

NAME:	SCIENCE TEACHER:	<b>9B</b>
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# SCIENCE

## Year 9 Examination 2009

**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.

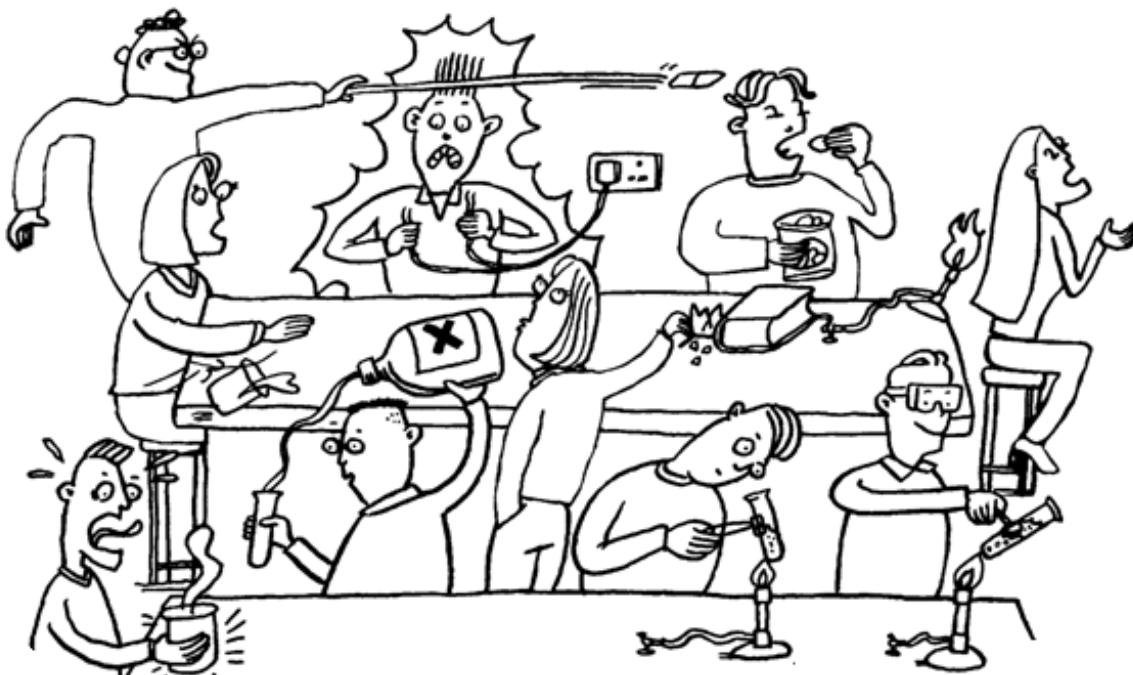
Give units for all answers (eg kg or m) unless they are already provided.

*For Teacher Use*

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
Marks gained																		
Marks available	4	5	2	5	2	5	5	4	6	3	6	5	4	3	5	7	9	

**Question One. [4 marks]**

You will usually find a set of 'Lab Rules' in a science lab. They are there for your safety! The drawing below shows a lab where there are no safety rules.

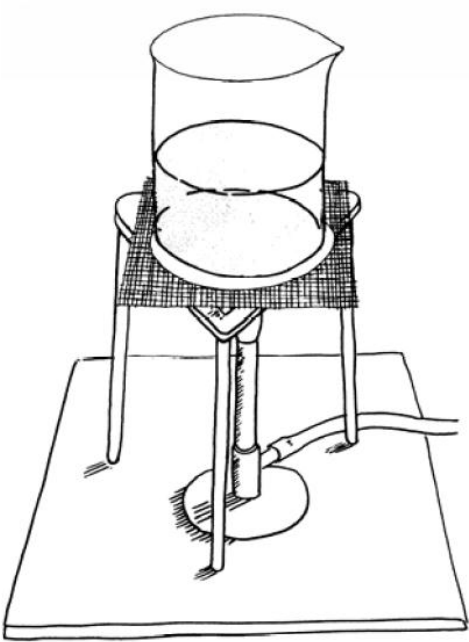


Circle TWO things that are dangerous and number them 1 and 2. Write down why they are dangerous. For each of your answers, write a safety rule.

Number	Why it is dangerous	Safety rule
1		
2		

**Question Two. [5 marks]**

- (a) Draw using the correct scientific symbols, a diagram to show a beaker of water being heated. Don't forget to include labels.

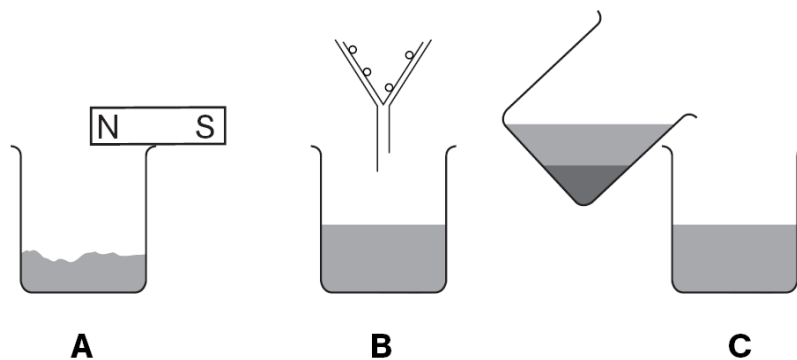
Picture	Labelled 2-D scientific diagram
	

- (b) Name the item(s) of science equipment, in a lab, that can be used to:

- (i) mix large amounts of liquids together
- (ii) heat small amounts of liquid safely
- (iii) measure small volumes of liquid
- (iv) hold 2 or more test-tubes
- (v) support equipment
- (vi) heat small amounts of powders


**Question Three. [2 marks]**

The diagrams show three ways of separating mixtures.



Which is the best method (way) of separating these mixtures? Choose A, B, or C. Write the correct letter in each box.

Mixture	Method
copper filings and water	
oil and water	
iron filings and salt	
sand and sea water	
copper filings and iron filings	

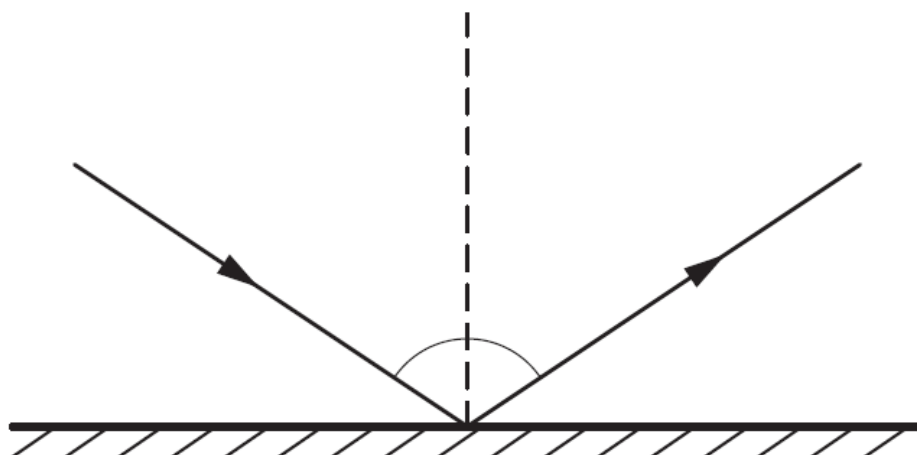
**Question Four. [5 marks]**

(a) Label the following diagram showing the reflection of a ray of light.

