

NAME:	SCIENCE TEACHER:	10B
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SCIENCE

Year 10 Examination 2009

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.

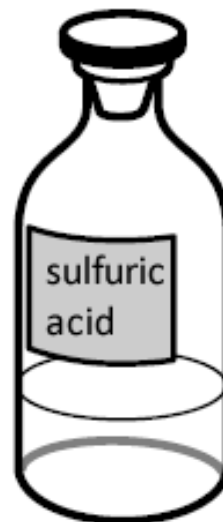
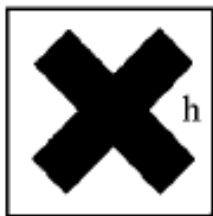
For Teacher Use

<i>Question</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	<i>Total</i>
<i>Marks gained</i>																	
<i>Marks available</i>	3	4	4	2	6	8	4	8	4	4	6	4	2	9	7	5	80

Question 1 (3 marks)

Sulfuric acid is a **corrosive** liquid. This bottle of sulfuric acid should have a hazard symbol on it.

- a. Circle the standard hazard symbol which should be placed on the bottle of sulfuric acid.

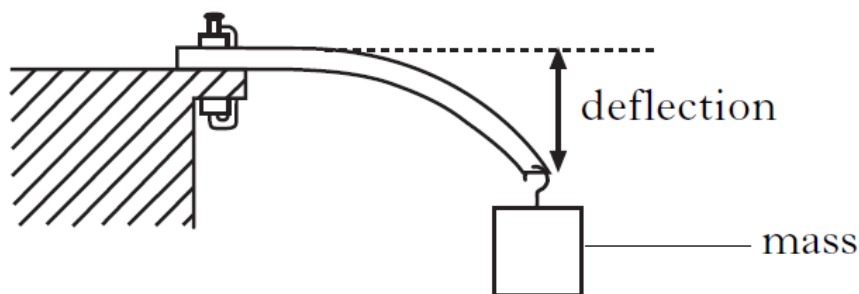


- b. Give a reason why a hazard symbol should be placed on the container of sulfuric acid.

- c. What should you do if you splash some acid in your eye?

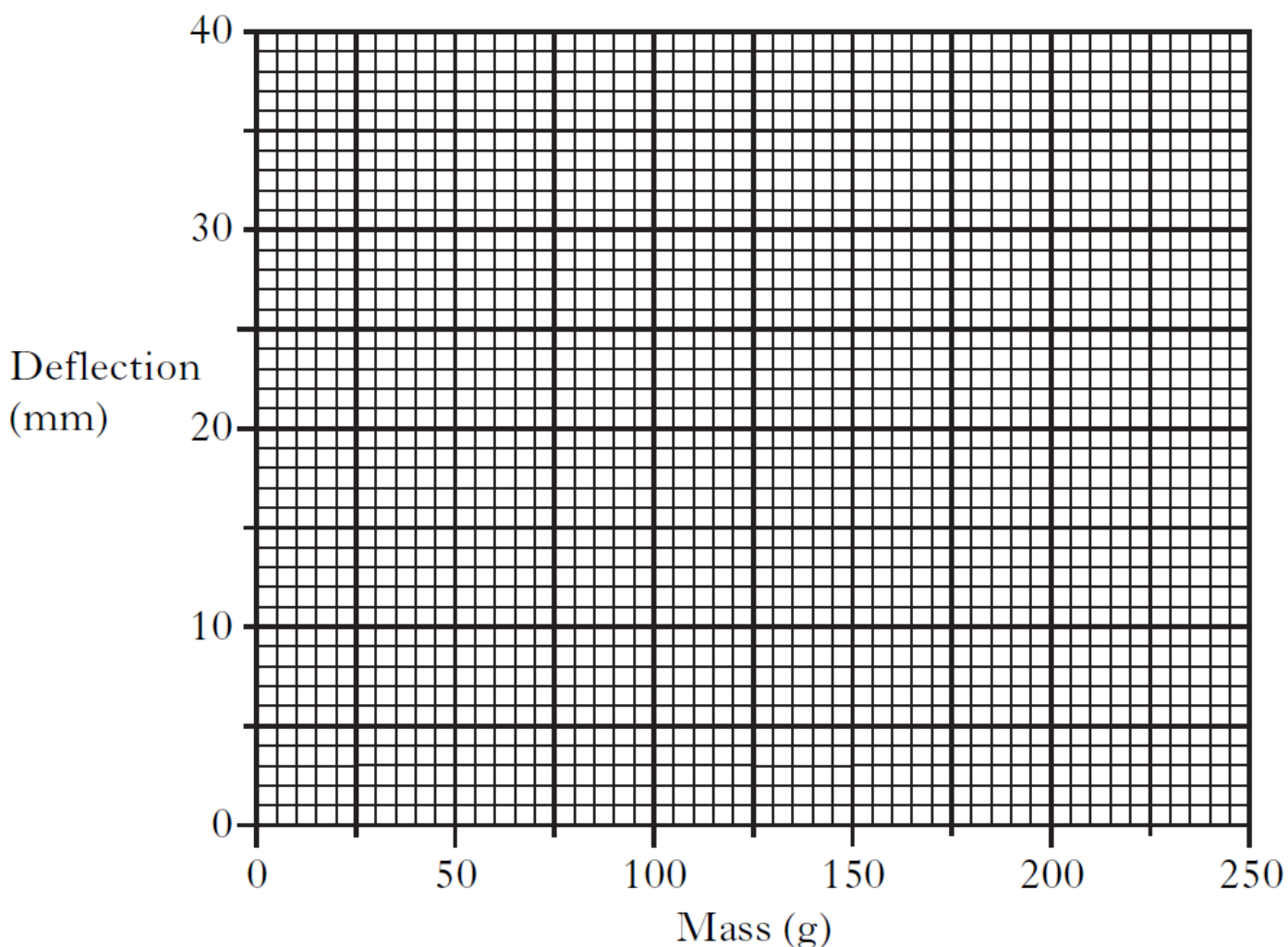
Question 2 (4 marks)

Scott was investigating the flexibility of steel. He clamped a steel strip to a bench. He hung different masses from the end of the steel strip and measured its deflection. His results are shown in the table.



