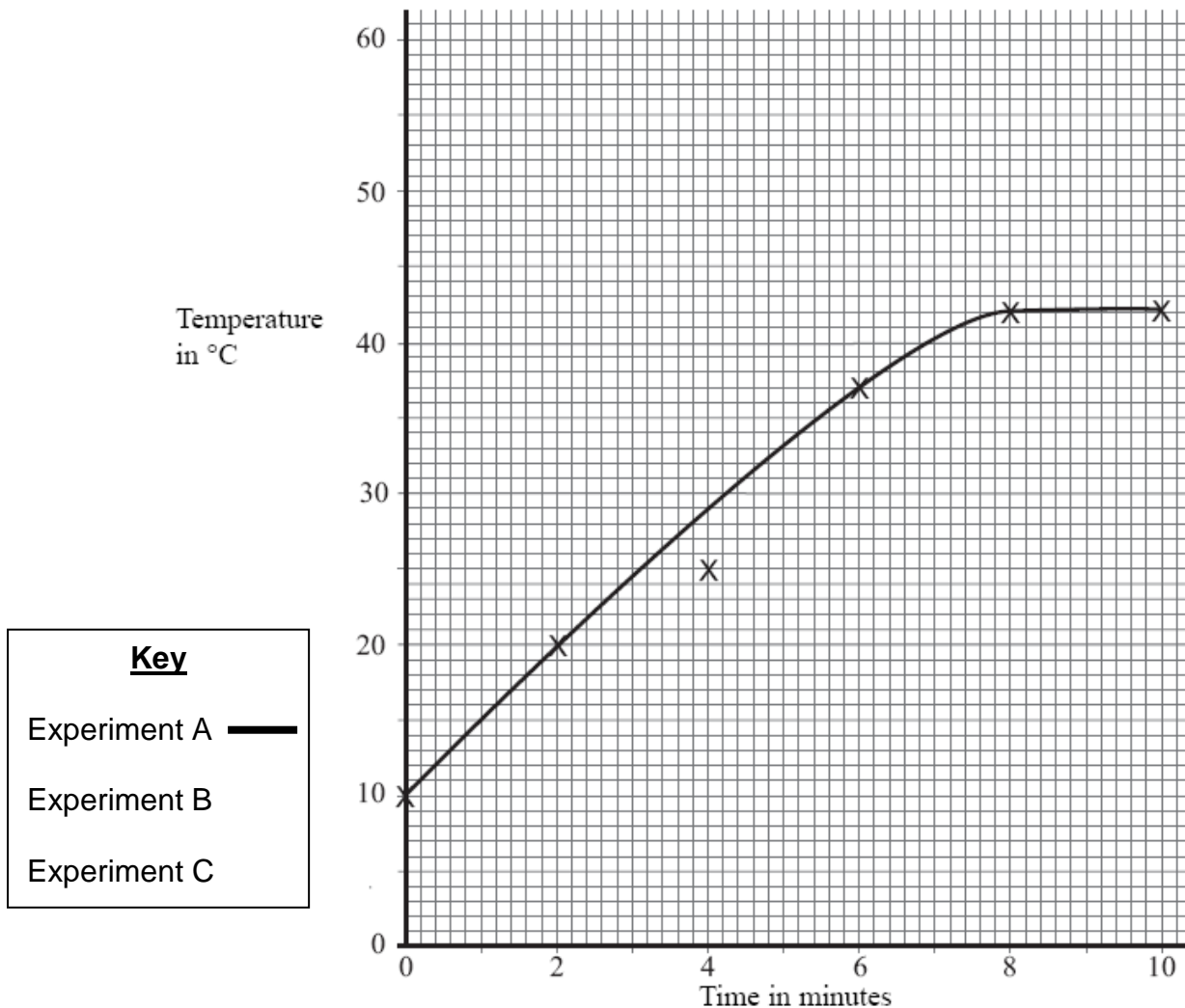
The results are shown in the table below:

Time in minutes	Temperature in °C		
	A	B	C
0	10	10	10
2	20	30	11
4	25	44	12
6	37	55	14
8	42	55	14
10	42	55	14

- a. List THREE variables (factors) that you would need to control while doing this experiment.

•
•
•

- b. What piece of scientific equipment would you use to measure the temperature of the water? _____
- c. The results for experiment A have been plotted on the graph below. Using the same axis plot the results for experiments B and C. Use the most suitable line to join up the points and complete the key.