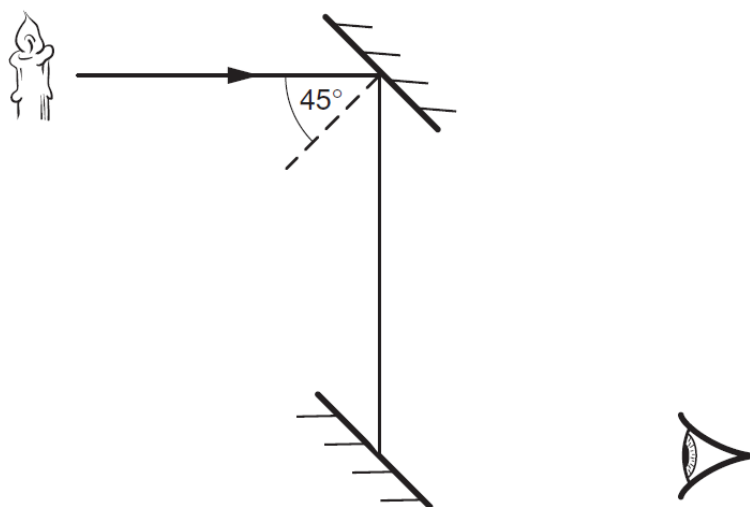
normal  
angle of incidence

incident ray  
angle of reflection

reflected ray  
plane mirror



- (b) This diagram shows a periscope. Finish drawing in the rays of light to show how the person can see the candle.

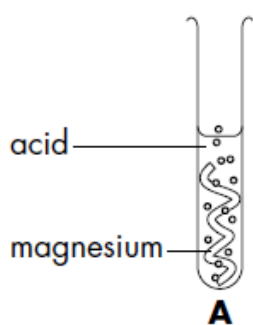


- (c) Complete these sentences. Choose words from the brackets.

Light is \_\_\_\_\_ (refracted/reflected) by the mirrors in the periscope. A person looking through the periscope sees an image that is \_\_\_\_\_ (the right way up/upside down).

### Question Five. [2 marks]

The drawings all show signs that a chemical reaction is taking place. Tick the boxes in the table for signs of each chemical reaction. Some reactions have more than one sign.



Sign of a chemical reaction	A	B	C
Bubbles are formed			
There is a colour change			
There is a smell			
Heat is given out			
Light is given out			
Something disappears			

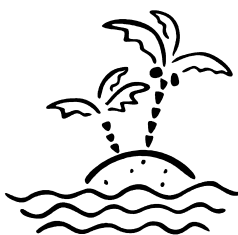
**Question Six. [5 marks]**

(a) Are these things solids, liquids or gases? Write the correct word for each one.

bricks



the sea



steam



milk

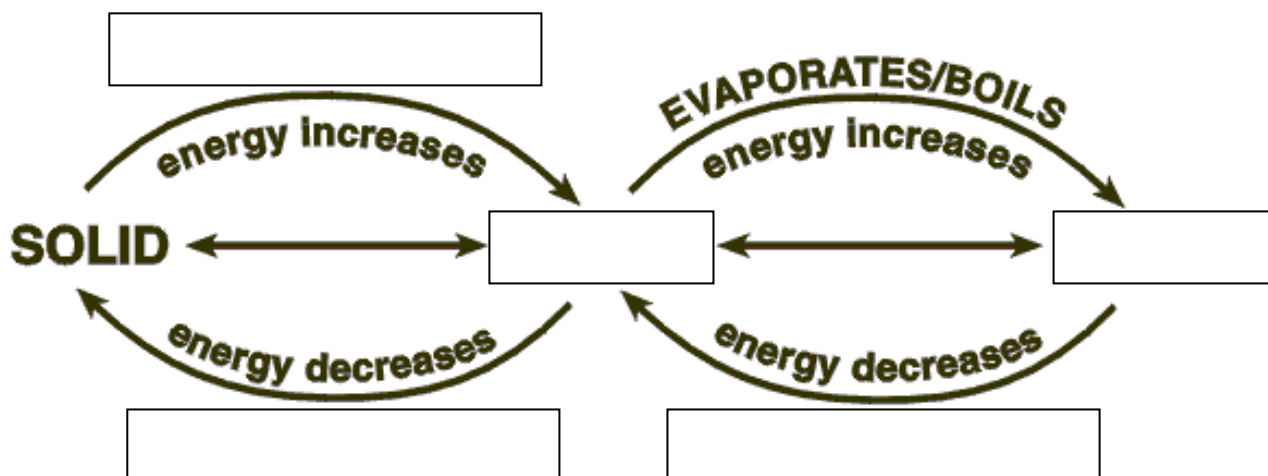


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(b) We can tell if a material is a solid, a liquid or a gas by the way it behaves. Tick the columns in the table to show which are the properties of solids, liquids and gases. One has been started for you.

Property	Solid	Liquid	Gas
Fixed shape	✓		
Fixed volume			
Easy to squash			
Flows easily			

