



# Cambridge IGCSE™

## COMBINED SCIENCE

Paper 1 Multiple Choice (Core)

0653/11

May/June 2025

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)

### INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall =  $9.8 \text{ m/s}^2$ ).

### INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

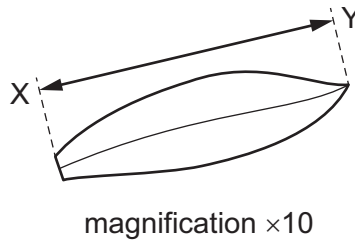
This document has **16** pages. Any blank pages are indicated.



1 What are characteristics of all living organisms?

- A excretion, breathing and sensitivity
- B gas exchange and muscle contraction
- C movement, excretion and respiration
- D muscle contraction and sensitivity

2 The diagram of a leaf is 40 mm long from X–Y.



What is the actual length of the leaf?

- A 0.25 mm
- B 2.5 mm
- C 4 mm
- D 400 mm

3 Which substance moves through a partially permeable membrane by osmosis?

- A amino acids
- B oxygen
- C sugar
- D water

4 Which small molecules join together to form large oil molecules?

- A amino acids and glucose
- B amino acids and glycerol
- C fatty acids and glucose
- D fatty acids and glycerol

5 Enzymes are .....Z..... that function as biological catalysts.

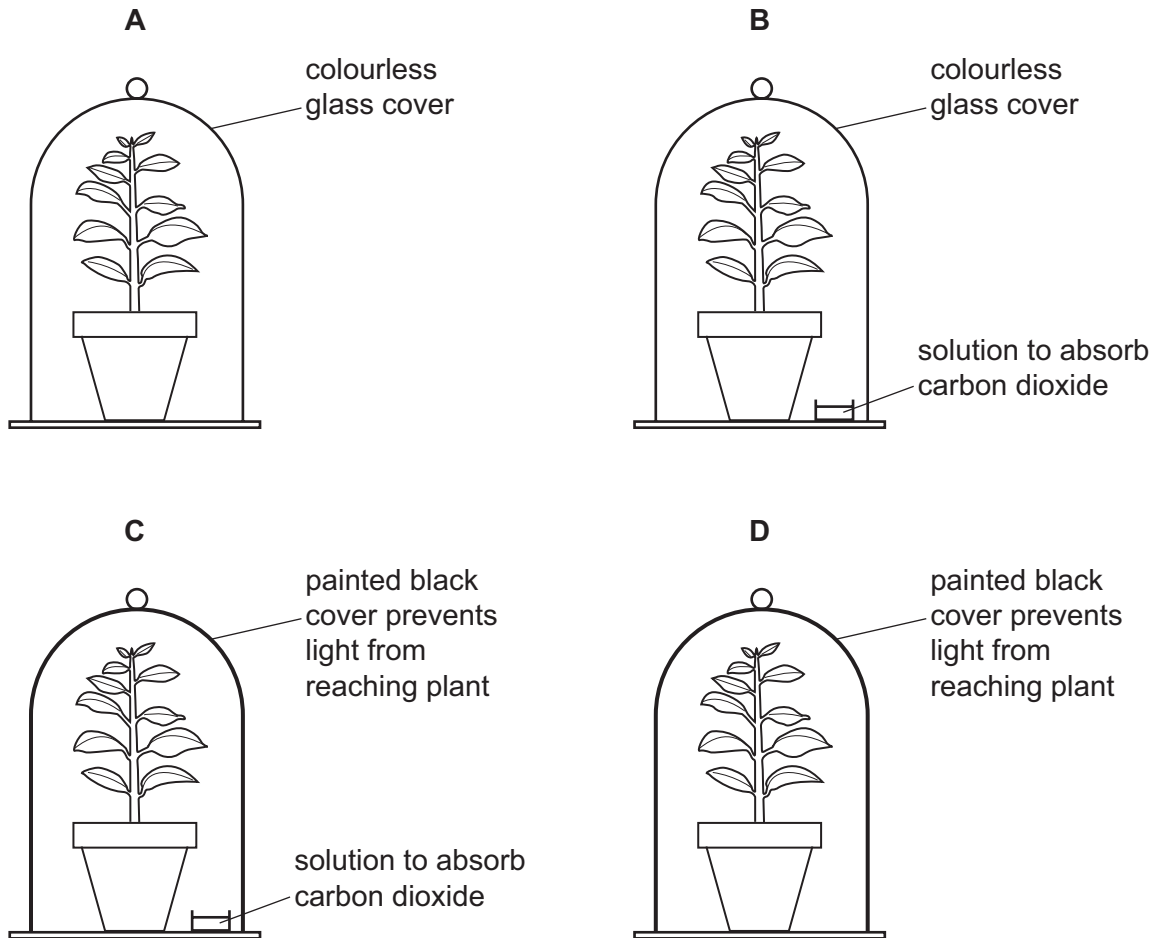
What is Z?

