BOARD OF STUDIES
NEW SOUTH WALES

2001
SCHOOL CERTIFICATE TEST

SPECIMEN

SCIENCE

SECTION 2

Directions for Section 2

This section has FOUR parts

Part A	Questions	51–60	(10 marks)
Part B	Questions	61–62	(12 marks)
Part C	Questions	63–64	(16 marks)
Part D	Questions	65–66	(12 marks)

Complete your answers to Section 2 Part A in the boxes provided on the separate answer sheet.

Complete your answers to Section 2 Parts B–D on the lines provided on pages 33 to 42.

Write your Centre Number and Student Number at the top of pages 33, 37 and 41.

Instructions for answering questions in Section 2 Part A

- **Completing the boxes**

  Write firmly and clearly. Your answer must be written from left to right. Use block letters for words. Numbers must be used for numerical answers. Decimal points and negative signs must be clearly shown in separate boxes. Do NOT let any part of the letter or number touch the sides of the answer boxes.

Sample 2: $-7 \div 2 =$ | – | 3 | · | 5 | | |

Sample 3: How many days are in a week? | 7 | | days

Sample 4: What is the fifth month? | M | A | Y | | | |

If you think you have made a mistake, put a line through the incorrect answer and write the correct one above the box.

M A Y
~~J~~ ~~U~~ ~~N~~ ~~E~~ | | |

PART A
Total Marks (10)

Complete your answers to Questions 51–60 on the Section 2 Part A Answer Sheet.

Use the information to answer Questions 51 and 52.

Kim carried out the following steps as part of an experiment.

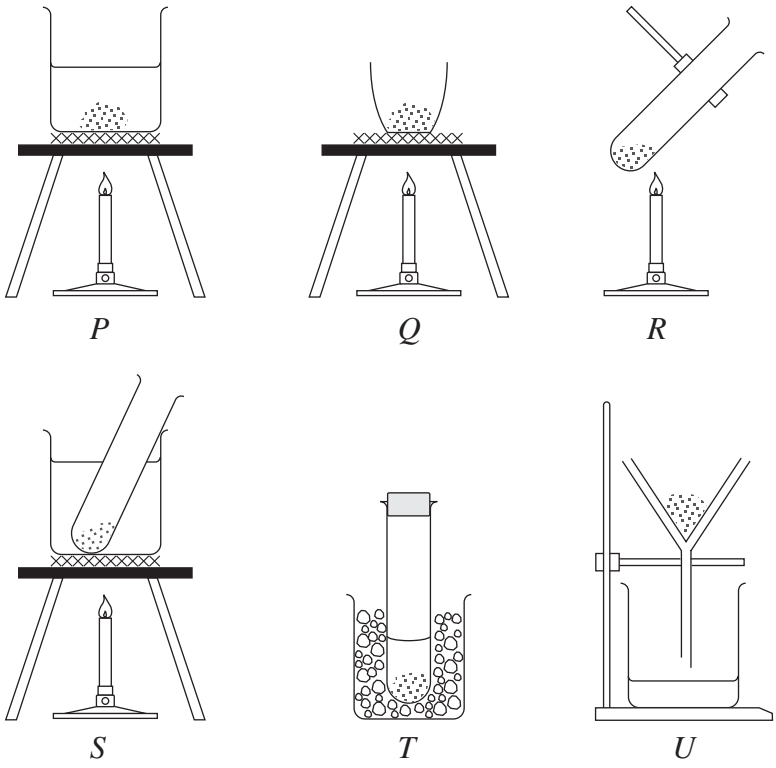
Step 1. Strongly heat the powder for ten minutes.

Step 2. Add the powder to water and heat the mixture until some of the powder dissolves.

Step 3. Separate the undissolved powder from the solution.

Step 4. Recrystallise the dissolved substance by cooling the solution in an ice bath.

The equipment that may be used for each step is shown.