Mass (g)	0	50	100	150	200	250
Deflection (mm)	0	7	13	19	26	32

a. Use these results to draw a **line** graph.



b. Write **one** conclusion you can make from these results.

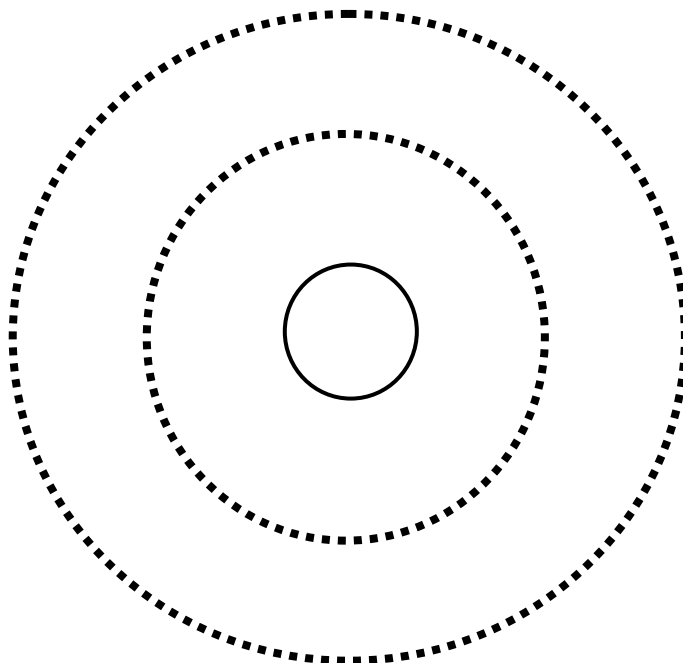
c. From your graph predict the deflection if a 75 g mass is hung on the end of the steel strip.

Question 3 (4 marks)

a. Complete the table below by filling in the missing information.

Element	Number of protons	Number of neutrons	Number of electrons	Electron arrangement
Nitrogen	7	7		2,5
Aluminium	13	14	13	
Argon		22	18	2,8,8

b. Complete the diagram below showing where the electrons are in a nitrogen atom.



c. Circle the correct formula for the following chemicals:

Circle only one from each line

i	Water	HO ₂	H ₂ O	HO
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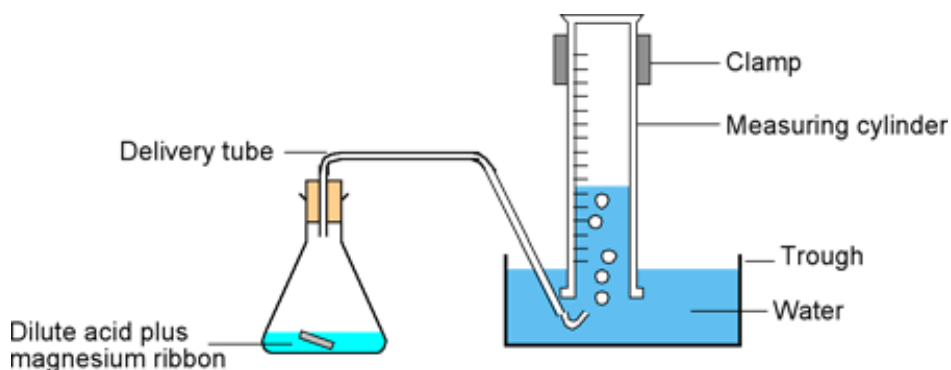
ii	Carbon dioxide	CO ₂	C ₂ O	CO ²
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iii	Sulfuric Acid	H ₂ SO ₄	H ₂ SO ₄	HSO ₄
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iv	Hydrochloric Acid	CLH	HCL	HCl
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Question 4 (3 marks)

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 measuring cylinder.



a. Give two observations that would indicate a chemical reaction had taken place.

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b. Write the word equation for this reaction in the box below showing all reactants and products.

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Question 5 (6 marks)

a. Some descriptions of common elements are given in the box below.

• Hydrogen	• Oxygen	• Copper
• Sodium	• Neon	• Mercury

Complete the table below by adding the name of the element, from the box above that best fits the description.

Description of element	Name of element
A metal that is liquid at room temperature	
A gas that relights a glowing splint	
An colourless gas, which is unreactive	
A colourless gas which burns with a squeaky pop	

b. Jane used universal indicator paper to find the pH of some common substances. These are her results.