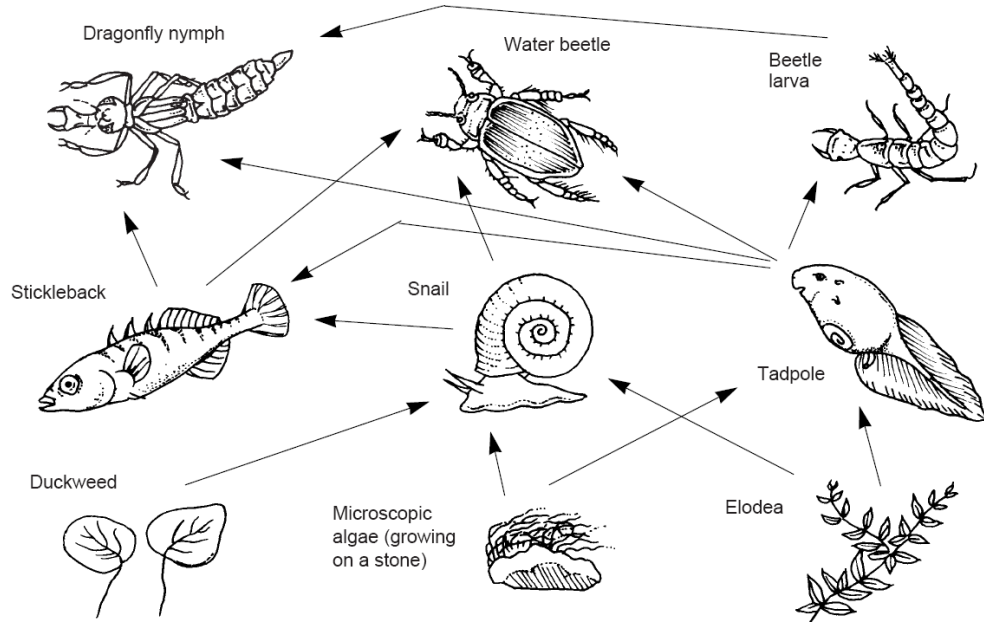


- d. Using your completed graph calculate the following:
- How long it took experiment A to reach 30 °C: _____
 - What temperature experiment B was at 5 minutes: _____
 - The difference in temperature between experiment A and C after 5 minutes:
Show all working.

e. The lid on the beaker in experiment B changed the results. What difference did the lid make?

Question TWO:

Below is a food web for a pond community. Study it and use it to answer the following questions.



a. Name TWO producers in this food web.

-
-

b. Draw / write a food chain from the diagram above that contains at least four organisms.

c. Name a secondary consumer in the food chain above and explain why it is called a secondary consumer

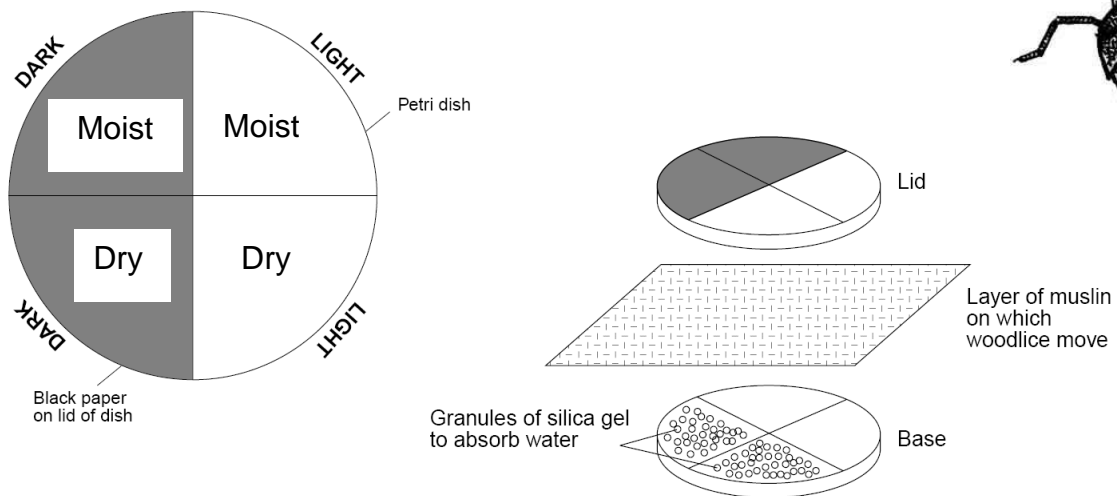
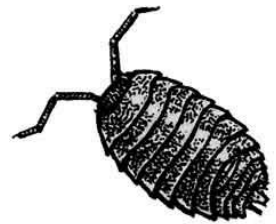
d. Explain what the arrows in a food web or food chain represent.

e. Describe ONE factor which would increase the number of water beetles?

f. If the number of dragonfly nymphs increased, explain what would happen to the numbers of snails.

Question THREE:

In an experiment to investigate the preferred environment of woodlice (slaters), a “choice chamber” was set up as shown below:

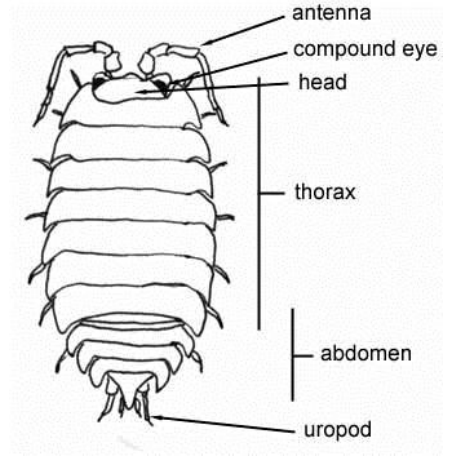


a. i. In which quarter of the chamber would you expect to find the most woodlice after a few hours?

ii. Explain your answer.

