

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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SCIENCE

Paper 2

1113/02

October 2016

45 minutes

Candidates answer on the Question Paper.

Additional Materials:

Pen
Pencil
Ruler

Calculator

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

You should show all your working in the booklet.

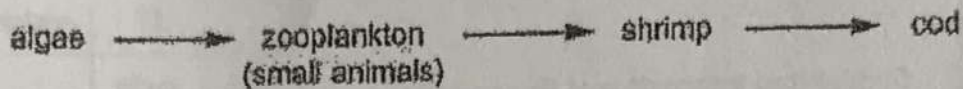
At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.

This document consists of 14 printed pages and 2 blank pages.

1 Here is a food chain from the Atlantic Ocean.



(a) How many trophic levels are there in this food chain?

[1]

(b) Explain why algae are called producers.

[1]

(c) Humans have overfished the cod, causing their numbers to decrease.

What effect will this have on the numbers of the shrimp?

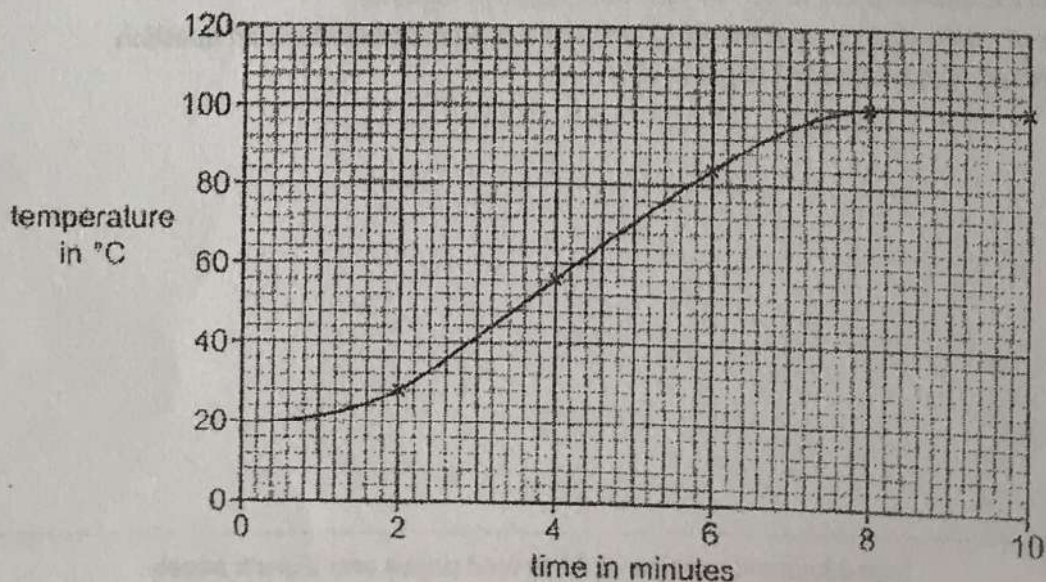
Explain why.

[2]

2 Gabriella investigates change of state.

- She puts water into a beaker and heats it gently.
- Every 2 minutes Gabriella records the temperature.

The graph shows her results.



(a) How many minutes does it take for the temperature of the water to reach 100°C?

..... minutes [1]

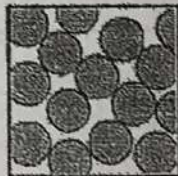
(b) Complete the sentences to explain what is happening to the water particles between 8 and 10 minutes.

The water particles gain more energy.

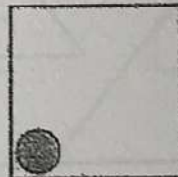
The particles move

This causes the particles to out. [3]

(c) The diagram shows the particles in liquid water.



Complete this diagram to show the particles in solid ice.



[2]

3 Chen draws a diagram showing dispersion of light.

(a) He has not labelled the diagram.

Label the diagram using the following words.