Substance	pH
Battery acid	2
Dishwasher powder	11
Distilled water	7
Lemon juice	3
Oven cleaner	10
Rain water	6.5
Salt water	7
Shampoo	8

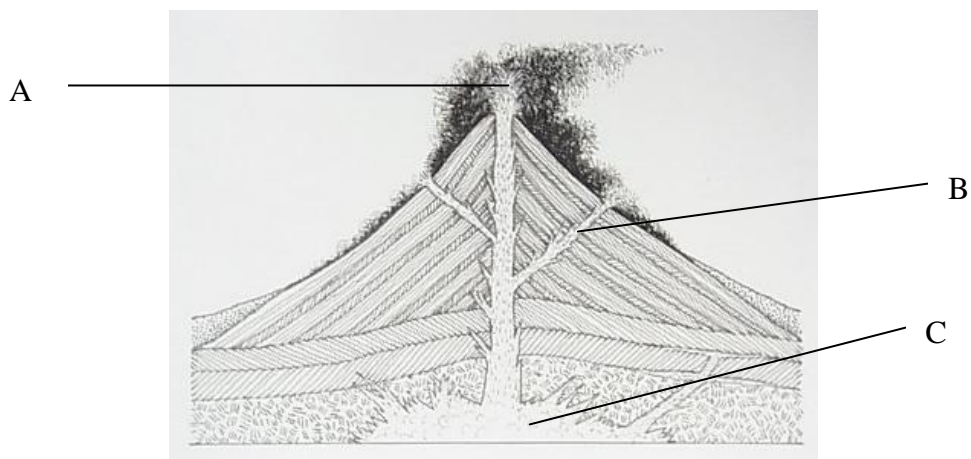
Classify the substances as **acidic**, **basic**, or **neutral** in the table below.

Acidic	Basic	Neutral

- c. Which substance is the **most** basic? _____
- d. Joy wanted to test if an acidic solution will clean rusty nails. First she had to be sure the solution she was using was acidic. Write a step by step method, describing what she would do to test if a solution is acidic or not?

Question 6 (8 marks)

- a. Label the following parts of a volcano:



Letter	Name of part
A	
B	
C	

- b. Three different substances can be exploded from the top of a volcano; lava, lahars or pyroclastic flows. Describe **TWO** of these different substances and discuss the effect they can have on the surrounding area.

Name of substance	Description	Effect

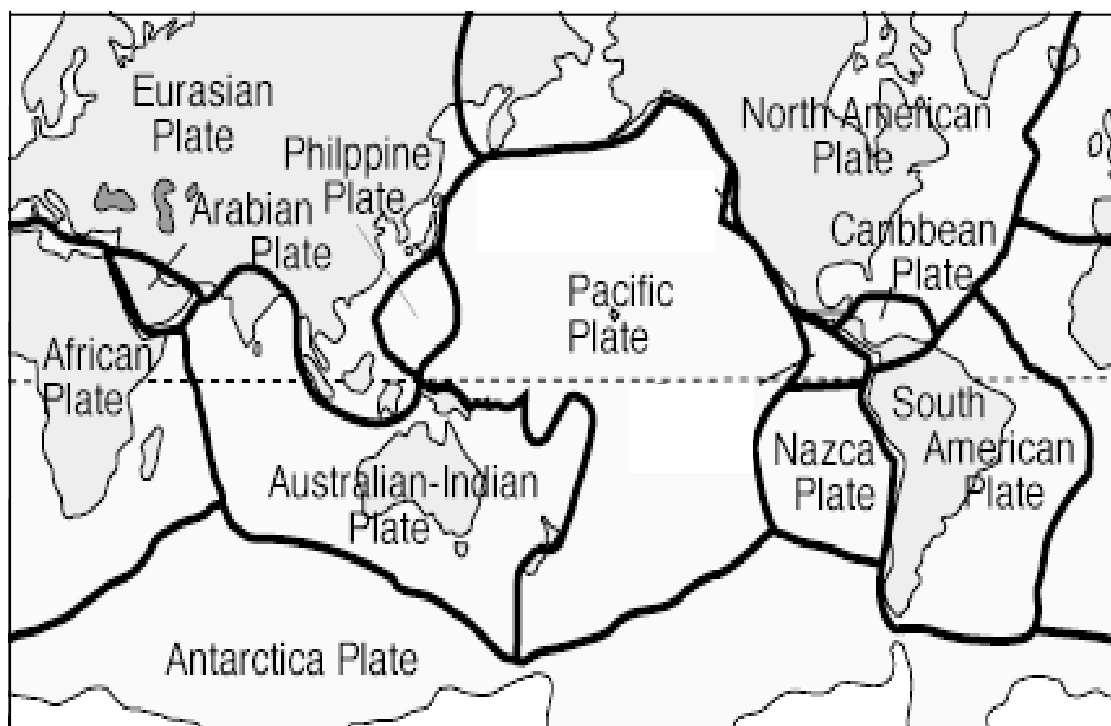
c. Volcanoes can be **dormant, extinct or active**. Define these terms and give a **New Zealand** example for each. Choose from the box below

• White Island	• Taranaki	• Ruapehu
• Taupo	• Auckland Volcanic Field	• Ngauruhoe

Dormant:
e.g.
Extinct:
e.g.
Active:
e.g.

d. By interpreting the map below, state the names of the two plates that New Zealand lies on the boundary of.

•	•
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- e. Explain why there are many active and dormant volcanos in New Zealand and all around the edge of the Pacific Ocean. (In fact the edge of the Pacific Ocean has become known as the “Ring of Fire”)

Question 7 (4 marks)



Jo 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".

- a. Describe **TWO** ways that Jo's stone could be broken down by weathering before it reaches the beach.