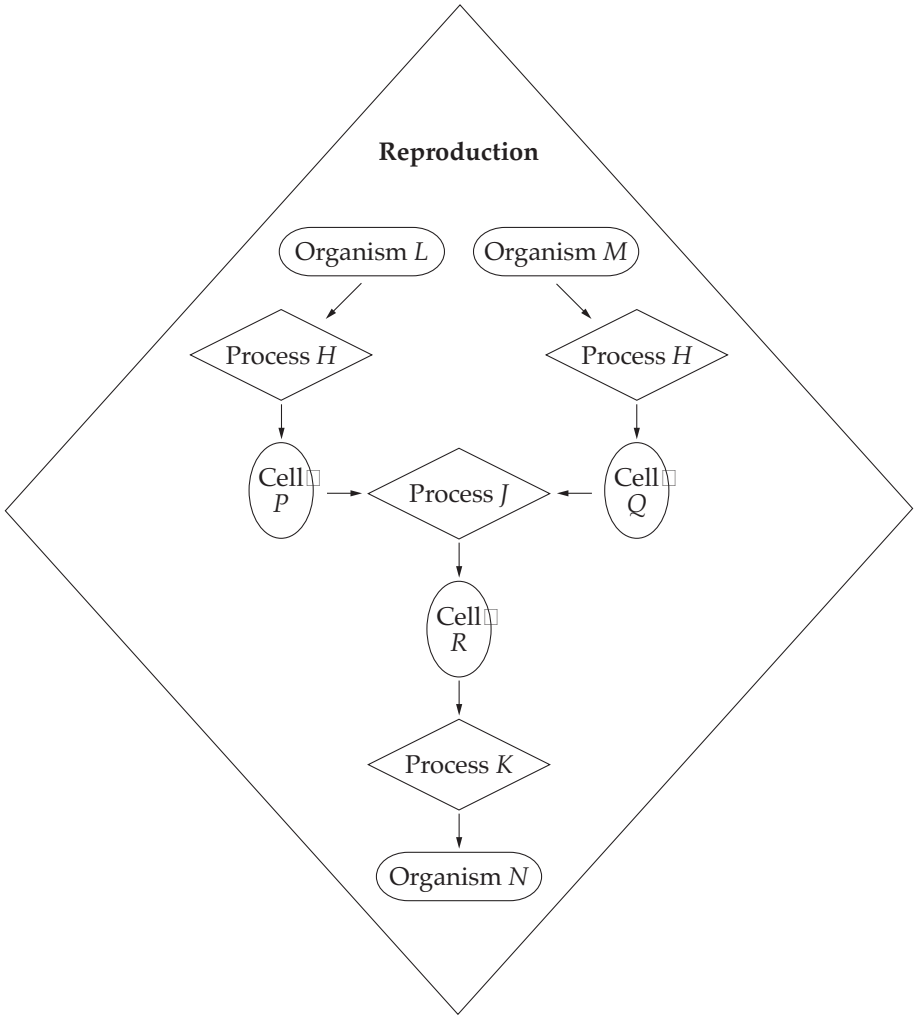


51 What is the correct sequence of equipment that Kim should use?

52 In which step could a stirring rod be used to speed up the process?

Use the flow diagram to answer Questions 53 and 54.

The flow diagram shows several processes occurring in most multicellular organisms.