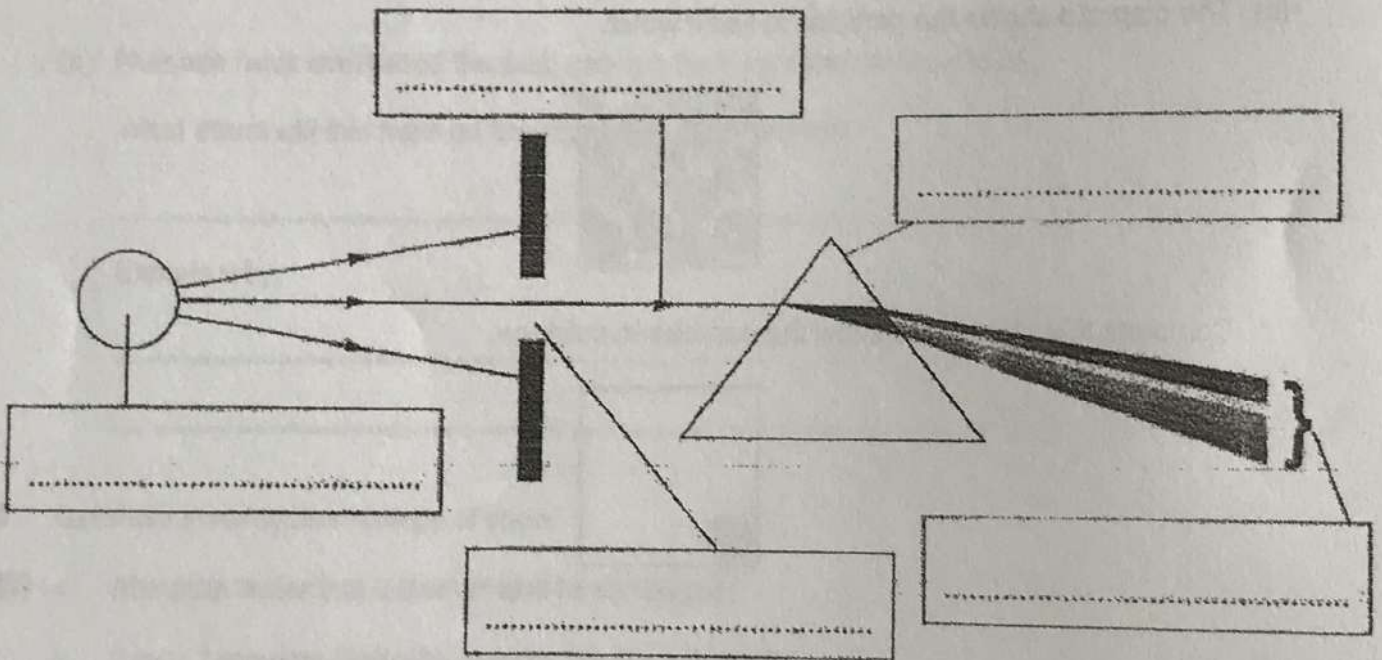
light ray

light source

slit

prism

spectrum



[2]

(b) The light from the light source is dispersed into the full colour spectrum.

What colour is the light from the light source?

Circle the correct answer.

blue

green

red

white

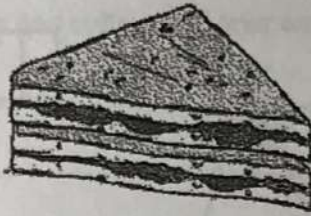
yellow

[1]

(c) Draw the letter X on the diagram to show where dispersion happens.

[1]

- 4 The diagram shows a sandwich.



The sandwich consists of layers of meat, lettuce and butter placed between slices of bread.

- (a) Draw a line from each food item in the sandwich to the main type of nutrient it contains.

food item	main type of nutrient
meat	carbohydrate
bread	fat
lettuce	protein
butter	roughage (fibre)

[2]

- (b) The sandwich provides many of the ingredients of a balanced diet.

What is meant by the term **balanced diet**?

.....