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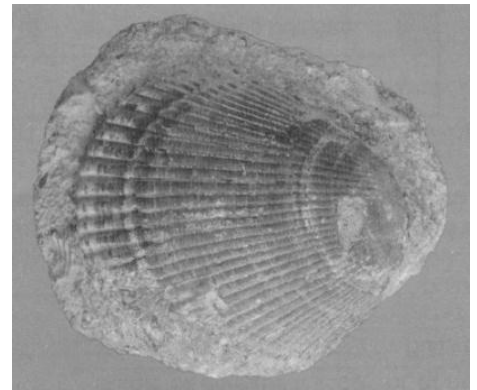
- b. What is the **most** likely way stones would "move" from the tops of mountains to the coast?

Question 8 (8 marks)

Over many years, cliffs may be affected by weathering.

a. The photograph shows a piece of sandstone.

i. The sandstone in the photograph contains a fossil. Explain how fossils are formed.



ii. What group of rocks does sandstone belong to? Circle your answer.

- Igneous
- Metamorphic
- Sedimentary

b. Granite and basalt are igneous rocks. They contain crystals but **no** fossils.

i. How are igneous rocks formed?

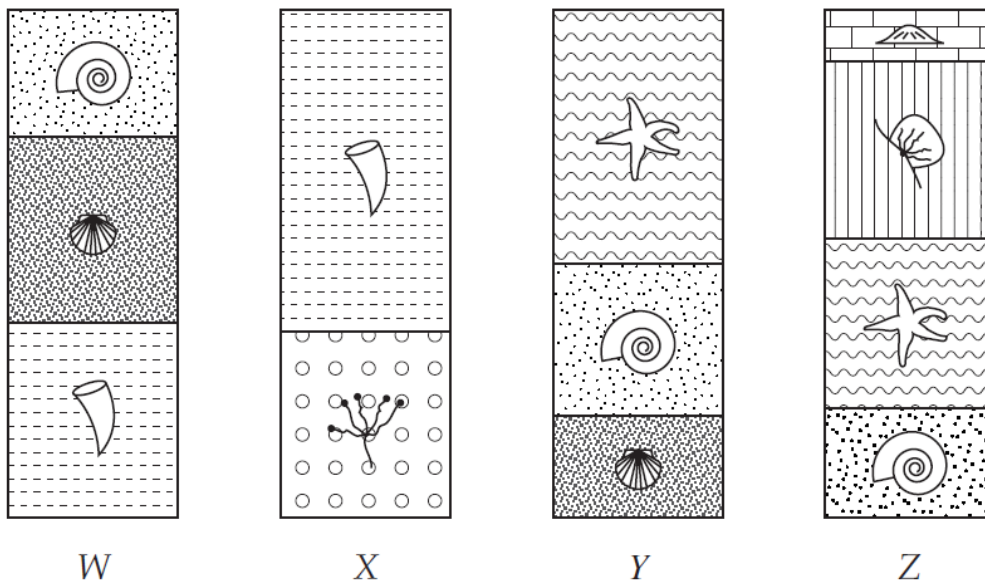
ii. Explain why igneous rocks do **not** contain fossils.


iii. Granite takes much longer to form than basalt.

How will the size of the crystals in granite be different from the size of the crystals in basalt?

c. Use the diagram to answer the following questions.

The diagram illustrates the fossils found at four different locations W, X, Y and Z.



i. Which of these fossils is younger than fossil ?  Circle your answer.



ii. At which location was the oldest fossil found? Circle your answer

W X Y Z

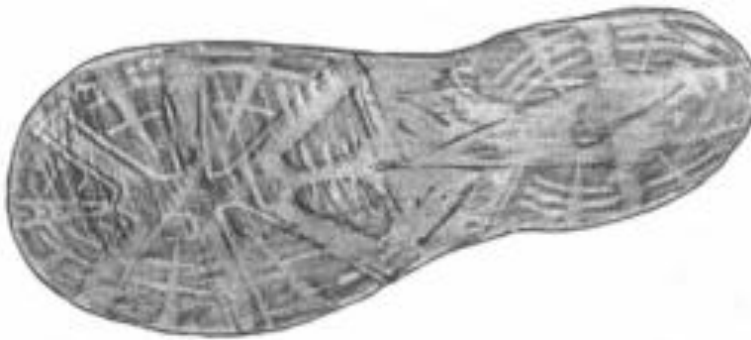
iii. In which of the following environments would these fossils most likely have formed? Circle your answer

- A Coastal lake
- B Rain forest
- C Fast-flowing river
- D Sandy desert

Question 9 (4 marks)

Shoeprints are often found at the scene of the crime.

The shoeprint shows a shoeprint left at the crime scene in damp soil.



a. Describe how to make a cast of the shoeprint found in an area of damp soil.

b. As well as a cast, what other method might be used at the crime scene to make a permanent record of the shoeprint?

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c. Features from the cast are used to match the shoeprint with a suspect's shoes.

Give **three** features from the cast that might be used in this way.