- A fats
- B proteins
- C sugars
- D vitamins

- 6 The diagrams show four identical, well-watered plants in different environments.

Each apparatus initially contains atmospheric air.

Which plant will produce the most oxygen?



- 7 Which part of a leaf of a dicotyledonous plant contains chloroplasts?

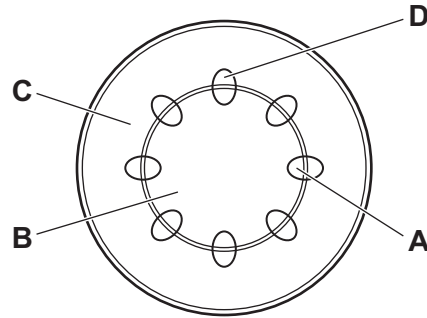
- A cuticle
- B palisade mesophyll
- C phloem
- D stomata

- 8 What is important for healthy teeth?

- A carbohydrates
- B fibre
- C iron
- D vitamin D

- 9 The diagram shows a cross-section of the stem of a dicotyledonous plant.

Which label shows the tissue responsible for the transport of water through the plant?



- 10 Aerobic respiration is described as the chemical reactions in cells that use .....1..... to break down .....2..... molecules to release .....3..... .

Which words complete the description?

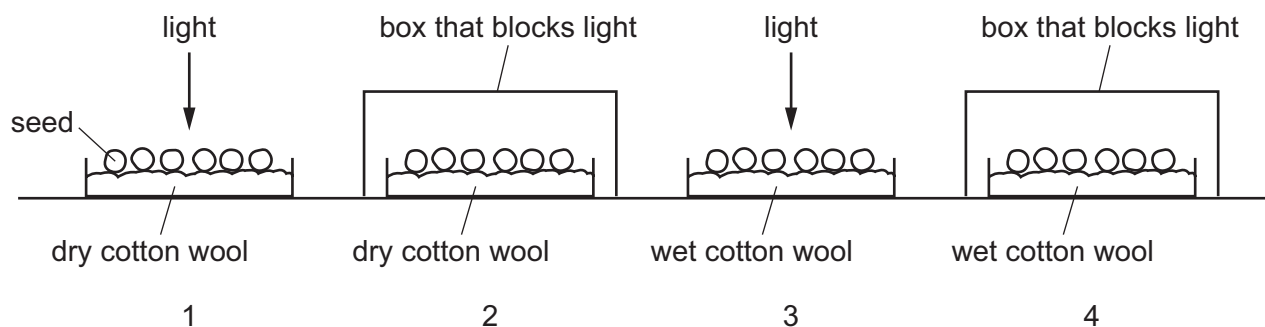
	1	2	3
<b>A</b>	energy	oxygen	carbon dioxide
<b>B</b>	oxygen	nutrient	energy
<b>C</b>	oxygen	carbon dioxide	nutrients
<b>D</b>	nutrients	oxygen	carbon dioxide

- 11 What is the function of the sepals in most insect-pollinated plants?