53 Name ONE organ in which cell *P* may form.

54 Identify ONE process that represents cell division.

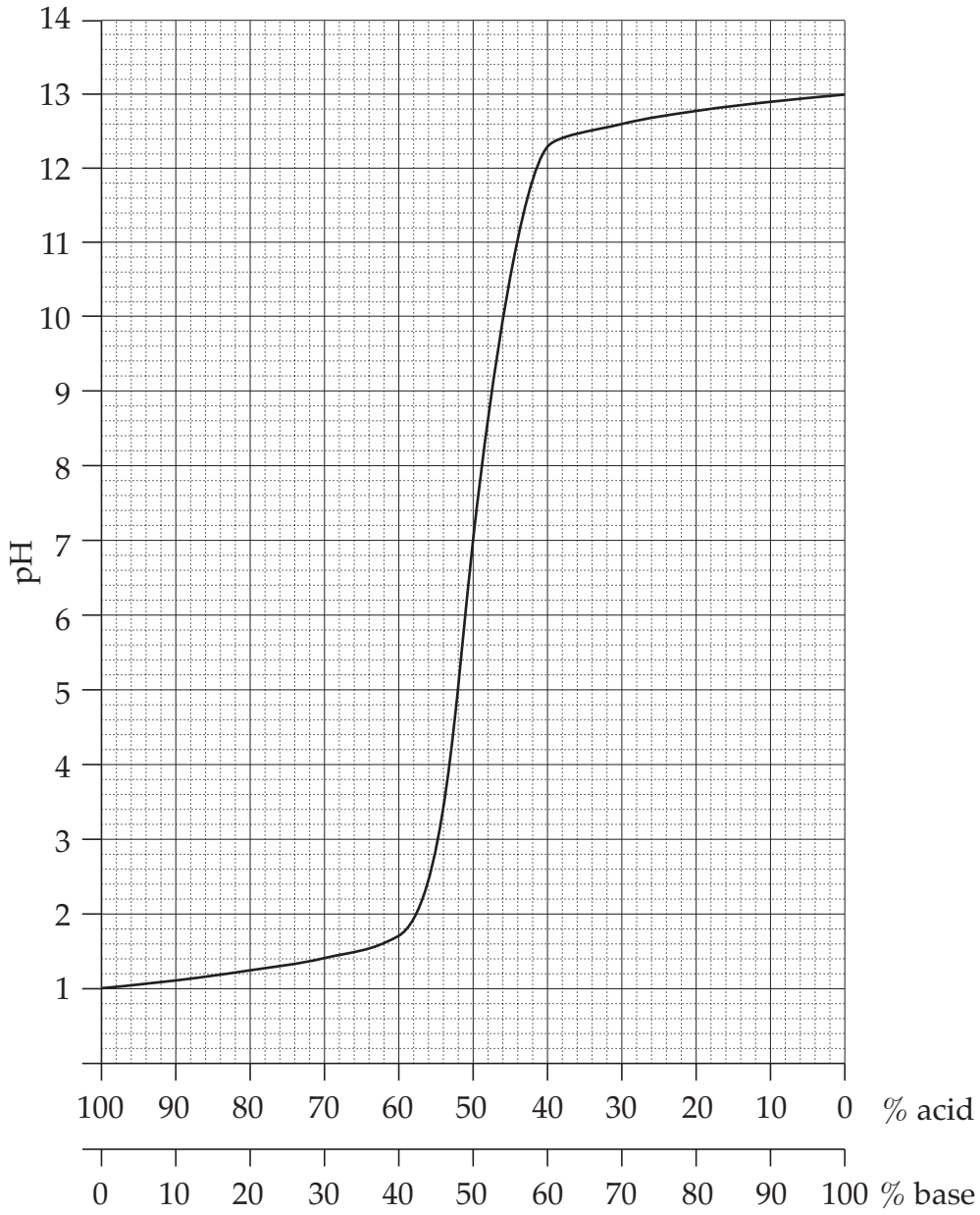
55 Name the chemical in chromosomes that allows information to be transferred.

56 What is the name given to the part of the Earth occupied by living things?

Use the information to answer Questions 57 and 58.

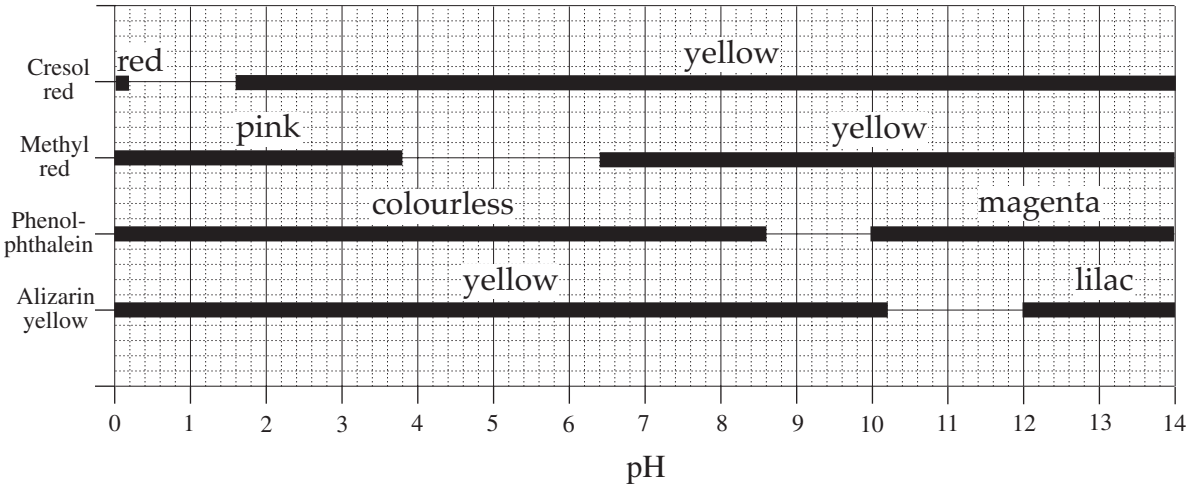
The pH of a mixture gives information about the percentage of acid and base present in a liquid.