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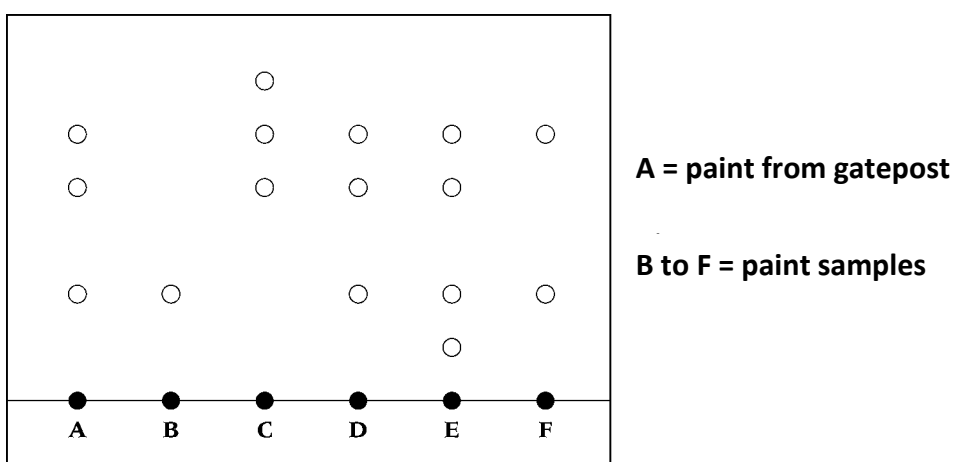
Question 10 (4 marks)

Police were called to 10 Manor Road because there had been a burglary. There were some bits of red paint on the gatepost, and the police suspect that the robbers' car or van scraped against the gatepost when they were making their getaway.

A forensic science laboratory was asked to find out what make of car the burglars had used. Different car manufacturers use different mixtures of colours in their paint. The scientists used chromatography to find out the make of the getaway vehicle.



These are the results of the tests:



a. Which manufacturer (or manufacturers) used one pure colour in their red paint?

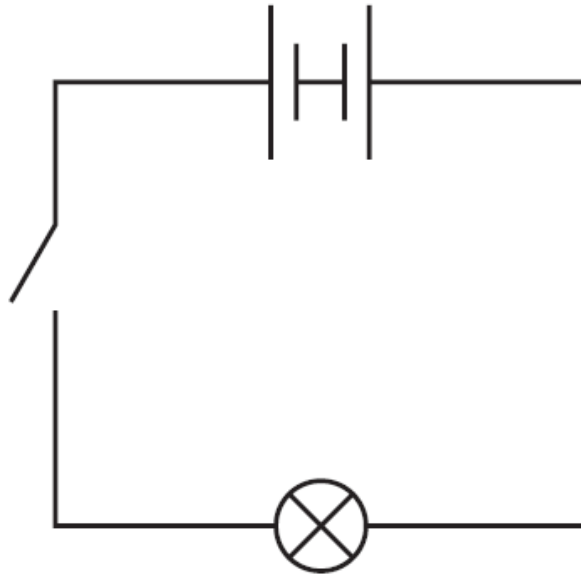
b. Which manufacturer (or manufacturers) used a mixture of only two colours?

c. i. Which manufacturer uses the same paint as the paint from the gatepost?

ii. How did you decide?

Question 11 (6 marks)

The doctor wants to use a small torch to look down the student's throat. When he closes the switch to turn the torch on, it does not work. Below is the circuit diagram for the torch.

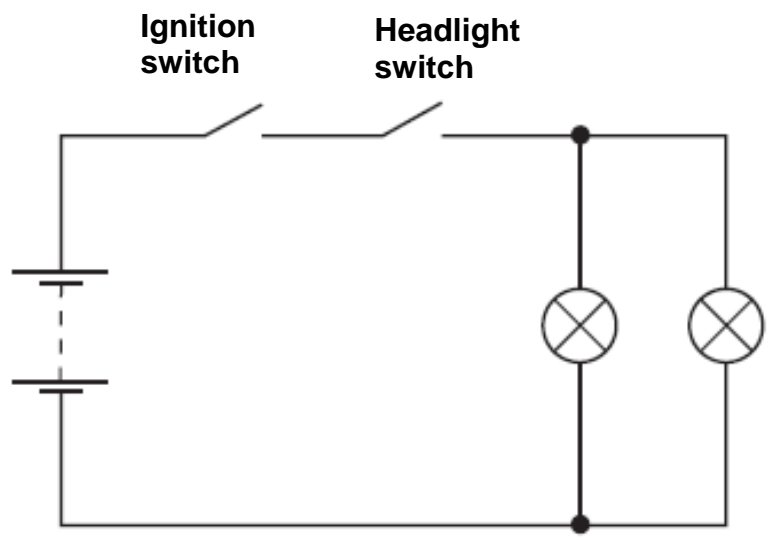


a. Explain what is wrong with the torch.

b. Draw the correct circuit diagram.

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- c. Cars have many different electric circuits. This circuit shows how the headlights are connected.



i. Are the **switches** connected in series or parallel? _____

ii Give a suggestion why the switches are connected in this way.

d. The headlights are connected in parallel. Give TWO advantages of this arrangement.