(c) Complete this diagram showing the changes of state

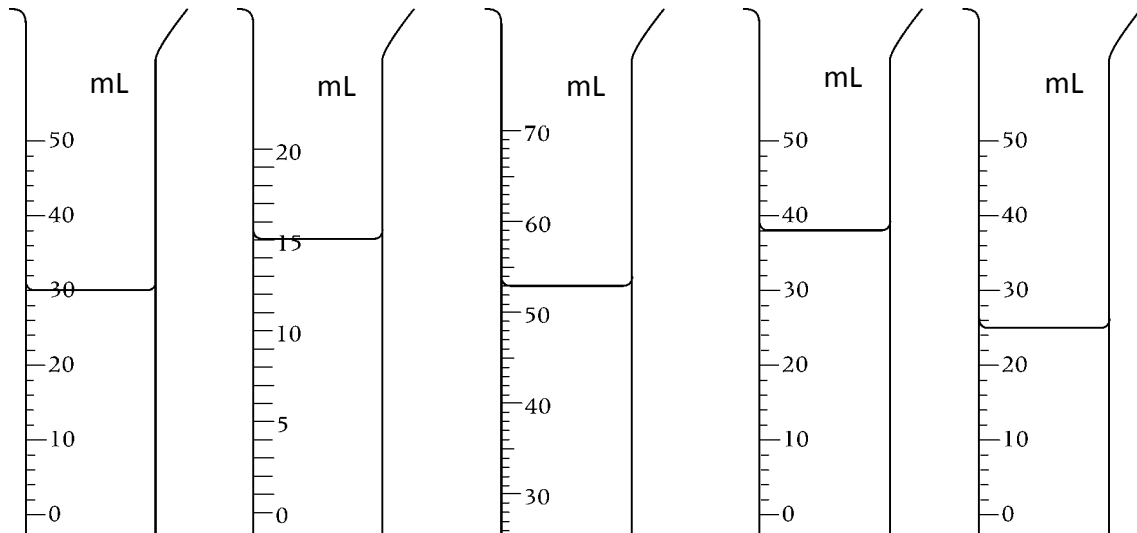
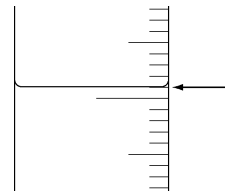


**Question Seven. [5 marks]**

- (a) For each of the following statements, write in the **correct units** used so that the sentence makes sense.

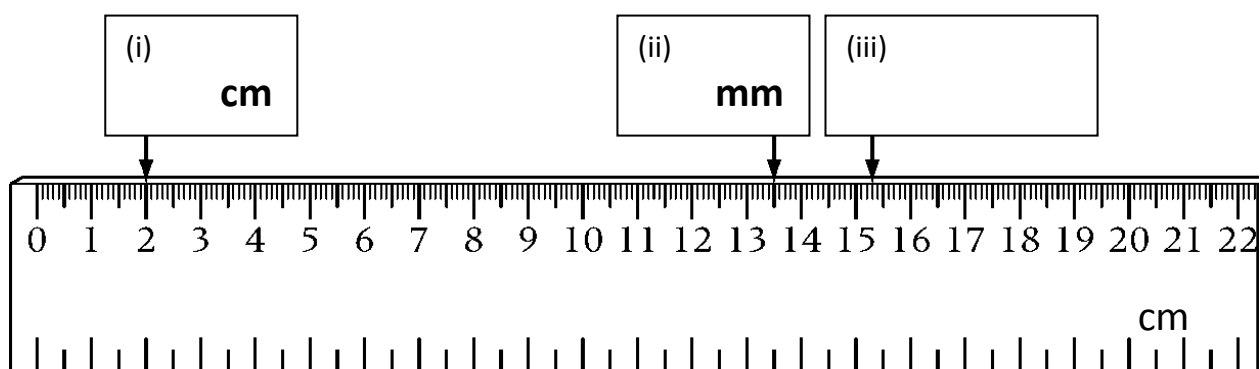
- |                                   |                                 |
|-----------------------------------|---------------------------------|
| (i) A baby has a mass of 3975 cm. | A baby has a mass of 3975 _____ |
| (ii) I drank 1.0 m of water.      | I drank 1.0 _____ of water.     |
| (iii) In 1 hour, Tama ran 4 kg.   | In 1 hour, Tama ran 4 _____.    |
| (iv) Mary has a height of 163 s.  | Mary has a height of 163 _____. |

- (b) How much liquid is in these measuring cylinders? Remember to read from the bottom of the meniscus, like this:



mL	mL	mL	mL	mL
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- (c) What are the readings shown by the arrows?

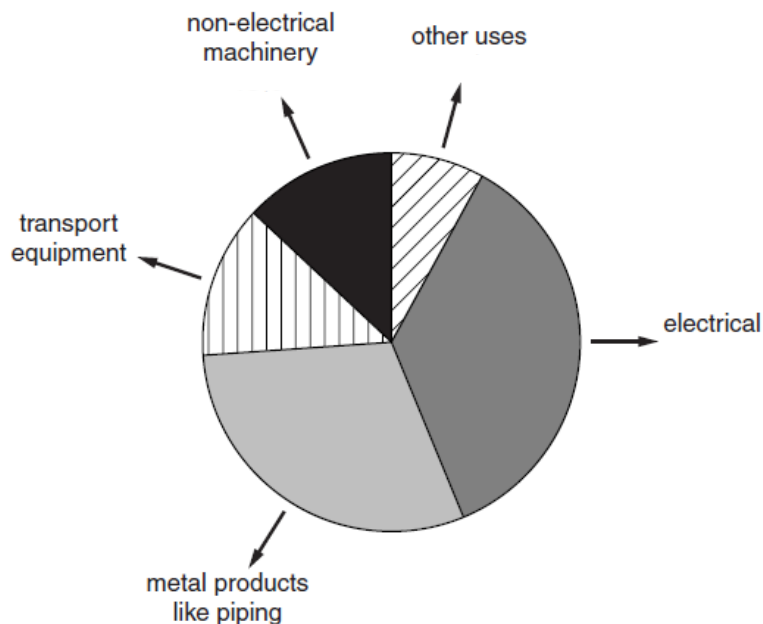


**Question Eight. [4 marks]**

The pie chart shows the uses of copper.

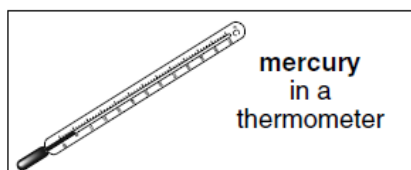
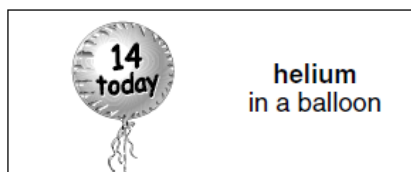
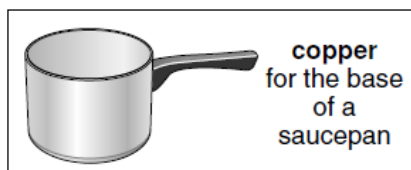
- (a) What is the chemical symbol for copper? Circle your answer

C Co Cu CU Cp



- (b) What is the largest use for copper?

- (c) The drawings below show that different elements are used for different objects. Draw a line from each element to the reason for using that element. Draw only **four** lines.



It is lighter than air.

It is a good conductor of heat.

It is a good conductor of electricity.

It stays shiny because it does not react with oxygen.