- A** to attract insects
- B** to make nectar
- C** to make pollen
- D** to protect flower buds

**12** The diagram shows dishes containing the same type of seeds in different conditions.

Each dish is placed in atmospheric air and at a temperature suitable for germination.



In which dishes will the seeds germinate?

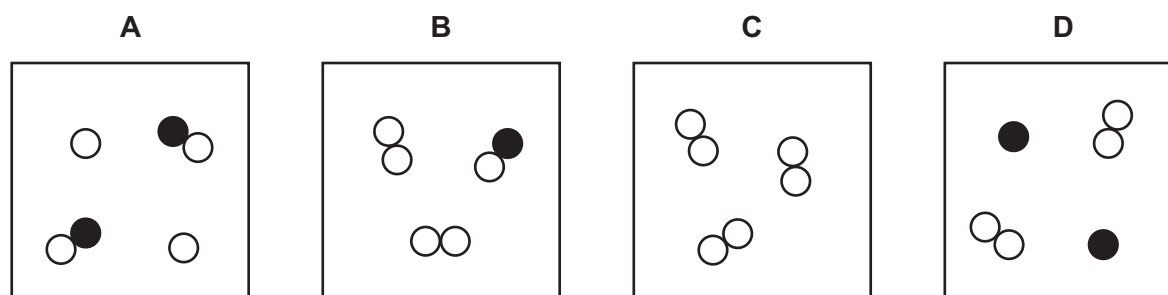
- A** 1 and 3      **B** 2 and 4      **C** 3 and 4      **D** 4 only

**13** What are undesirable effects of deforestation?

- 1 extinction of species
- 2 flooding
- 3 loss of soil
- 4 an increase of carbon dioxide in the atmosphere

- A** 1, 2, 3 and 4      **B** 1 and 4 only      **C** 2 and 3 only      **D** 2 and 4 only

**14** Which diagram represents a mixture of two different elements?

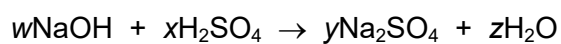


**15** Potassium and iodine react together to form potassium iodide, KI.

Which statement is correct?

- A** Ionic bonds form between neutral ions.  
**B** The potassium and iodine atoms share a pair of electrons to form a covalent bond.  
**C** The potassium and iodine atoms share a pair of electrons to form an ionic bond.  
**D** The potassium atom loses an electron to form a positive ion.

- 16 The unbalanced equation for the reaction between aqueous sodium hydroxide and dilute sulfuric acid is shown.

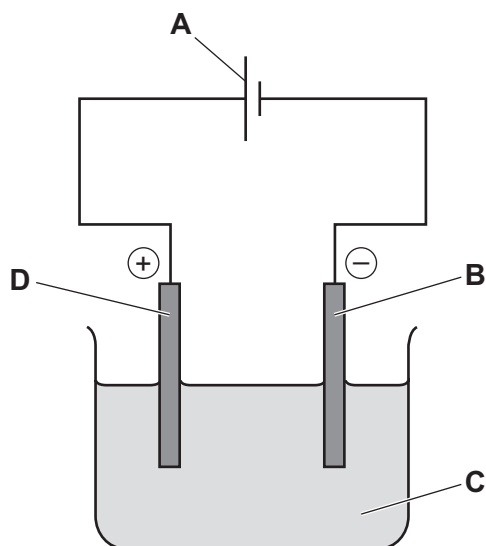


Which values of  $w$ ,  $x$ ,  $y$  and  $z$  balance the equation?

	$w$	$x$	$y$	$z$
<b>A</b>	2	1	1	2
<b>B</b>	2	1	2	1
<b>C</b>	1	1	1	1
<b>D</b>	1	2	1	1

- 17 The diagram shows electrolysis apparatus.