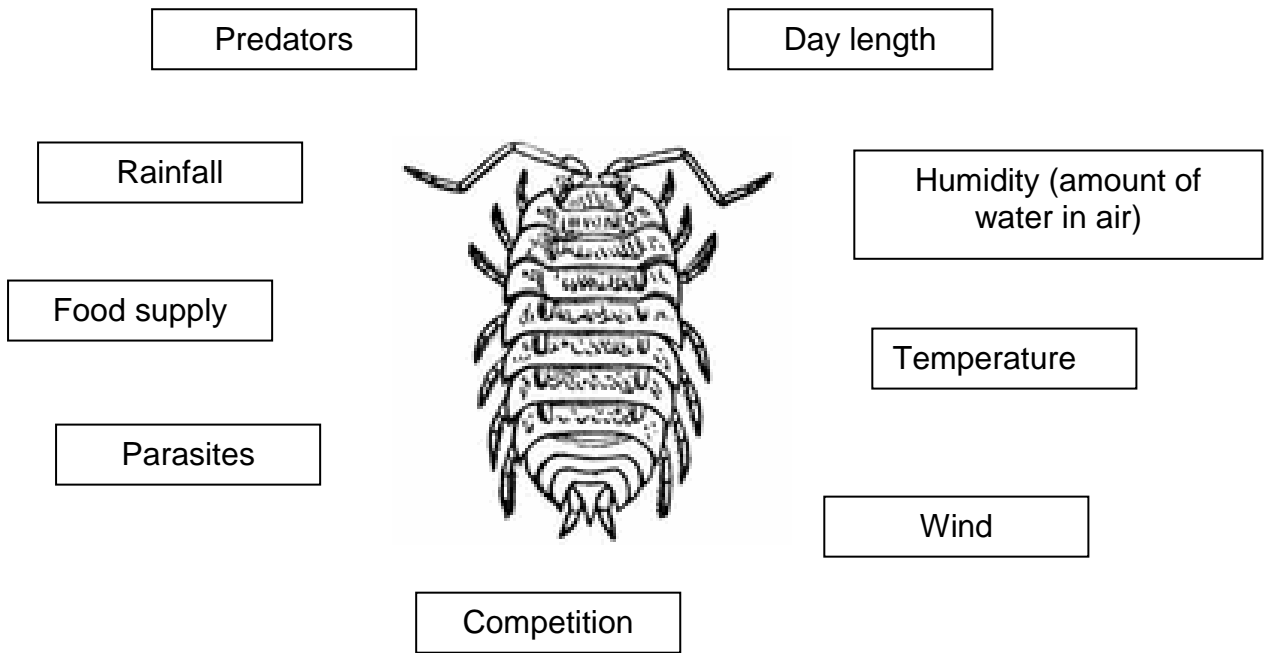
b. Give TWO structural adaptations of a woodlice:

-
-



c. Explain how ONE of the structural adaptations for part b helps it to survive.

d. Study the diagram below and list the abiotic (non-living) and biotic (living) factors that affect the woodlice in the table.



Abiotic Factors	Biotic Factors

Question FOUR:

- a. Rebecca was doing some science in the kitchen. She squeezed the juice from two lemons and divided it equally into two glasses. She put a teaspoon of baking soda (sodium hydrogen carbonate) into one and a teaspoon of salt (sodium chloride) into the other.

In the glass with baking soda there was lots of fizzing. The foam spilled over the rim of the glass! In the glass with salt, the salt seemed to disappear.

One of these changes was physical and the other was chemical. Decide on the type of change occurring in each glass. Explain your decision

Baking soda and lemon juice

- i. Physical change / Chemical change (circle one)

- ii. Why I think this:

Salt and lemon juice:

- iii. Physical change / Chemical change (circle one)

- iv. Why I think this:

- b.

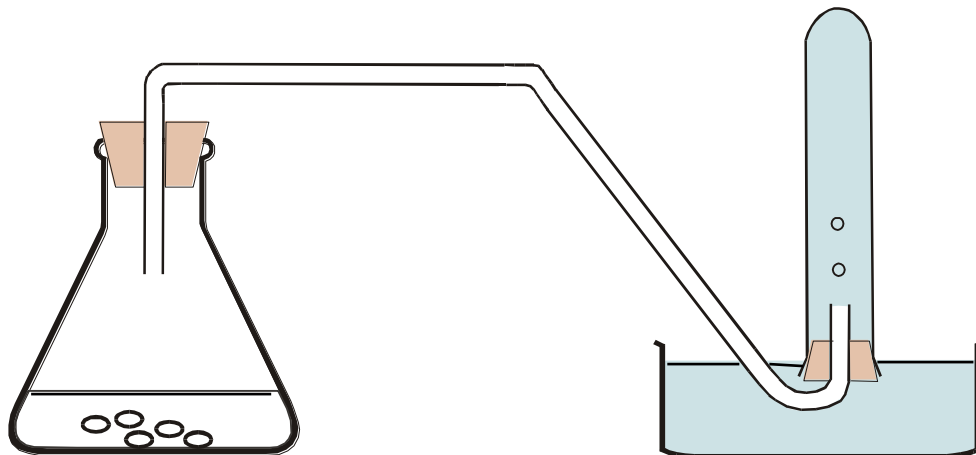
Jo used tongs to hold a piece of magnesium ribbon over a blue Bunsen burner flame until it started burning. Her partner, Matty, noted that it burnt with a bright white light. Jo said that it was reacting with the oxygen in the air.

At the end of the reaction they noted that the grey solid had changed into a white powder, which Jo said was magnesium oxide.



Write a word equation for this reaction.

- c. A student carried out the following experiment by reacting magnesium metal with hydrochloric acid. This produced magnesium chloride and hydrogen gas. The student collected the hydrogen gas produced by this reaction in a test tube.



- i. Describe the ONE fault in the experiment the student has set up to prepare and collect hydrogen gas?

- ii. Write a word equation for the above reaction.

- iii. State two observations that would indicate a chemical reaction had taken place.