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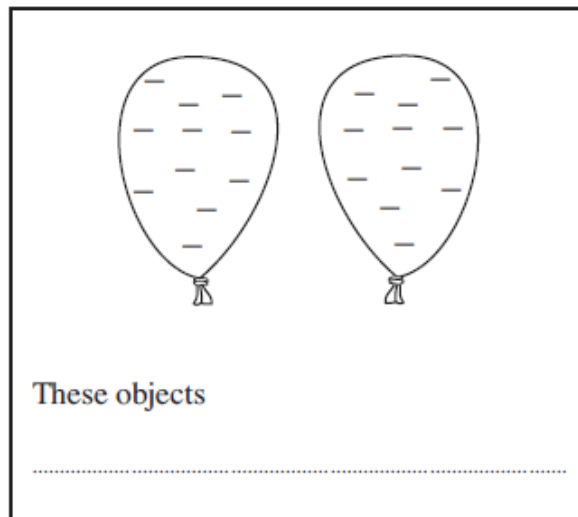
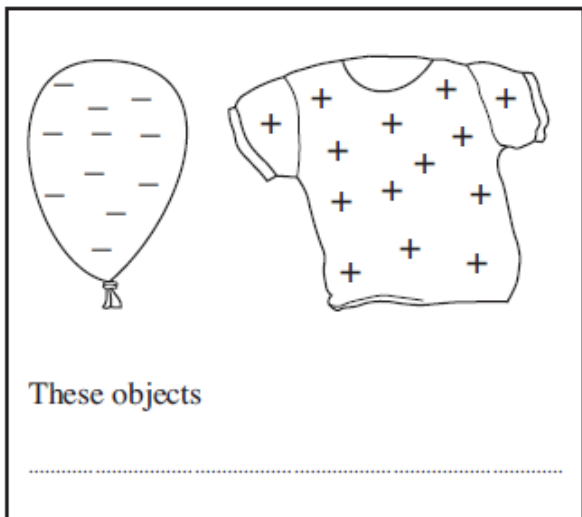


Question 12 (4 marks)

a. When a balloon is rubbed on a jumper, the balloon becomes negatively charged with static electricity.

i. Which particles, **protons**, **electrons** or **neutrons**, have moved from the jumper to the balloon?

ii. In each of the boxes below, complete the sentences to say whether the objects **repel**, **attract** or **do nothing**.



b. Static electricity is used when paint spraying car bodies.

The car body is given a positive charge.

The paint droplets are given a negative charge.

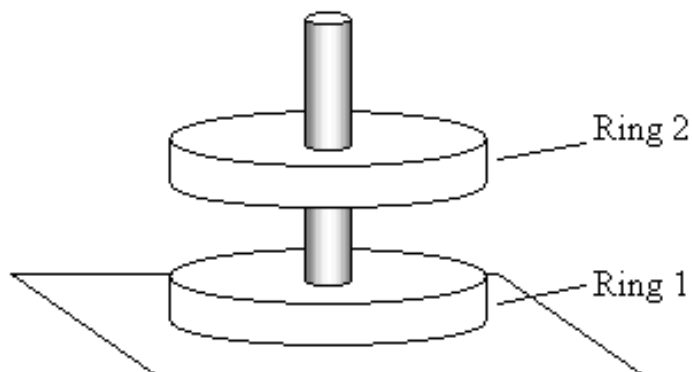


Give **two** advantages of making all the paint droplets negatively charged.

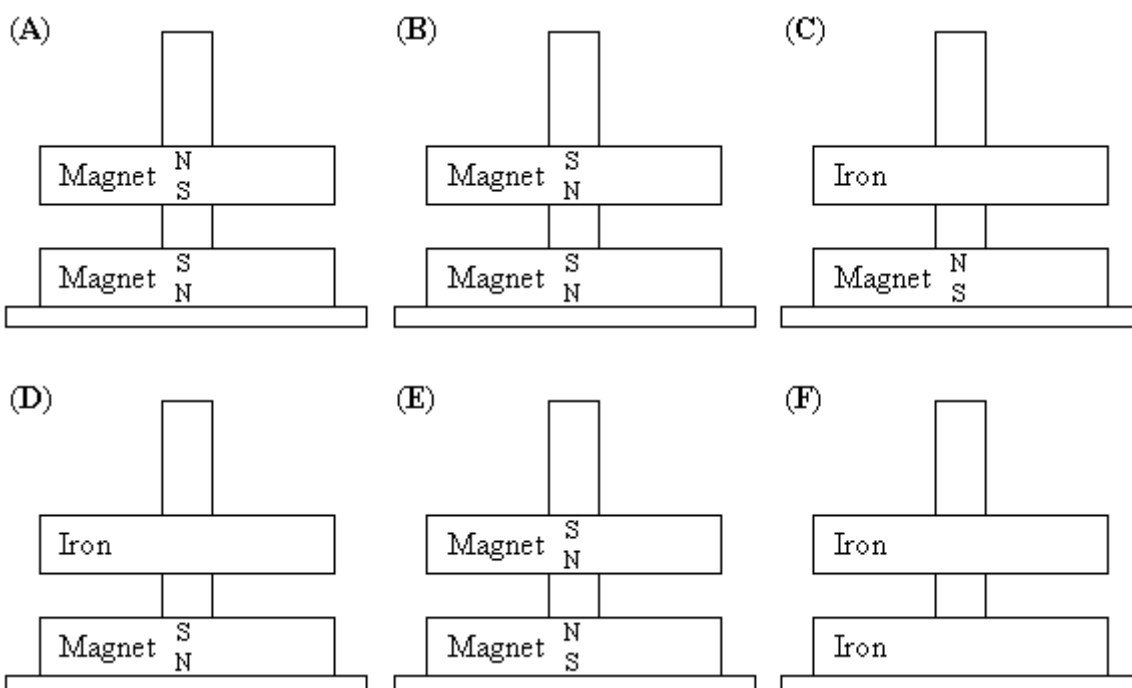
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Question 13 (2 marks)

This is a diagram of a child's toy. Each ring has a magnet inside, so ring 2 seems to "float" above ring 1.



- a. Which of the following diagrams show how the toy could be made. (Circle the letter for the answer/s you think are true).