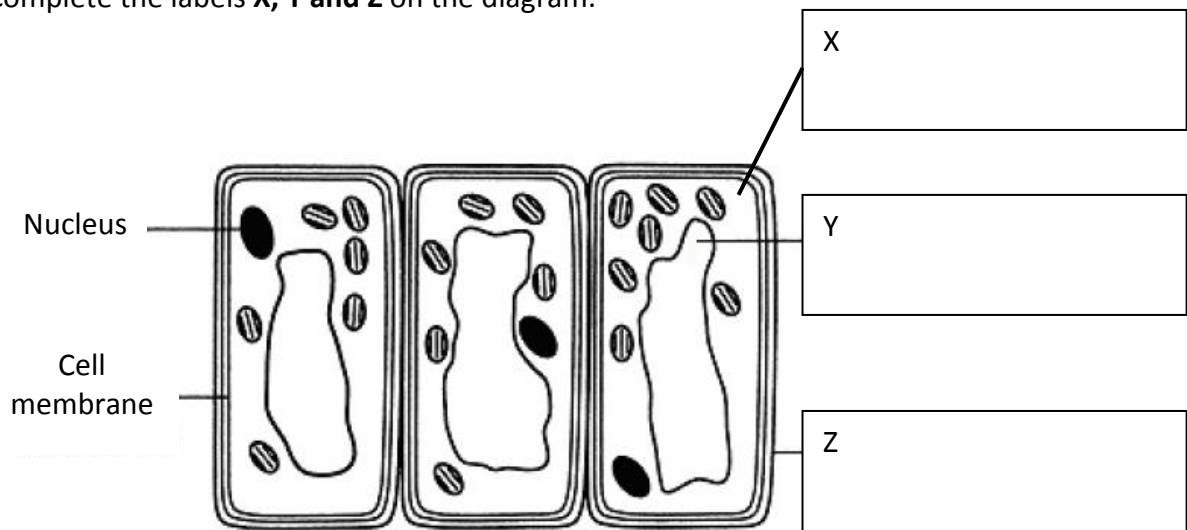
It is a liquid at room temperature.



**Question Nine. [6 marks]**

This question is about plant cells. The diagram shows some cells from inside a green leaf of a tree.

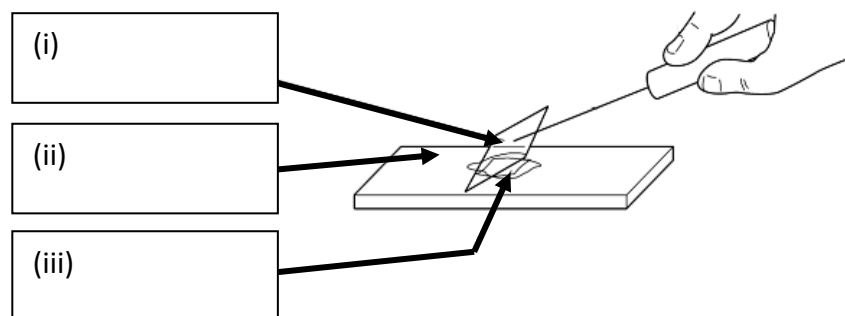
- (a) Complete the labels **X**, **Y** and **Z** on the diagram.



- (b) Write down the job of part **Y**


- (c) These leaf cells also contain chloroplasts. What is the job of chloroplasts?

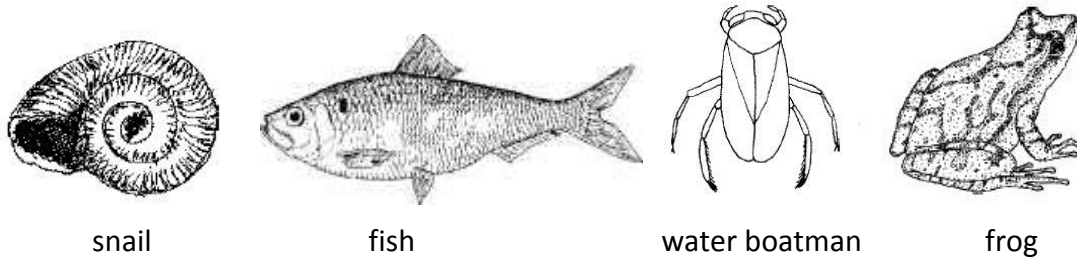

- (d) Label the parts of this slide that is being made.



- (e) Describe, in detail, how to make a **good** wet mount slide of onion cells, stained with iodine.


### Question Ten. [3 marks]

Sally investigates two different pond habitats, pond A and pond B. Sally collects some different animals from pond A. Look at the pictures. They show some of the animals she collects. (The pictures are NOT to scale).



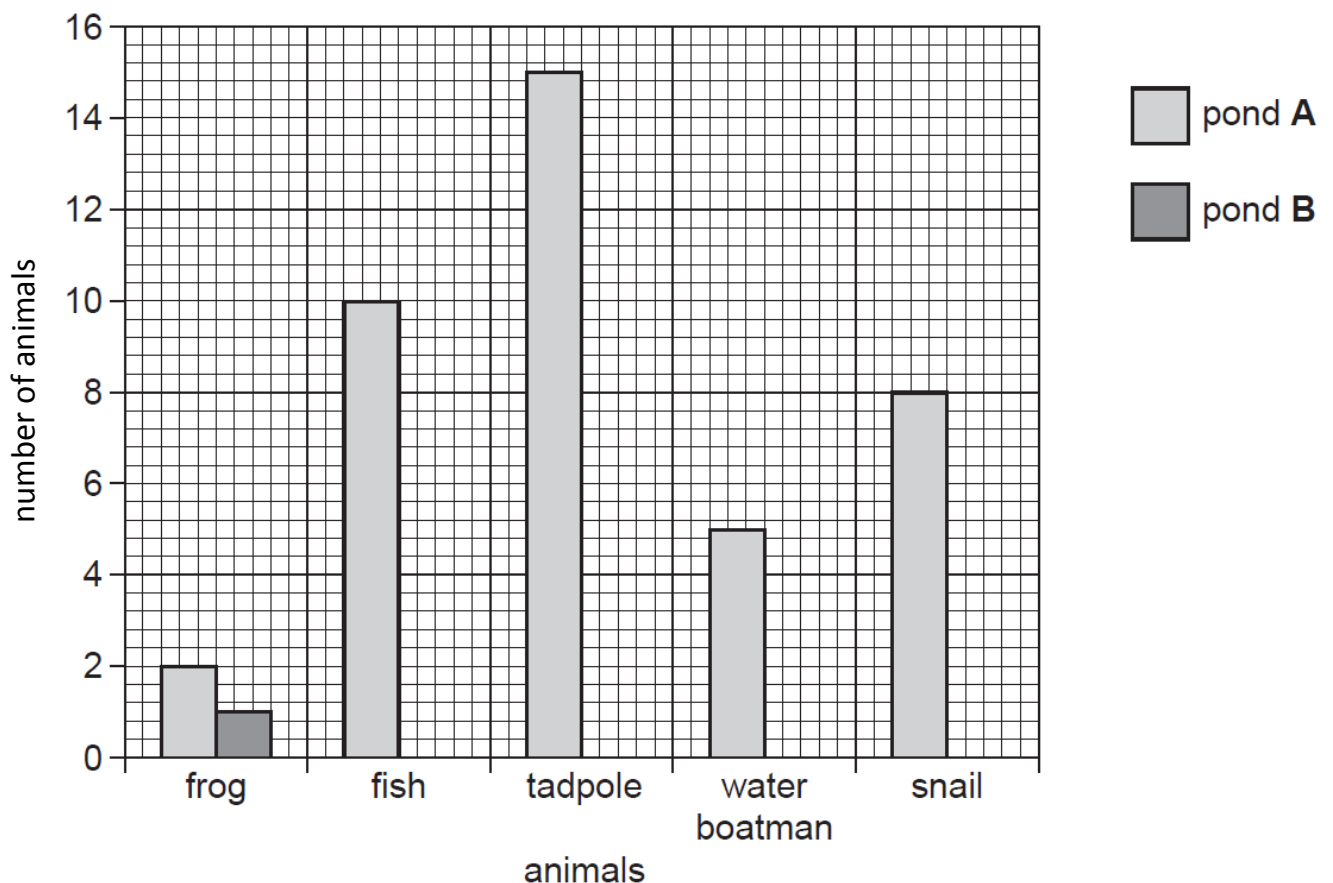
- (a) Write down the name of one amphibian Sally collects. Choose your answer from the pictures.