-
-

- iv. Explain how you would test the hydrogen gas produced during this reaction.

- v. List TWO physical properties of Hydrogen gas.

-
-

Question FIVE:

In Science we often use chemical formula instead of writing the chemical names out in full. Complete the table below by correctly writing the chemical formula or chemical name as required.

Chemical Name	Chemical Formula
Water	
	HCl
Oxygen	
Carbon dioxide	
	NaOH
Sulfuric acid	
Hydrogen	
Sodium chloride (common salt)	

Question SIX:

Red litmus paper was put into test tubes containing hydrochloric acid, water and sodium hydroxide solutions. It only changes colour in one of the test tubes.

a. i. Which substance did the litmus change colour in? Circle your answer.

Hydrochloric acid **Water** **Sodium hydroxide**

ii. What colour did the litmus become? _____

b. Universal indicator is used to test whether solutions are acidic or basic. **Fill in the following SIX gaps** on the universal indicator chart below.

pH 1 2 3 4 5 6 ____ 8 9 10 11 12 13 ____

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Red Orange _____ Green Blue _____

_____ NEUTRAL _____

- c. i. People often take indigestion for heartburn. Val wanted to find out more about these tablets so she decided to carry out a simple test. The student has a beaker of liquid to which she adds an indicator. The indicator turns orange. Write down ONE thing she could tell about the liquid. Use the previous table to help you.

•

The student now adds indigestion tablets to the liquid one at a time. Here are her results.

Number of tablets added	Colour of mixture in the beaker	pH
1	Orange	4 – 6
2	Orange	
3		4 - 6
4	Orange	4 – 6
5	Green	7
6	Blue	
7	Blue	8 - 10

- ii. Val has not finished the table. Fill in the three empty boxes.
- iii. What colour shows when the mixture is neutral? _____
- iv. How many tablets are needed to make the mixture neutral? _____
- v. Val now adds an extra tablet (number 8) to the mixture. What colour is the mixture now? Circle the best answer.
- Red Orange Green Blue**
- vi. The acid and the tablet react. What sort of reaction happens? Circle the best answer.
- Burning Fermenting Neutralising Corroding**
- vii. Val does an experiment with another type of indigestion tablet. This tablet gives off a gas which turns limewater cloudy. What is the name of this gas?
- _____

Question SEVEN:

Alfred Wegener was a German scientist who worked in the early part of the 20th century.

His theory was that about 250 million years ago all the continents were connected together in a single 'super continent' which he called Pangaea.

He suggested that the super continent split up and separate continents drifted apart.

For each question write the LETTER of your answer in the box provided.



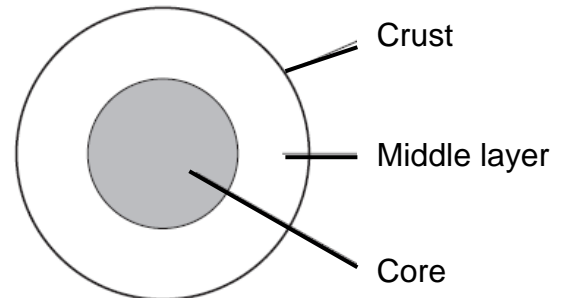
a. One piece of evidence that Wegener used was that some continents

- A have similar shapes to each other
- B have similar weather patterns
- C have coastlines which fit quite closely together
- D have similar vegetation

b. Many scientist did not accept Wegener's theory because

- A the continents did not have all the same animals
- B the continents did not have all the same plants
- C there was no way to explain how continents could move
- D the Earth's crust stayed the same

The diagram shows the layered structure of the Earth



c. The middle layer of the Earth is called the....

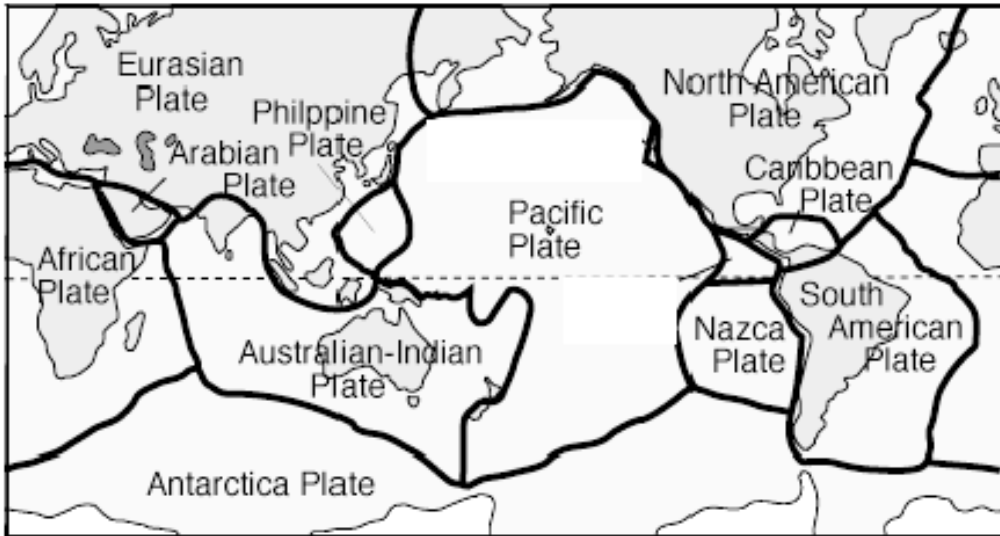
- A atmosphere
- B lava
- C magma
- D mantle

d. The material in the middle layer is moving slowly. This movement is caused by

- A the rotation of the Earth
- B the drifting tectonic plates
- C the cooling of the Earth
- D convection currents