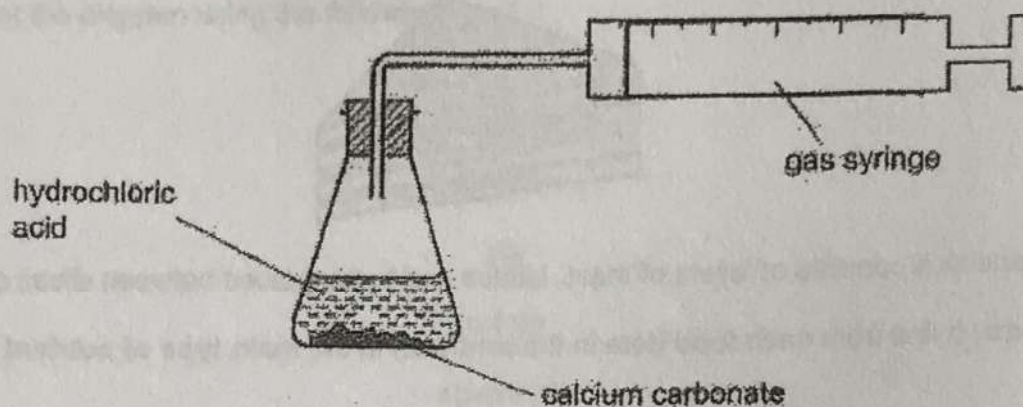
.....

.....

[2]

- 5 Angelique and Pierre investigate the rate of reaction between hydrochloric acid and calcium carbonate.

The diagram shows the apparatus they use.



- They add 1 g of calcium carbonate to 25 cm³ of hydrochloric acid.
- They measure the volume of gas collected in 2 minutes.
- They then repeat the method using different concentrations of acid.

The table shows their results.

relative concentration of acid	volume of gas collected in cm ³
1	6.2
2	11.8
3	19.3
4	27.1
5	32.7

(a) As the concentration of the acid increases the rate of reaction increases.

(i) Explain how the results show this?

.....

.....

[1]

- (ii) Explain why the rate of reaction increases as the concentration of acid increases.

Use ideas about particles and collisions in your answer.

.....

.....

.....

[2]

- (b) Angelique tells Pierre that the results are not reliable.

How could they make the results more reliable?

.....

[1]

- 6 Oliver keeps some drinks in a refrigerator.

He measures the time it takes the drinks to warm up to room temperature.

He wants to find out how the volume of a drink affects this time.

He thinks the following variables are important in his investigation.

A – temperature of the cold drink in the refrigerator
B – room temperature
C – volume of drink
D – type of drink
E – time taken for cold drink to warm up to room temperature

Write down the letters of the variables to answer each question.

- (a) Which variable will Oliver change?

[1]

- (b) Which two variables must Oliver measure? and

[2]