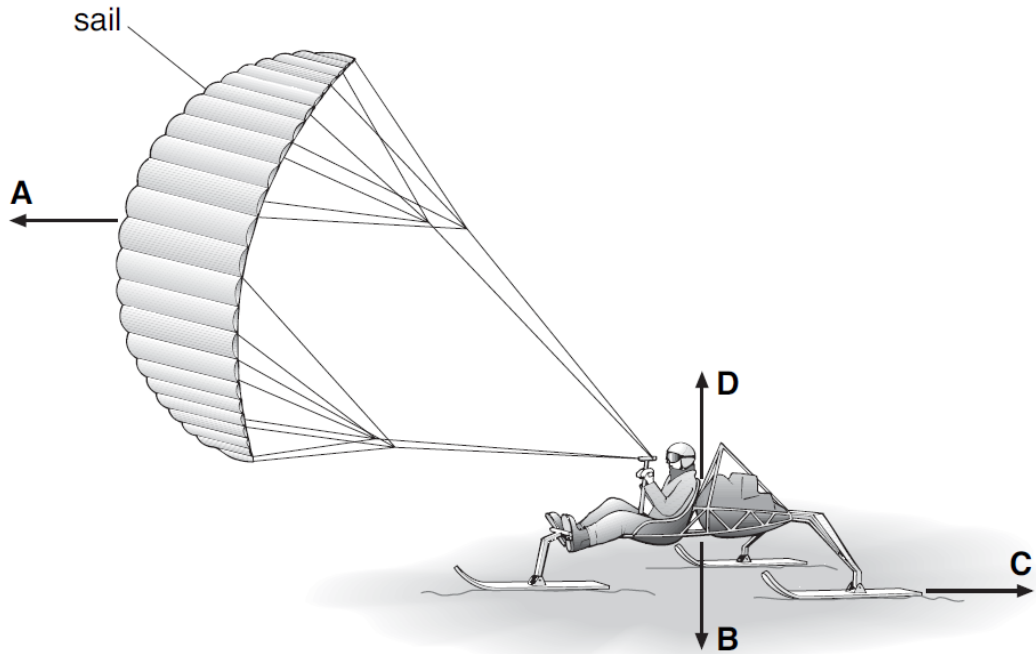


- b. Explain why the top ring "floats" above the bottom ring.

Question 14 (9 marks)

- a. The drawing shows a snow-buggy being pulled by a sail. The buggy rests on three skis on the snow.

The drawing shows four forces that act when the snow-buggy is moving.

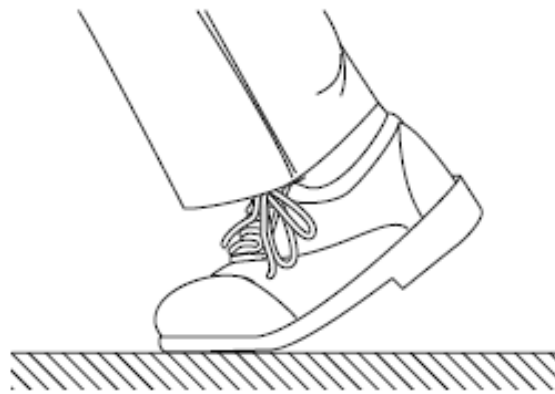


Draw a line from each force in the list below to the correct letter from the diagram. Draw only **three** lines.

force	letter
the weight of the buggy	A
the force pulling the buggy along	B
the friction between the skis and the snow	C
	D

- b. Describe **one** way the snow-buggy could be changed to make it travel faster.

A force makes the bottom of shoes grip the ground as we walk forwards.



c. What is the name of this force? _____

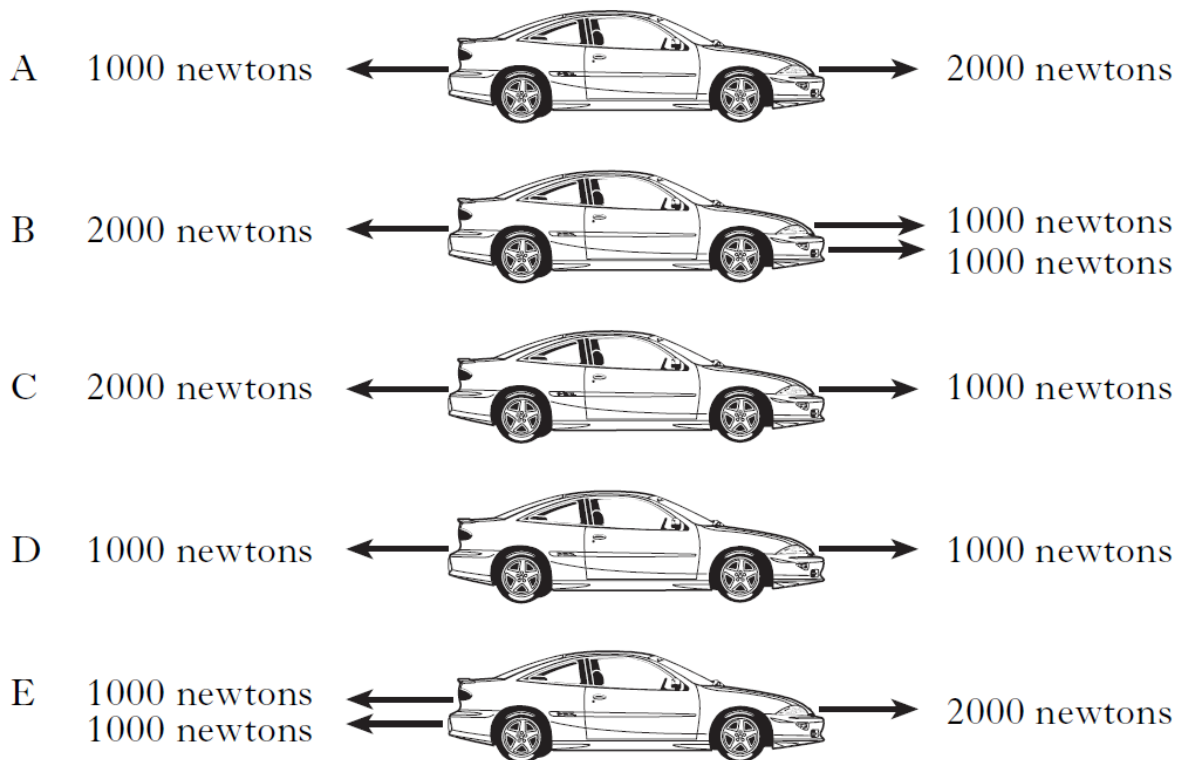
d. In which direction is this force acting in the diagram? **Circle your answer.**