The graph shows the pH when different amounts of acid and base are mixed.



57 What is the pH of a mixture made up of 90% acid and 10% base?

58 Some chemicals change colour at different pH. The diagram shows the colour of each chemical at different pH. **Marks**

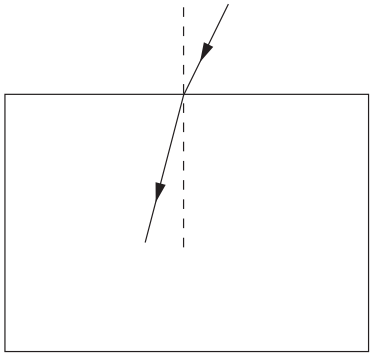


Some students prepared an acid–base mixture and tested four samples of it with different chemicals. They recorded the following results.

Sample No.	*Chemical*	*Final colour*
1	cresol red	yellow
2	methyl red	yellow
3	phenolphthalein	magenta
4	alizarin yellow	yellow

What is the percentage (%) of acid in this acid–base mixture?

59 The diagram shows a beam of light passing from air into a solid glass block.



Name the process shown.

60 Name ONE application of the effect shown in Question 59.

End of Section 2 Part A

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CENTRE NUMBER

STUDENT NUMBER

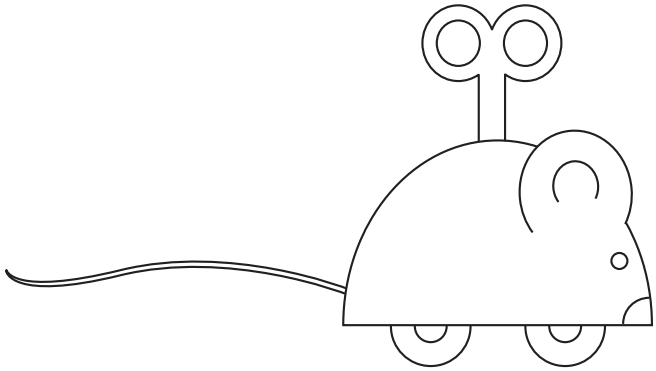
PART B

- Write your Centre Number and Student Number at the top of this page
- Complete your answers in this booklet