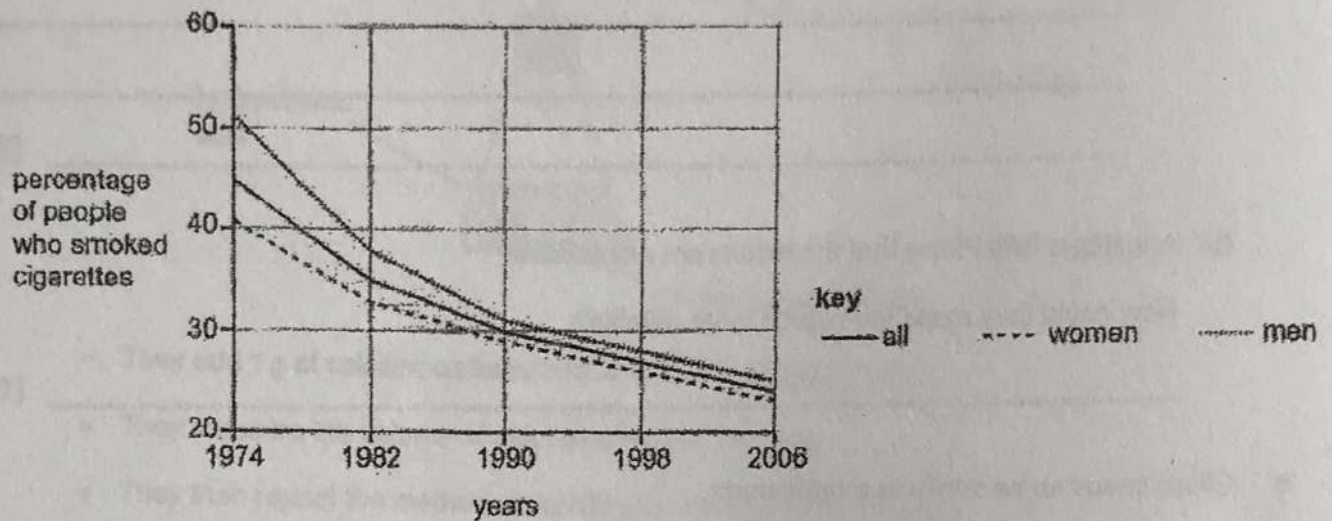
- (c) Which three variables should Oliver keep the same?

..... and and

[1]

- 7 Scientists have found evidence which shows that smoking tobacco increases the risk of developing serious diseases.

(a) The graph shows the percentage of people who smoked cigarettes between 1974 and 2006.



Describe two patterns shown by the data.

1

2

[2]

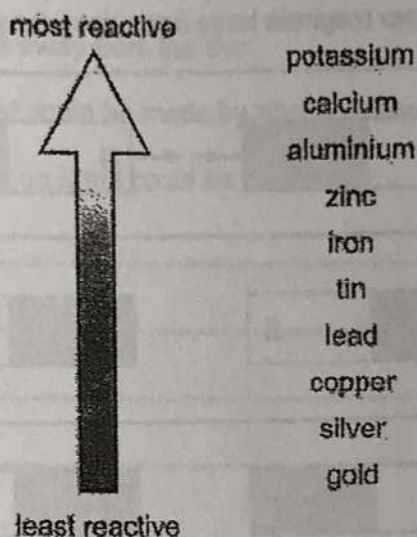
(b) Smoking cigarettes increases the risk of getting lung cancer.

Doctors predict that there will be fewer cases of lung cancer in the future.

Use information from the graph in part (a) to suggest a reason for this prediction.

[1]

- 8 Look at the diagram of a reactivity series.



Use the diagram and your scientific knowledge to answer these questions.

- (a) Some of the metals will displace other metals from their compounds.

Tick (✓) the boxes next to two displacement reactions that happen.

aluminium and copper chloride

copper and potassium chloride

gold and silver nitrate

lead and copper chloride

tin and zinc chloride

[2]

- (b) (i) Which gas is produced when a metal reacts with acid?

..... [1]

- (ii) Heat is released when a metal reacts with acid.

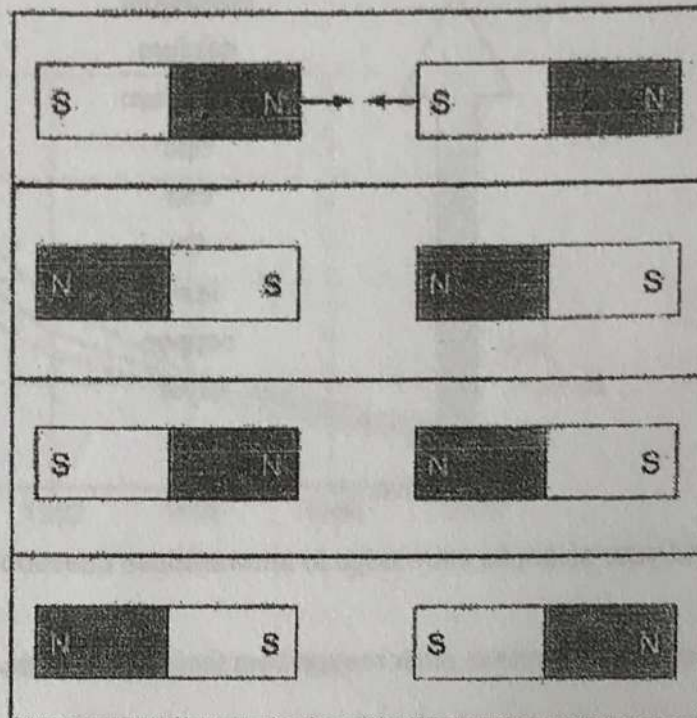
What name describes a reaction that releases heat energy?