Question Eight:

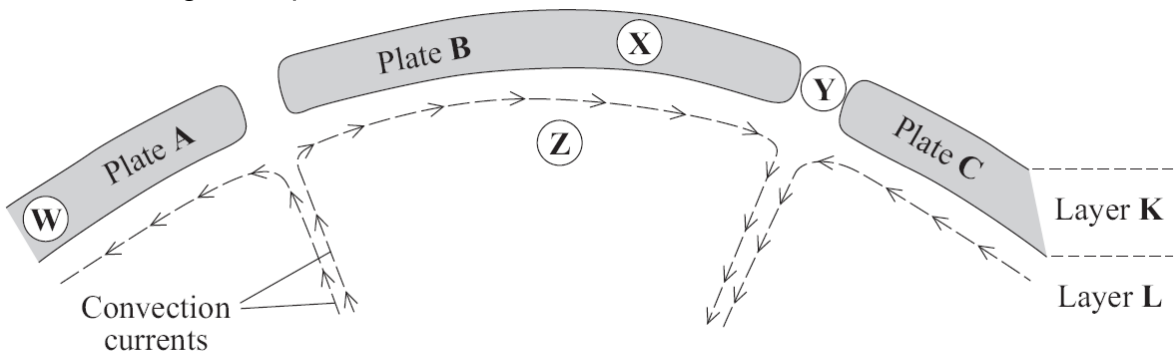
Use the map below to help you answer the following questions.



- a. Which TWO plates is New Zealand located on?

•	•
---	---

- b. The diagram represents the area near to the Earth's surface.



- i. Which row in the table correctly names the layers **K** and **L**?

	K	L
A	Crust	Outer core
B	Crust and upper mantle	Core
C	Crust	Crust
D	Crust	Mantle

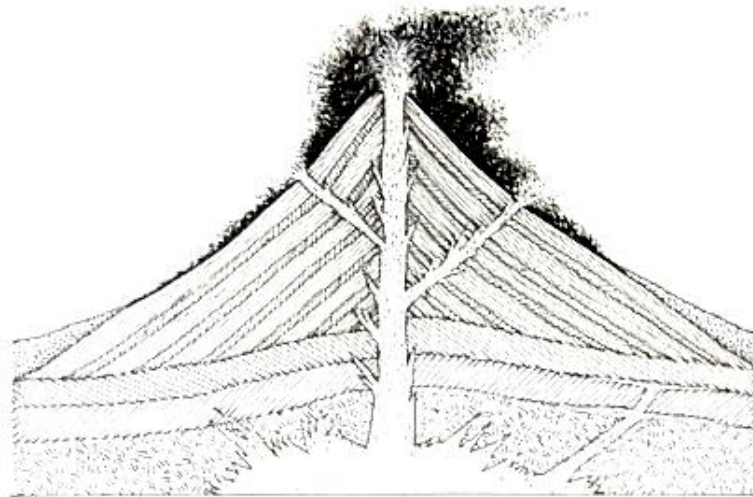


- ii. Which plates are moving towards each other? _____
- iii. In which area, W, X, Y or Z in the diagram would you expect earthquakes to occur? _____

iv. There are volcanic islands in several parts of the mid-Atlantic Ocean. Explain why they have probably formed in this region.

c. There are often volcanoes located at plate boundaries. Label these parts on the volcano below.

Crater	Side vent	Layers of ash and lava
Magma	Magma chamber	Ash and rock particles



Ash from the 1996 Mt Ruapehu eruption fell on the playground at Taupo School. After they had been skidding on the wet grass at playtime, Rewi and Amanda felt the skin on their legs burning.

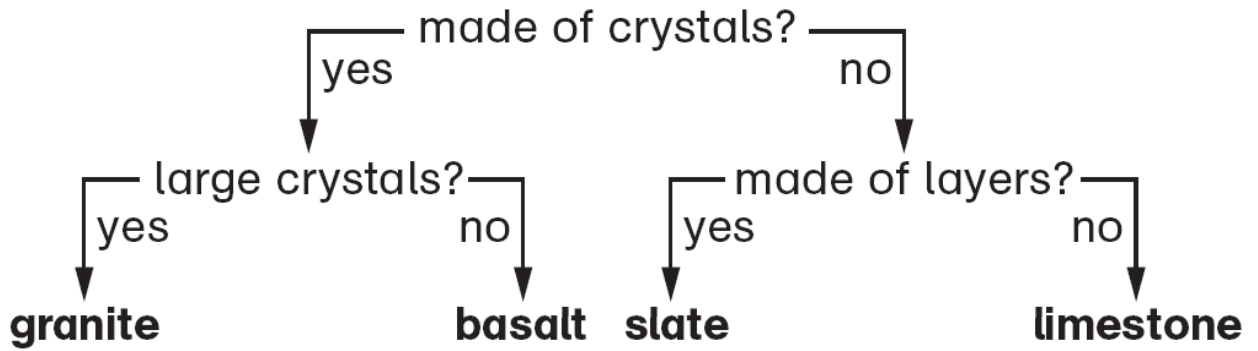
Amanda suggested that something in the volcanic ash was acidic and that this caused the burning feeling.

d. Explain **in detail** how Amanda could test the ash and see whether it was acidic or not? Include the method, chemicals used and results you would expect if the ash was acidic.