- (b) Sally records the numbers of the animals she finds. The table shows her results.

		animal				
		frog	fish	tadpole	water boatman	snail
number caught	pond A	2	10	15	5	8
	pond B	1	3	2	0	4

Sally puts her results for pond A onto a bar chart. Finish the bar chart for pond B. The first one has been done for you.

**Numbers of each type of animal found in pond A and pond B**



**Question Eleven. [6 marks]**

(a) Which word means the study of the atmosphere, monitoring and predicting weather and climate? **Circle your answer.**

(A) Oceanography

(C) Meteorology

(B) Hydrology

(D) Demography



(b) What word means the “average weather conditions” in a particular location? **Circle your answer.**

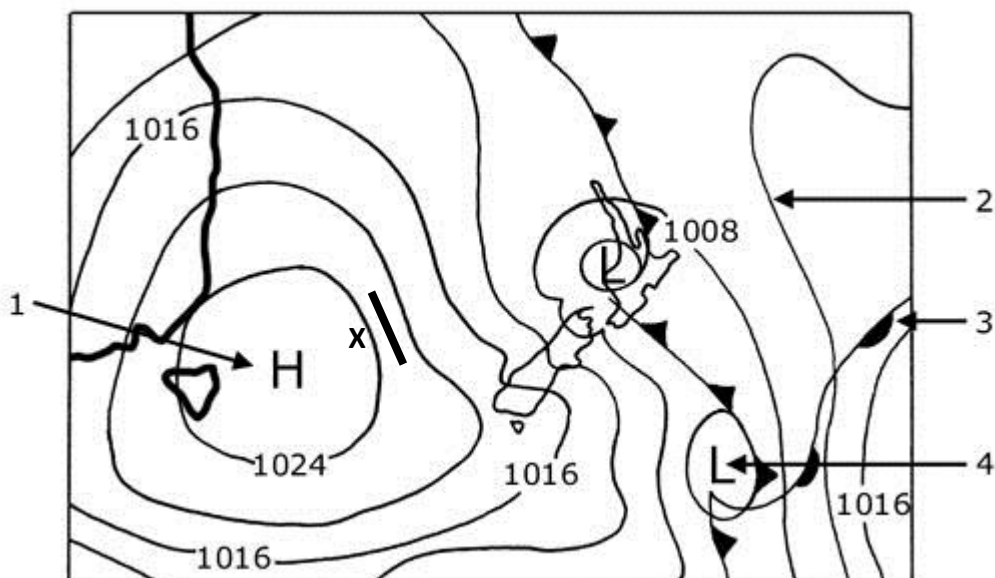
(A) weather

(C) ecosystem

(B) climate

(D) temperature

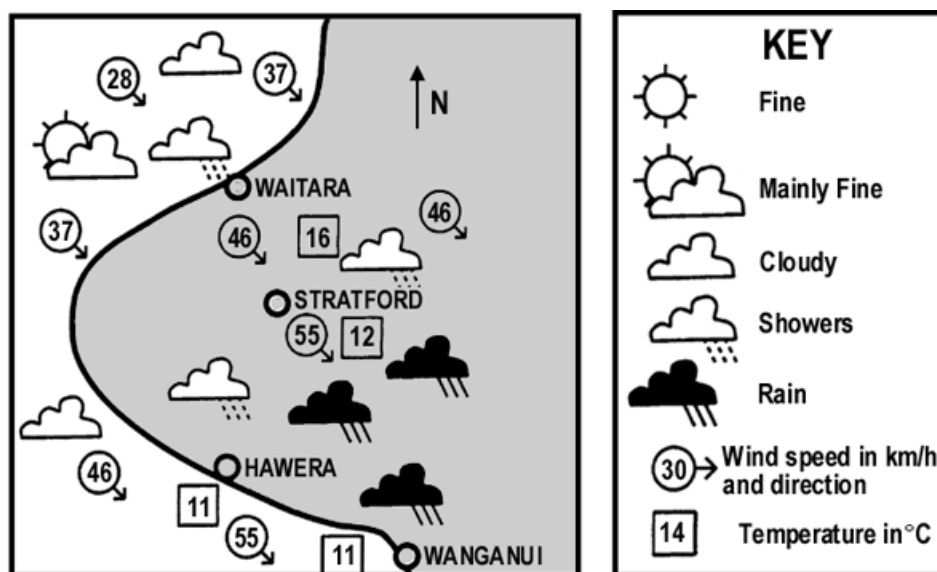
(c) Put an arrow head on the line  or  **on the map** to show the direction the wind would be blowing at **X**.



(d) **Name** the features 1 – 4 shown on the weather map.

Number	1	2	3	4
Feature				

- (e) The map below shows the weather for the Taranaki/Wanganui region for a day in November.