..... [1]

9 Magnets have a North pole (N) and a South pole (S).

(a) Draw one arrow (\longrightarrow) on each magnet to show the direction of the force.

The arrows for the top two magnets have been done for you.

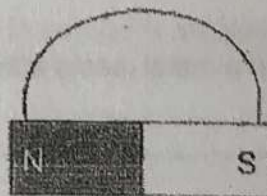


[2]

(b) There are magnetic field patterns around a bar magnet.

The diagram shows one magnetic field line.

(i) Draw an arrow on the field line to show the direction of the magnetic field.



[1]

(ii) Draw another two field lines with arrows on the diagram.

[1]

10 The Earth is about 150 million kilometres away from the Sun.

Mars is 227 million kilometres away from the Sun.

This will affect how much food could be made by photosynthesis on Mars.

Suggest why food production on Mars could be affected.

.....

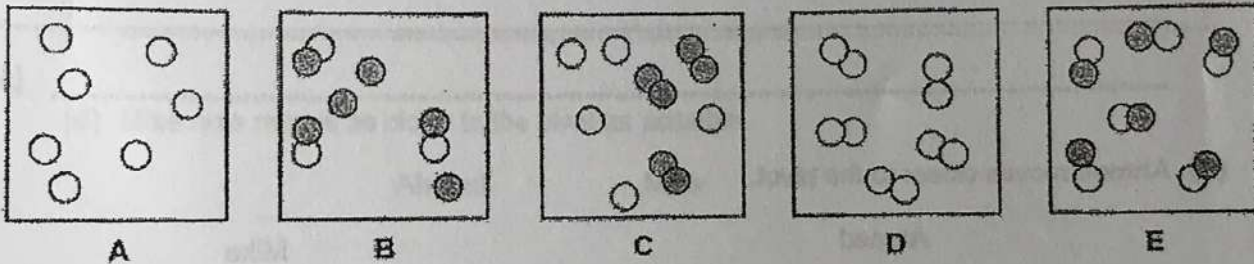
.....

Explain your answer

[2]

11 Look at the diagrams.

The white circles show one type of atom and the grey circles show another type of atom.



Which diagram A, B, C, D or E, shows

(a) a mixture of two elements?

[1]