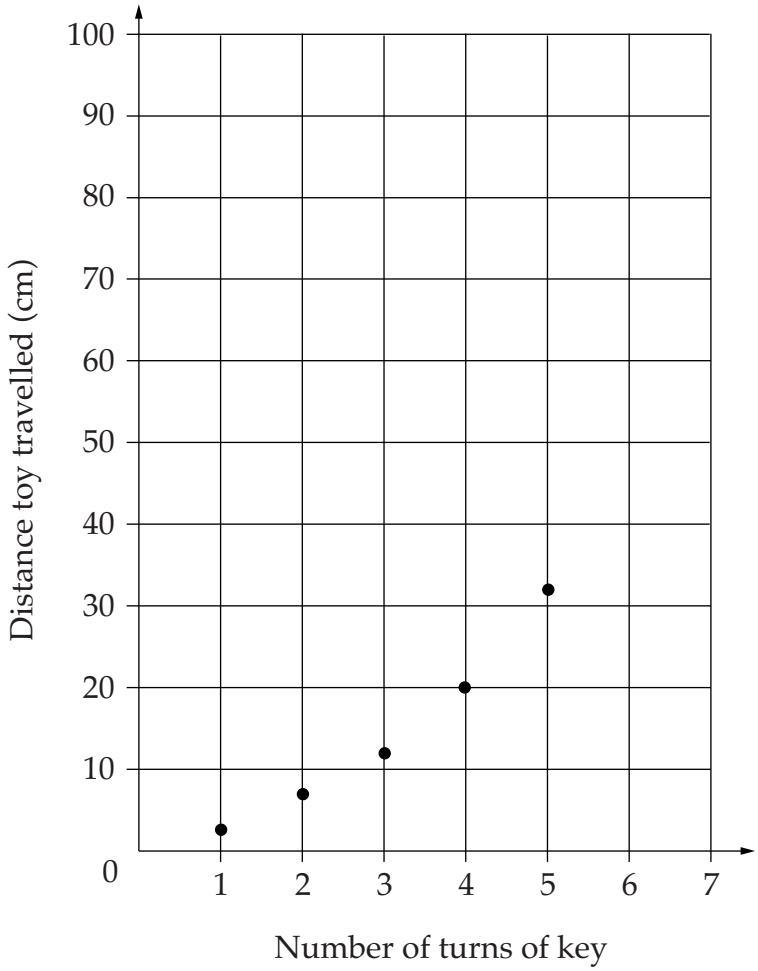
Part B continues on page 34

Question 61 (6 marks) **Marks**

Alec measured the distance a wind-up toy travelled when wound up by a different number of turns of the key.



The graph shows the results of this activity.



Question 61 (continued) **Marks**

(a) Predict how far the toy will travel if Alec winds the key seven times. **1**

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(b) Describe how the number of turns affects the distance the toy travels. **2**

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(c) Alec turned the key seven times. State TWO pieces of additional information that Alec would have to collect in order to determine the toy's average acceleration in the period from 2 to 4 seconds after it starts. Justify your answer. **3**

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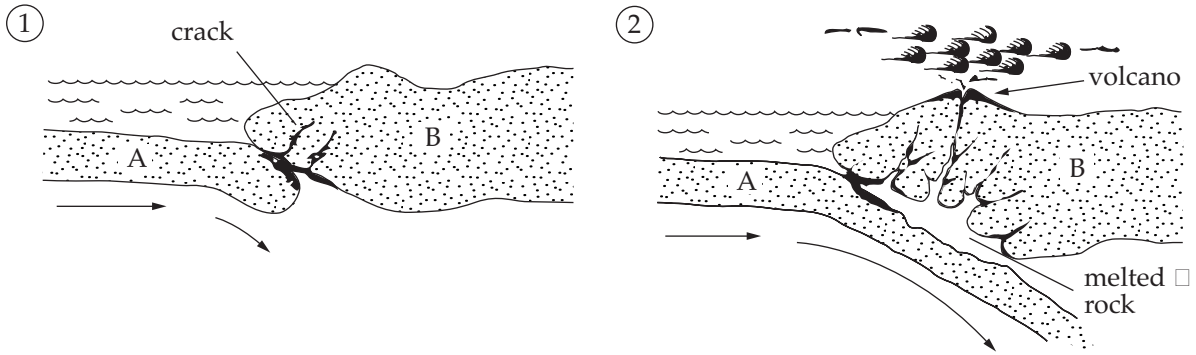
Part B continues on page 36

Question 62 (6 marks) **Marks**

The diagrams show the formation of a volcano. Use the diagrams to explain how this type of volcano forms. **6**



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End of Section 2 Part B

Go on to Part C

CENTRE NUMBER

STUDENT NUMBER

PART C

- Write your Centre Number and Student Number at the top of this page
- Complete your answers in this booklet

Part C continues on page 38

Question 63 (11 marks) **Marks**

Modern society uses more than 60 metals that are extracted from the earth and used. Each metal has its own properties which include strength, hardness, conduction of electricity and heat, resistance to corrosion, density and chemical activity.

Some metals are used more than others. This depends on the properties of the metal and how much it costs. The cost depends on how abundant the metal is and how easily we can mine and refine ore. The more chemically active a metal is, the faster it will corrode and the harder it is to extract from its ore.

The table shows data about some metals.

Metal	*Atomic symbol*	*World production* (thousands of tonnes per year)	*Density* ($g\ mL^{-1}$)	*Chemical activity*	*Estimated time known reserves will last* (years)
aluminium	Al	15 700	2.7	Most active	260
iron	Fe	750 000	7.9	↑	200
copper	Cu	12 000	8.9		40
silver	Ag	10	10.5		150
gold	Au	2	19.3	Least active	25

(a) Ignoring cost, and using the information provided,

(i) state a disadvantage of making cars out of gold; **1**

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(ii) explain an advantage of making cars out of gold. **2**

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Question 63 (continued) **Marks**

(b) Aluminium is the most abundant metal in the Earth's crust. Despite its abundance, aluminium is one of the more expensive to obtain. Using the information provided, explain a reason for this. **2**

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(c) Use the information given, or your knowledge, to answer the following question.