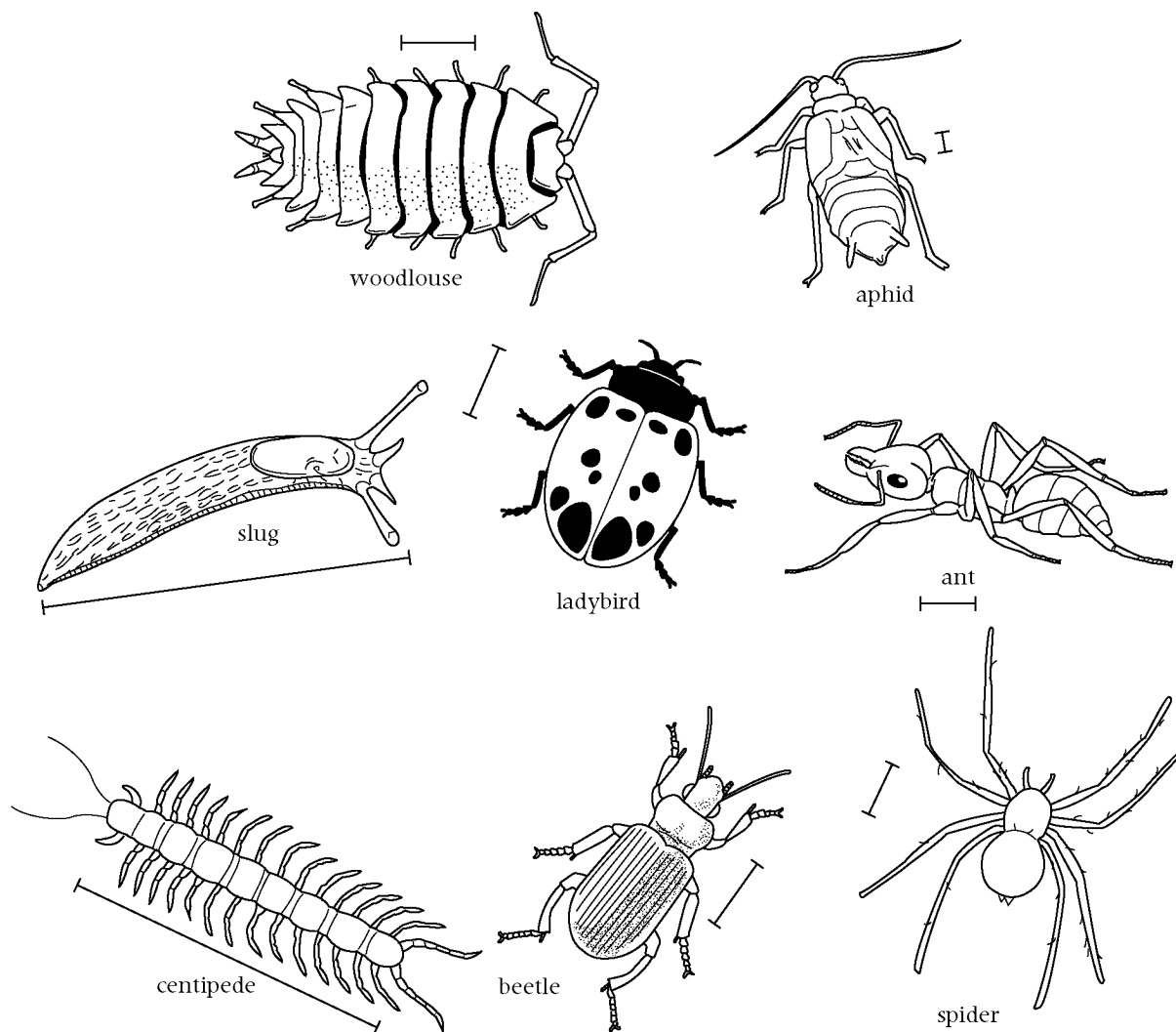
Describe the weather in Wanganui. Choose ONE from each line.

Will it;

(i) be raining <b>or</b> showery <b>or</b> rain clearing, <b>or</b> fine	
(ii) be cold <b>or</b> warm	
(iii) have light <b>or</b> strong winds	
(iv) have north-westerly <b>or</b> south-easterly winds	

**Question Twelve. [5 marks]**

Here are some pictures of some common invertebrates. The lines drawn beside them show how long the body of each invertebrate is in real life. The “body” doesn’t include the legs or feelers.



- (a) In real life which is bigger, the beetle or the ant?

- (b) Arrange these 6 animals in order of increasing size in real life.

aphid centipede ladybird slug spider woodlouse

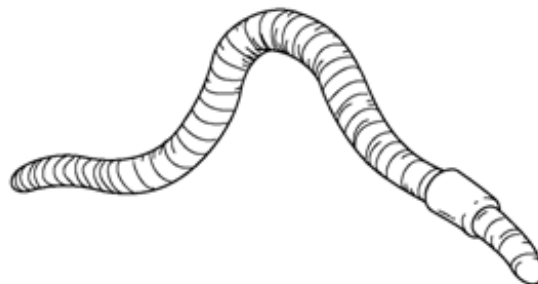
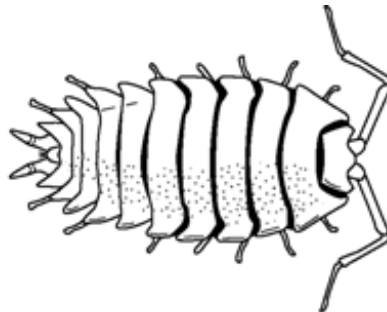
<i>smallest</i>							<i>largest</i>
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(c) Choose **ONE** of these invertebrates – snail, woodlouse, worm.

(i) Tick its scientific name from the list below

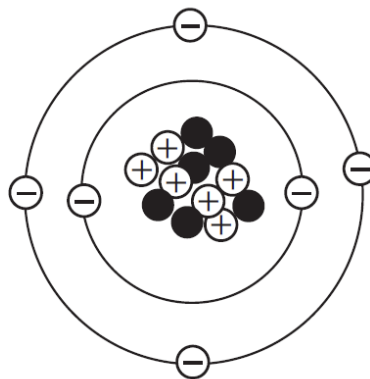
☐ *Lumbricus terrestris*      ☐ *Porcellio scaber*      ☐ *Helix aspersa*

(ii) Label 4 parts of the body of the one animal you chose above.



**Question Thirteen. [4 marks]**

The diagram shows the structure of an atom.



- (a) Protons and neutrons are in the centre of the atom. What is the name for this part of the atom?

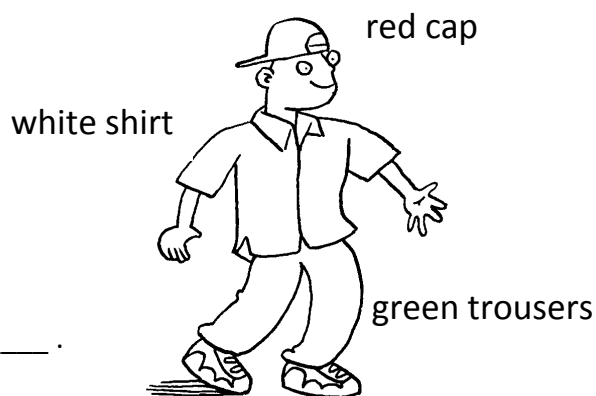
- (b) What is the name of the particle with the negative charge?