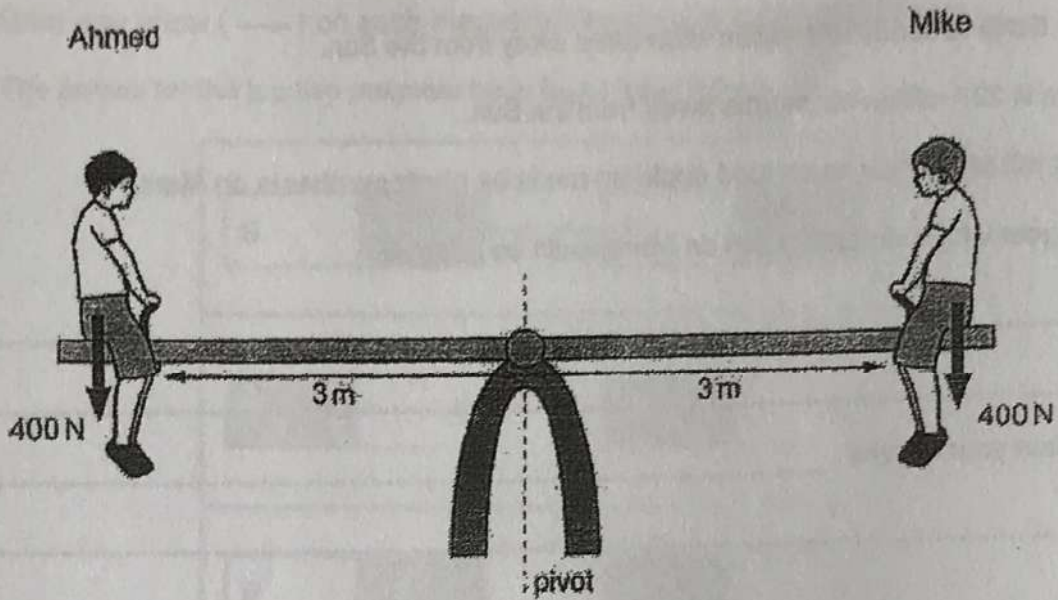
(b) a pure compound?

[1]

(c) one element made up of molecules?

[1]

12 Ahmed and Mike sit at opposite ends of a see-saw.



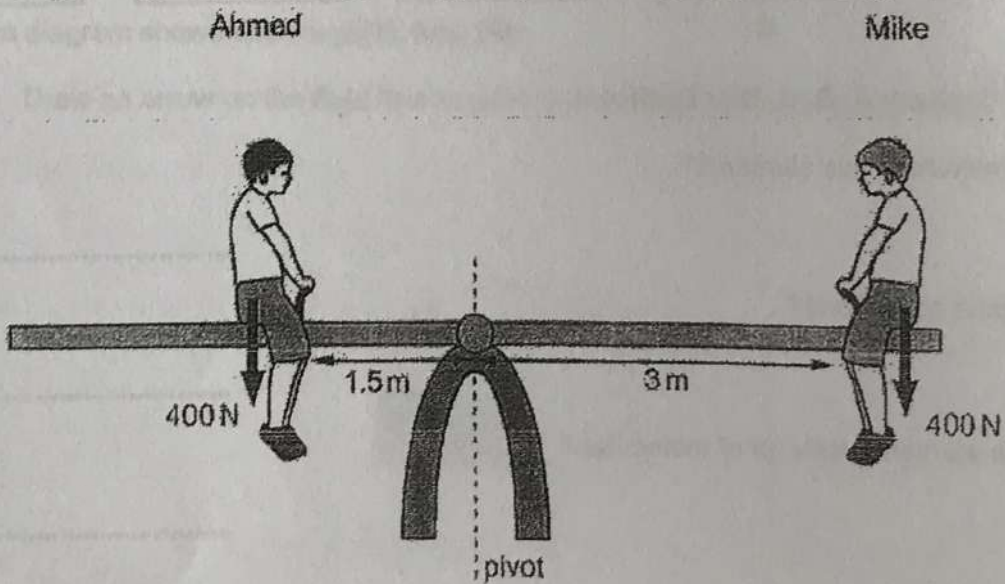
(a) The see-saw is balanced.

Explain why.

.....

..... [1]

(b) Ahmed moves closer to the pivot.