A down (↓) B left (←) C up (↑) D right (→)

e. With the **help of a suitable diagram**, write a step by step method, describing how you would carry out an investigation to find out which pair of your shoes has the best grip. You can use normal scientific equipment found in the laboratory.

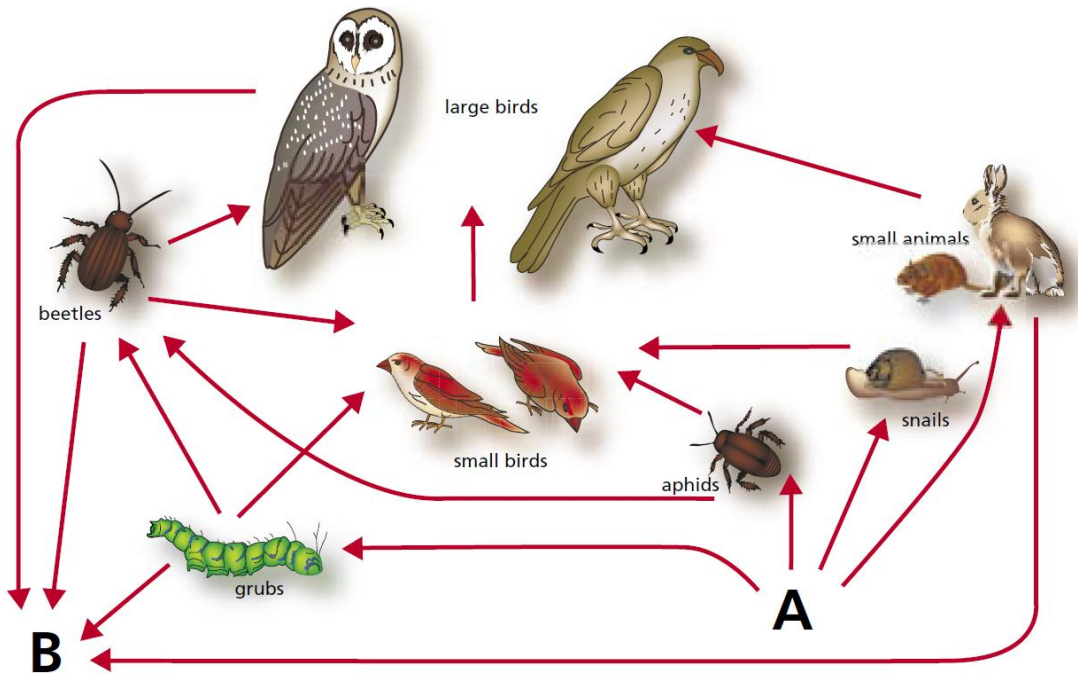
- f. Every school holidays the school cleaner at Hogwarts polishes the linoleum in the corridors and for the first few days of the new term students slide along the corridors in their socks. After students have been walking on the floor for a few days it becomes more difficult to slide and the students gave up their sliding games. Explain this in terms of force and friction.

- g. i. Five cars are acted on by different forces. Which of the cars is speeding up to the right? **Circle your answer.**



- ii. Why did you choose this answer?

Question 15 (7 marks)
 Look at the food web below.



a. What type of living thing would A be in this food web? Give a reason for your answer.

b. Write out **TWO** food chains from this food web.

- c. From this food web identify the following: a herbivore, a carnivore, a predator, two organisms that compete with one another for food, and a third-order consumer.

A herbivore	
A carnivore	
A predator	
Two organisms that compete for food	
A third-order consumer	

- d. i. What type of organism would B be in this food web?

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- ii. Why are these organisms important?

Question 16 (5 marks)

An investigation was carried out into the effect of the levels of three environmental factors on the distribution of woodlice.

The factors investigated were the availability of food, light intensity and predation.

The table shows the results of the investigation.

		Number of woodlice		
		Food supply	Light intensity	Predation
Environmental factor	Level			
	High	120	3	5
	Medium	66	17	30
	Low	14	180	165

- a. Which of the environmental factors investigated is an abiotic factor? _____

- b. Use the words **high**, **medium** and **low** to describe the combination of environmental factors which would result in the highest number of woodlice in an area.

Each word can be used once, more than once or not at all.

_____ food supply
_____ light intensity
_____ predation

- c. Beetles living in the same area are in competition with the woodlice. What does the term “competition” mean?

- d. i. What might happen to the number of woodlice if the number of beetles increases?

- ii. Give a reason for your answer.



Now do Paper A or C