State a property of metals for which it is difficult to use substitute materials. Explain your answer. **3**

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(d) From your knowledge, use ONE example to describe the impact of technology on the use of metals. **3**

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Part C continues on page 40

Question 64 (5 marks) **Marks**

Some scientific data are shown:

- Kangaroos are harvested for food and leather.
- Kangaroo numbers have increased as people have provided more water from dams and bores, and killed dingoes that eat kangaroos.
- Harvesting of kangaroos can reduce their numbers.
- Kangaroo meat is very low in fat and free from harmful chemicals.

Using the information provided, justify TWO criteria that should be considered in the management of kangaroos as a resource. **5**

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End of Section 2 Part C

Go on to Part D

CENTRE NUMBER

STUDENT NUMBER

PART D

- Write your Centre Number and Student Number at the top of this page
- Complete your answers on this sheet

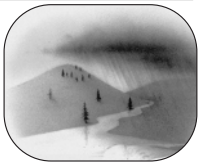
Marks

Question 65 (6 marks)

DRIVING YOUR CAR DAMAGES OUR FORESTS!

The combustion of fossil fuels, for example, oil or coal in power stations and petrol in cars, releases sulfur oxides and nitrogen oxides into the air. The sulfur and nitrogen oxides dissolve in water droplets in clouds, making the droplets acidic. These droplets fall as acid rain.

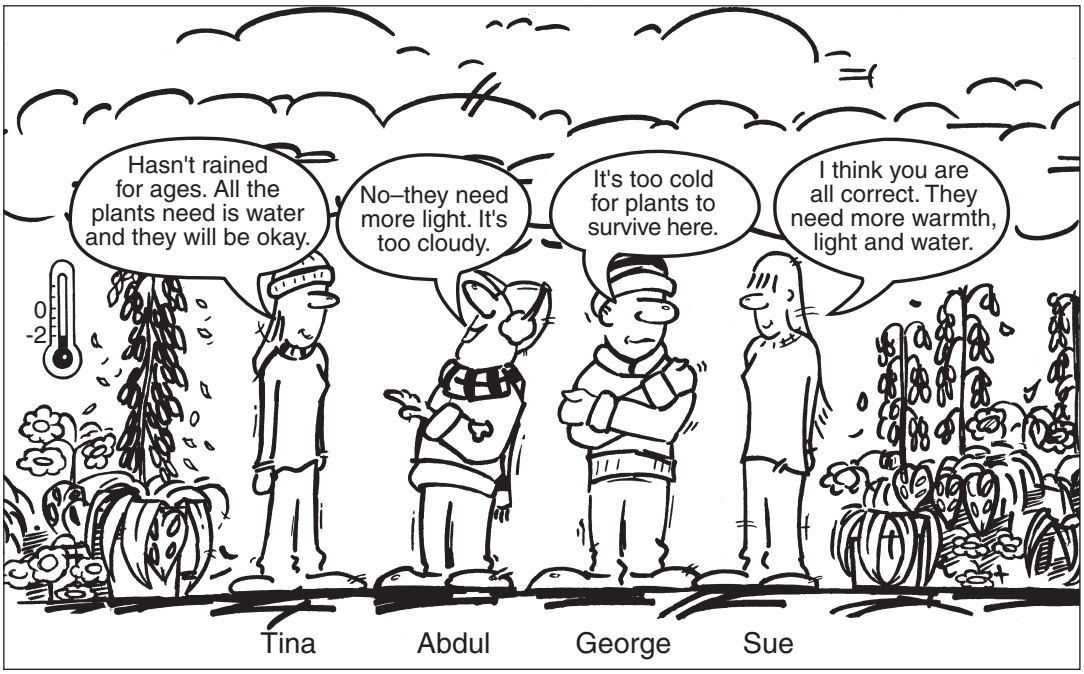
Plants may be damaged when acid rain falls on them. Acid rain soaking into the soil dissolves toxic chemicals which wash into streams, rivers and lakes. Fish and other organisms may be killed.



Draw a flow chart to show how acid rain forms from fossil fuels. Your flow chart must show what happens (processes) in diamonds (◇) and what is formed by each process (products) in rectangles (▭). **6**

Part D continues on page 42

Question 66 (6 marks) **Marks**



Design an investigation you could use to test Sue's idea. **6**

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End of test