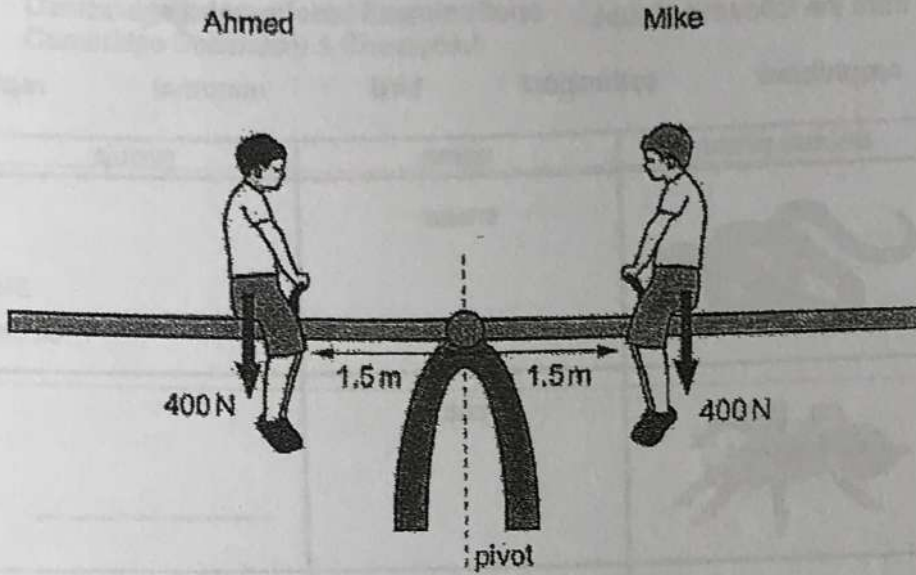


Describe what happens to the see-saw.

.....

..... [1]

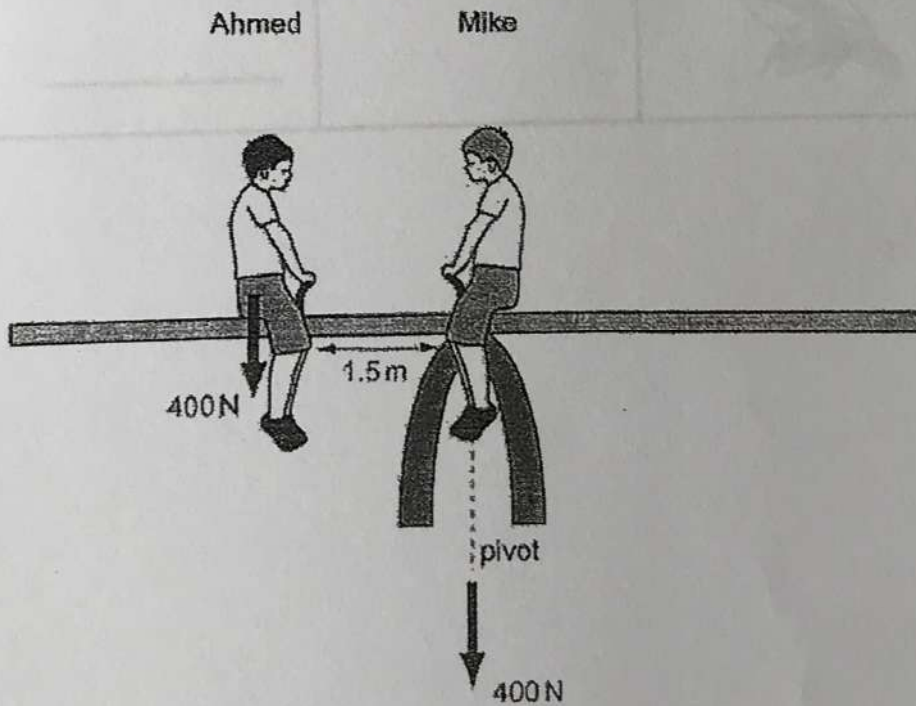
(c) Mike also moves closer to the pivot.



Describe what happens to the see-saw.

[1]

(d) Mike now moves as close to the pivot as possible.



Describe what happens to the see-saw.

[1]

13 Animals can be classified into different groups.

Complete the table.

Choose from the following groups.



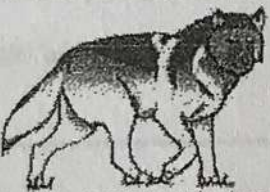

amphibian

arthropod

bird

mammal

reptile

	animal picture	name	group	
(a)		snake		[1]
(b)		tarantula		[1]
(c)		wolf		[1]
(d)		frog		[1]