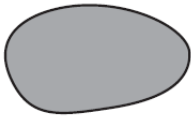
More space over page.

Question NINE:

a. This key is used to name four rocks.

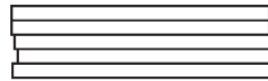


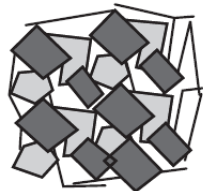
Use the key to name these four rocks. The first one has been done for you.



LIMESTONE







The table gives the name of three different rocks and how they are classified; use it to help you answer the following question.

Name of rock	Class of rock
Granite	Igneous
Marble	Metamorphic
Shale	Sedimentary

b. In the table below, draw lines to connect the name of each rock to the description of how the rock was formed and then the correct description of features of the rock.

how the rock was formed	name of rock	features of the rock
layers of mud and tiny dead animals compressed and turned into rock	granite	large interlocking crystals
magma cooling slowly underground in the Earth's crust	marble	crumbly, layered, containing fossils
limestone changed by heat and pressure	shale	hard, shiny, white with veins of colour, fizzes with acid

c. Sue was out tramping with her friend Aroha. She picked up a stone on the top of a mountain, looked out towards the coast and said, "One day, Aroha, this stone will be sand on that beach down there".

Explain the processes which cause the rock on the mountain to be changed into sand

Question TEN:

A Van der Graaf generator (pictured) builds up a negative charge on the large dome. When Ruth placed her hands on the dome, her hair began to 'stick up'.



- a. Discuss why the strands of hair on Ruth began to stick up on end.

- b. Ruth got off the Van der Graaf generator losing all her charge. Ruth was wearing a school jersey and had an inflated balloon. Describe how she could build up a charge on the balloon using her clothing.

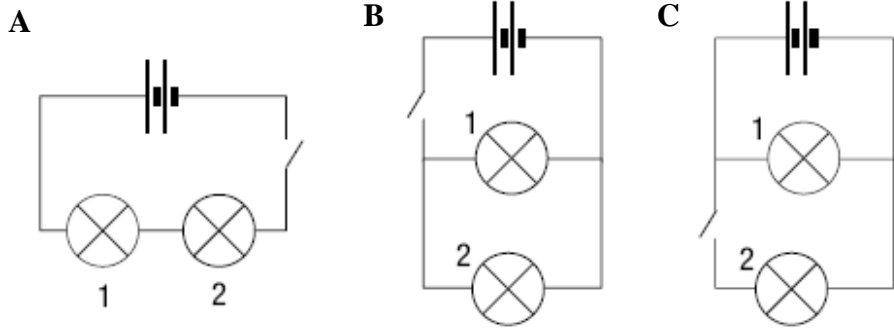
Question ELEVEN:

- a. Match the terms in the box below with their descriptions. (Not all words will be used)

Neutron	Conductor	Electrons	Insulator
Neutral	Atoms	Proton	

Term	Description
	A negative particle
	What matter is made of
	The neutral part of an atom
	Electrons can move through them
	Electrons cannot move through these
	A positive particle

b. Use the circuits below to answer the following questions



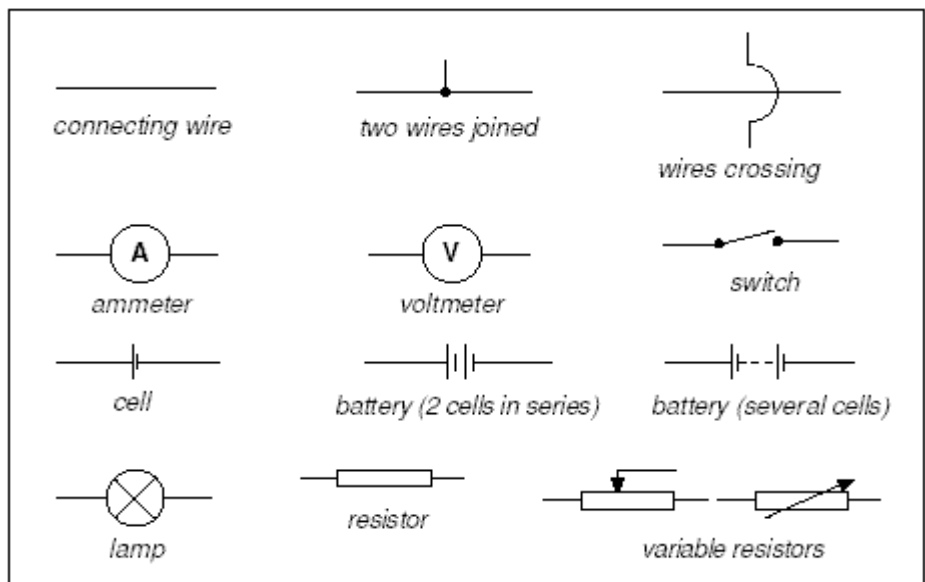
- i. Which circuit(s) is wired in series? _____
- ii. Which circuit(s) is wired in parallel? _____
- iii. In which circuit(s) will at least one bulb glow when the switch is **off** (open)?