- (c) What is the **atomic** number of this atom?

- (d) What is the **mass** number of this atom?

**Question Fourteen. [3 marks]**

This is Joe, ready to go out to the disco!



- (a) What colour will his clothes appear in a green disco light?

- (i) His red cap will look \_\_\_\_\_.
- (ii) His green trousers will look \_\_\_\_\_.

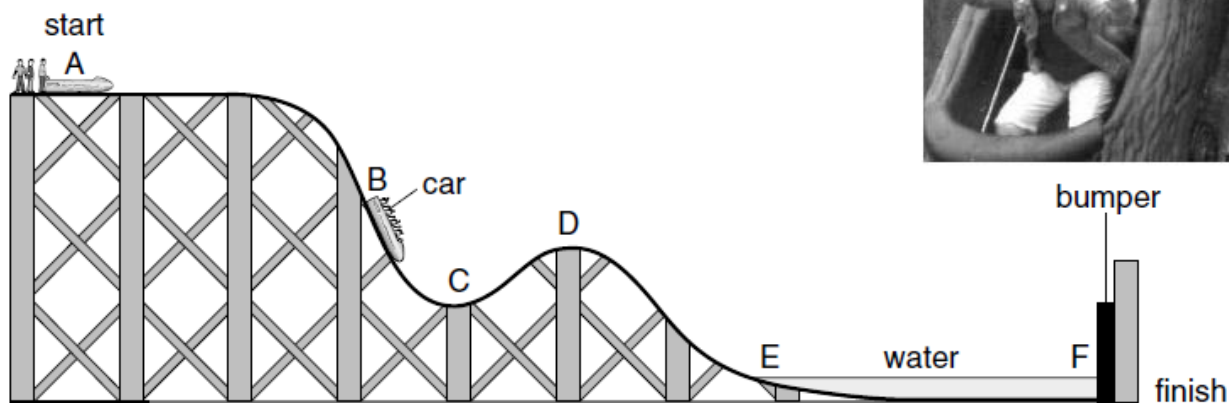
- (b) Explain why his cap will look the colour you have described?


**Question Fifteen. [5 marks]**

The photograph shows some pupils in a log car on a theme-park ride. the ride.



The letters A, B, C, D, E and F show different points along the track.



The car starts from A and travels to F, where it stops by hitting a bumper. At E the car enters a trench filled with water.

- (a) At which **two** points does the car have **no** kinetic energy? Give the **two** correct letters.

- (b) At which point does the car have the **most** gravitational potential energy? Give the correct letter.

- (c) At which point does the car have **some** kinetic energy and the **least** gravitational potential energy? Give the correct letter.

- (d) Complete the sentence below by choosing from the following words.

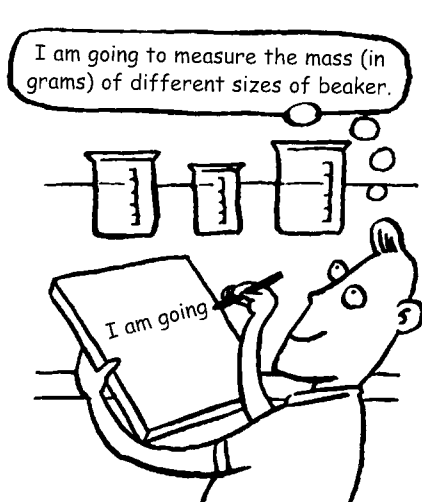
**chemical    gravitational potential    kinetic    light    sound    heat**

When the car hits the bumper at **F**, its \_\_\_\_\_ energy is transferred into  
\_\_\_\_\_ energy and \_\_\_\_\_ energy.



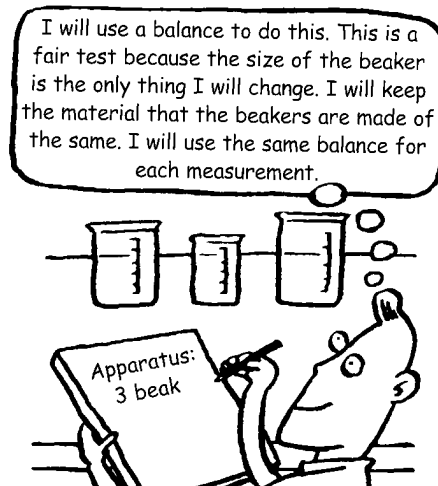
### Question Sixteen. [7 marks]

John and Jane did an experiment involving beakers. Read the “cartoons” and the text below each.



Write down what you are going to investigate.

Write down what you will do, what you will measure and what equipment you will use.

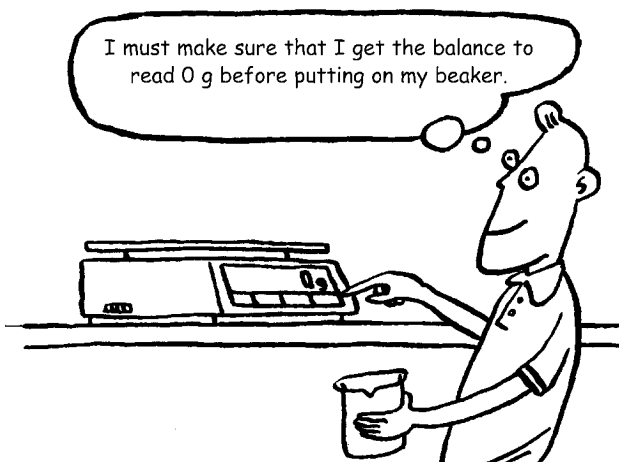


Your investigation should be a **fair test**. This means that you should only change one thing at a time and keep all the other things the same.

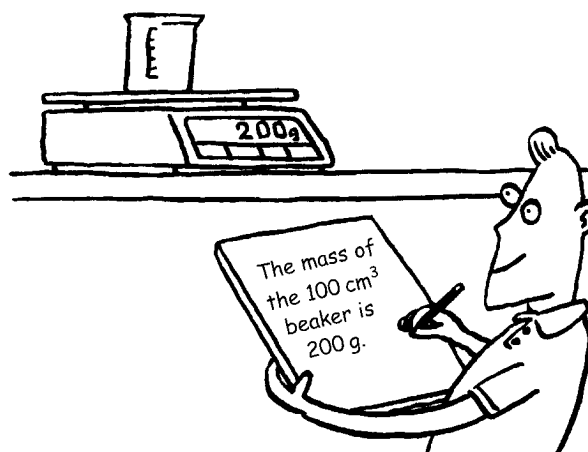
The things that you can change are called **variables**. Write down what you will change and what you will keep the same.

(a) What is a **variable**?