Explain your answer:

- iv. In which circuit(s) will Bulb 2 go out when Bulb 1 is loosened? Switch is closed

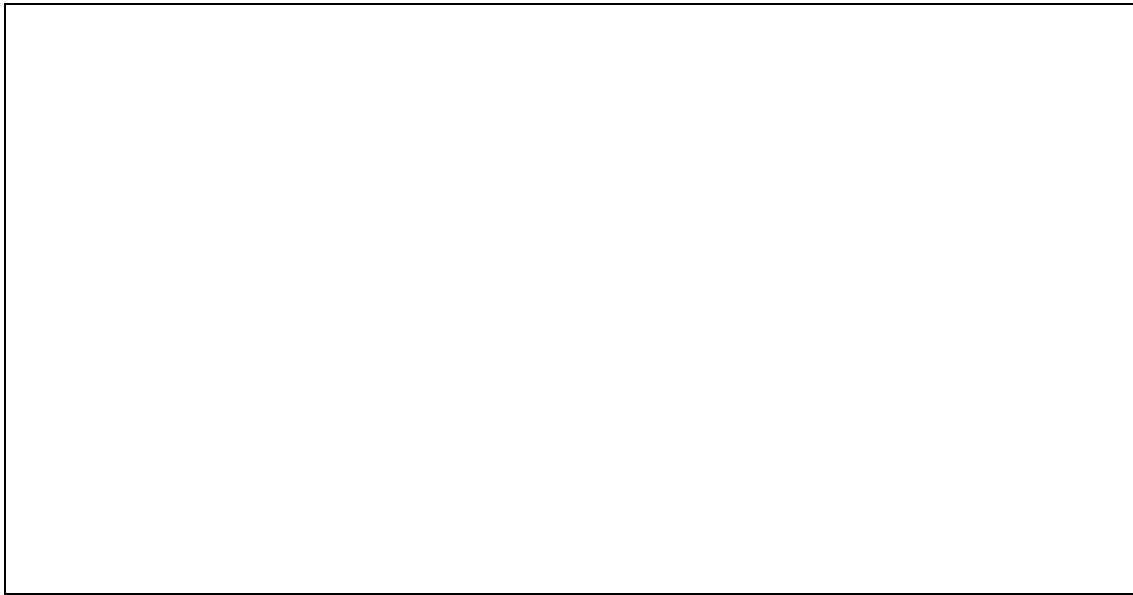
Explain your answer:

Using the circuit symbols provided draw the following circuits.



Sarah carried out an experiment to find out if materials were conductors or insulators.

- c. i. Draw a simple circuit diagram using a cell, wires, and a lamp that you could use to test whether each material was a conductor or insulator.



Below are the materials that she tested.

glass rod	eraser	nail
copper metal	silver spoon	plastic ruler

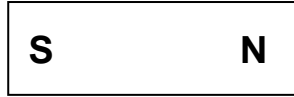
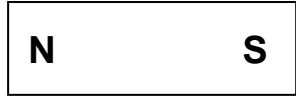
- ii. Using your knowledge of conductors and insulators, fill in the result table for all 6 things that she tested.

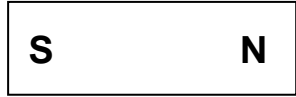
Conductors	Insulators

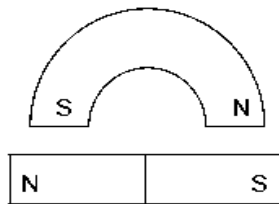
Question TWELVE

a. For each of the magnet pairs below decide if the magnets will be attracted or repelled.







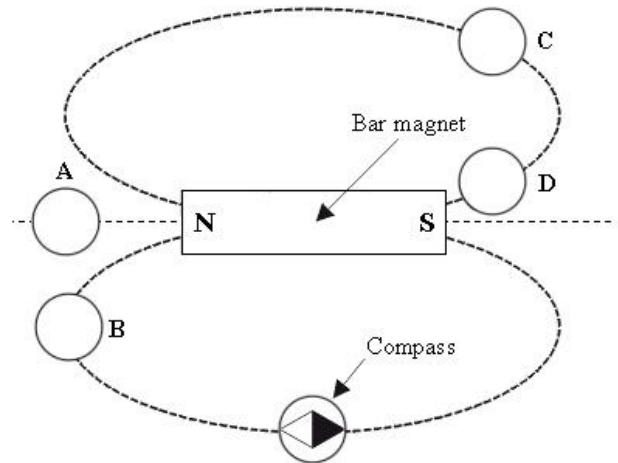


b. What is a magnetic field?

c. Peter was working out a line of magnetic force using a compass as an indicator of shape and direction for the magnetic field.

Which compass (1, 2, 3, 4 or 5) **BEST** fits at each of the four points A, B, C and D.

Write the numbers in the space below.