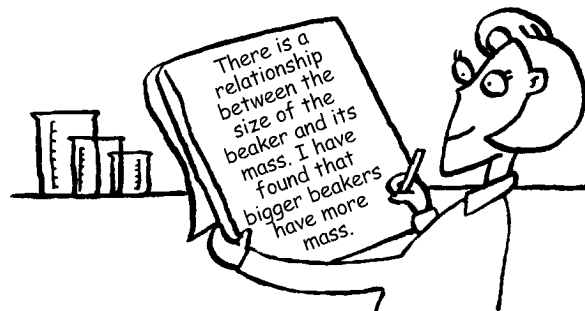
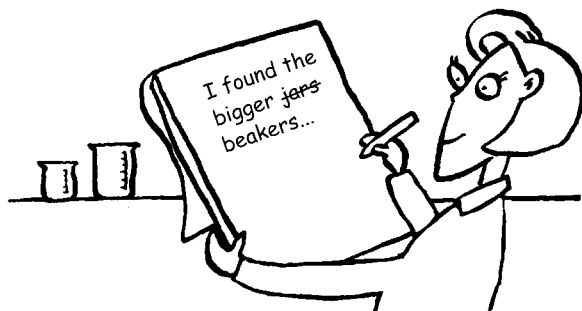

(b) What is a **fair test**?

Make sure you use all the equipment carefully.



Write down all your results neatly. Do not forget to write down the units that you are measuring in. Write down any other observations carefully.



Make sure you use scientific words when you write down what you have found out.

Write down any patterns you can find in your results. Simple patterns between things are called **relationships**.



*Evaluation - How you could make your investigation better and why this would make it better.*

In the investigation in the pictures on this page:

- (c) What **ONE** variable has the student changed?


- (d) Which variables has the student kept the same?


- (e) What equipment did the student use to measure the mass?

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- (f) What **units** was the mass measured in?

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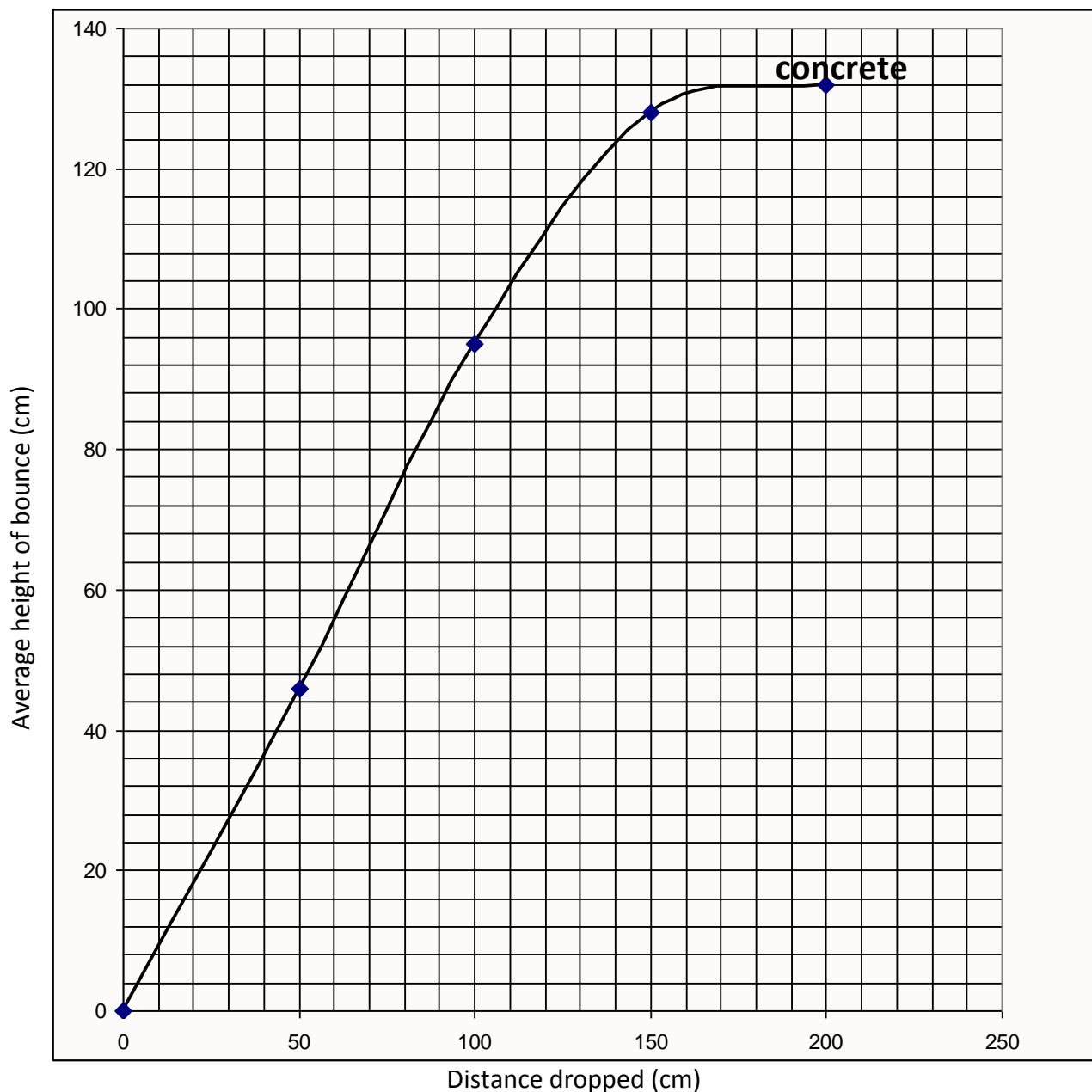
- (g) What is the **relationship** the student found?


**Question Seventeen. [9 marks]**

Susi and George decided to investigate how the height to which a ball bounces varies with different surfaces. They dropped a tennis ball from different heights onto a concrete floor and a wooden floor. They produced a table and graph of their results.

Distance ball dropped (cm)	Average height of bounce of ball on concrete floor (cm)	Average height of bounce of ball on wooden floor (cm)
50	46	34
100	Y	66
150	128	94
200	132	100

**Graph to show how average bounce height varies with different surfaces**



- (a) **Plot the results** for dropping the ball onto the wooden floor, on the same graph.
- (b) What is one piece of equipment that Susi and George could have used to take their measurements?

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- (c) Identify **TWO** variables (things) that would need to have been kept constant when carrying out this experiment.

1.
2.

- (d) One piece of data is not shown in the table. It is marked Y. Use the graph to work out the value of Y.

Y =
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- (e) What evidence is there that Susi and George dropped the ball from each height more than once?


- (f) The tennis ball was now dropped from a height of 250 cm onto the concrete floor. Using the graph, discuss how high in centimetres you would expect it to bounce.


- (g) What are **TWO** conclusions Susi and George could make from their results?

1.
2.