Magnet 1



Magnet 2



Magnet 3



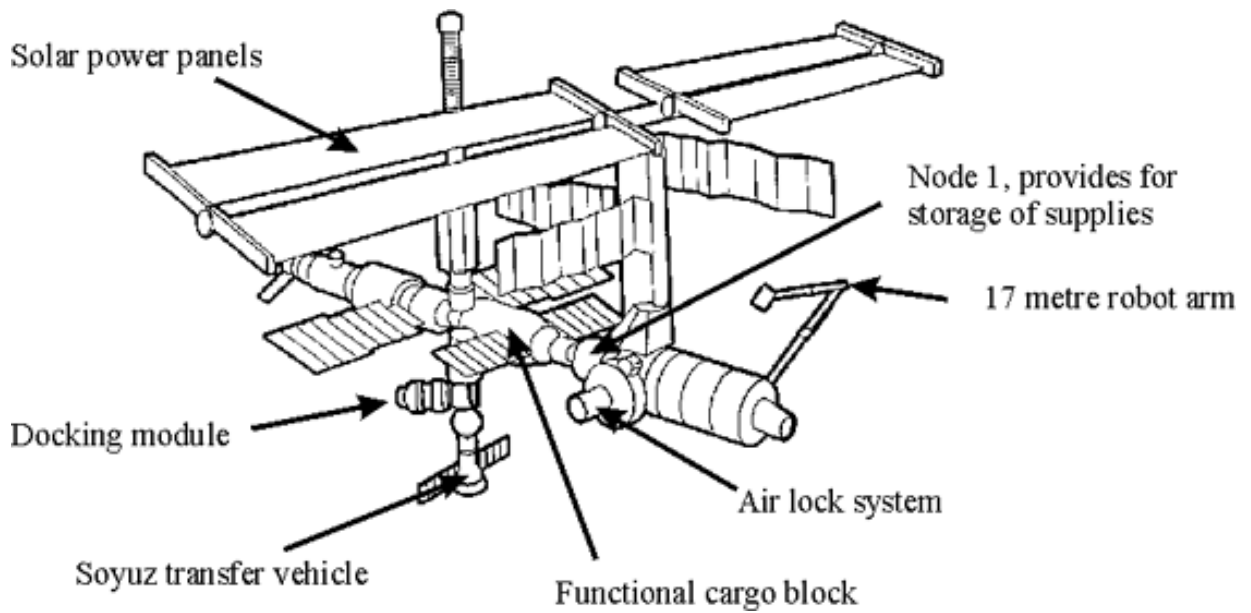
Magnet 4



Magnet 5

Position A	Position B	Position C	Position D
Magnet _____	Magnet _____	Magnet _____	Magnet _____

Question THIRTEEN:



In a joint space programme between the USA and Russia an International Space Station is to be built. The station will be built in sections beginning with the functional cargo block. This will provide control, propulsion, and power during the early stages of building.

Use the diagram and your own knowledge to answer the following questions.

- a. Give two examples of supplies that would be stored in Node 1 for the crew of the space station.

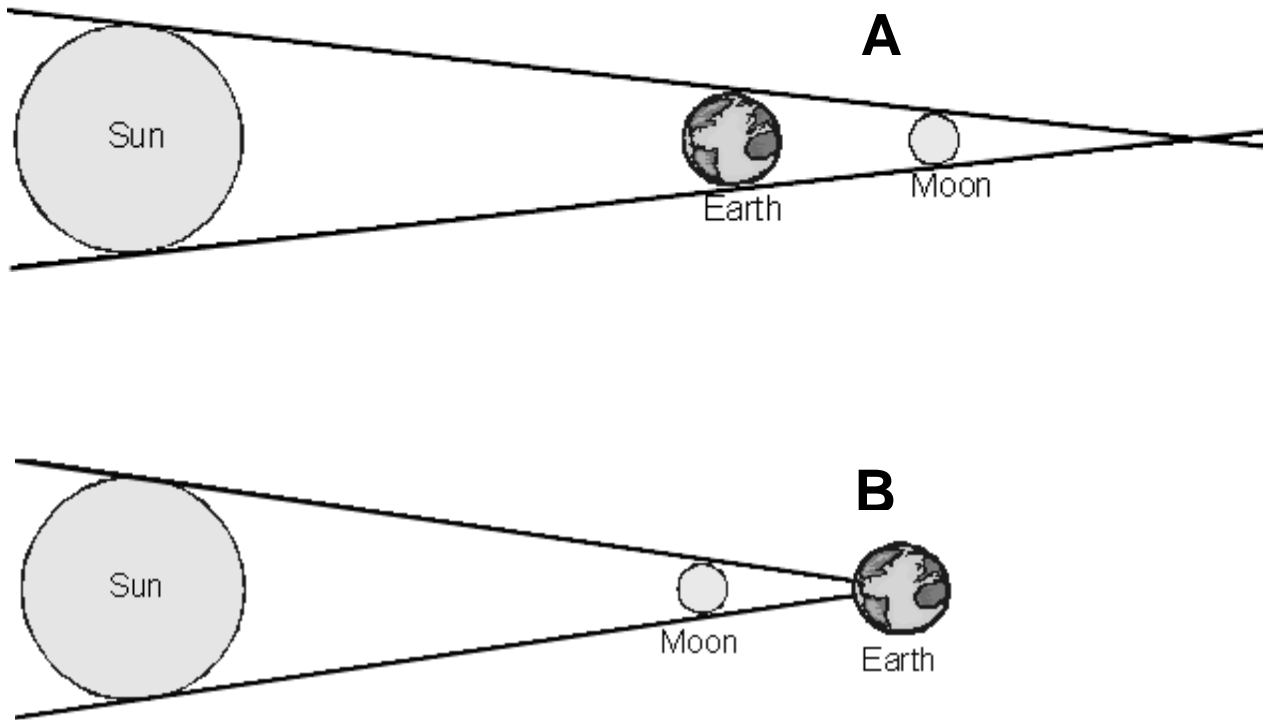
•

•

- b. Why would using the 17 metre robot arm make it safer for the crew?

Question FOURTEEN:

The diagrams below show an eclipse of the Moon and an eclipse of the Sun.



- a. Which diagram, A or B, represents an eclipse of the Sun: _____
- b. Explain what you would observe on Earth during a total eclipse of the sun.

Well Done. Do the next paper.