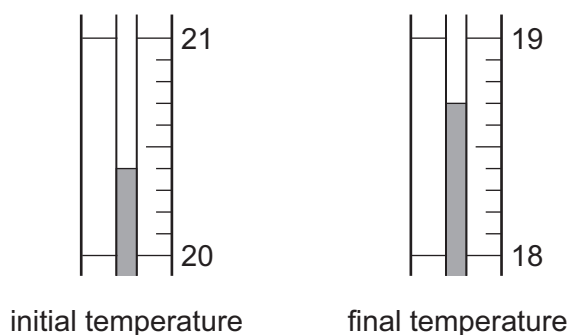
Which label shows the cathode?



- 18 The initial temperature of a sample of water is measured.

Ammonium nitrate is mixed with the water. The final temperature is measured.

The diagram shows the thermometer readings.



Which row shows the initial temperature, the final temperature and the type of reaction that occurs?

	initial temperature / °C	final temperature / °C	type of reaction
<b>A</b>	20.4	18.7	endothermic
<b>B</b>	20.4	18.7	exothermic
<b>C</b>	21.6	19.3	endothermic
<b>D</b>	21.6	19.3	exothermic

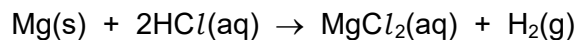
- 19 The evaporation of ethanol is an example of a .....1..... change because .....2..... .

Which words complete gaps 1 and 2?

	1	2
<b>A</b>	chemical	a gas is produced
<b>B</b>	chemical	no new compound is formed
<b>C</b>	physical	a gas is produced
<b>D</b>	physical	no new compound is formed

- 20** Magnesium is added to excess dilute hydrochloric acid.

The equation for the reaction is shown.



Which change in conditions increases the rate of this reaction?

- A** Use a larger volume of dilute hydrochloric acid.
  - B** Use larger pieces of the same mass of magnesium.
  - C** Warm the dilute hydrochloric acid before adding the magnesium.
  - D** Add water to the hydrochloric acid before adding the magnesium.
- 21** Which description explains why a reaction involves reduction?
- A** mass decreases
  - B** oxygen is lost
  - C** pH decreases
  - D** temperature decreases
- 22** Which number determines the order of elements in the Periodic Table?
- A** neutron number
  - B** nucleon number
  - C** proton number
  - D** relative atomic mass
- 23** Which statements about transition elements are correct?
- 1 They are in Group I of the Periodic Table.
  - 2 They form coloured compounds.
  - 3 They often act as catalysts.
  - 4 They have low melting points.
- A** 1 and 2      **B** 1 and 4      **C** 2 and 3      **D** 3 and 4



**24** Which statement explains why aluminium is extracted from its ore by electrolysis and **not** by heating with carbon?

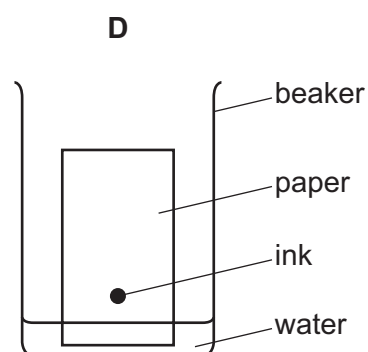
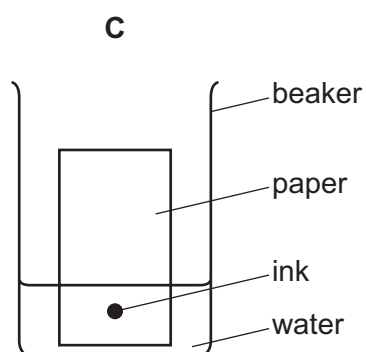
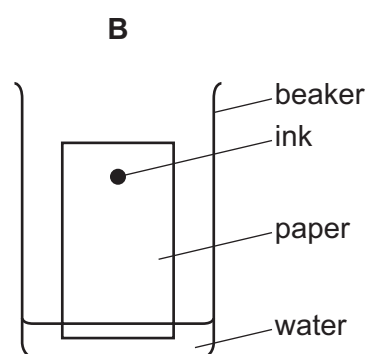
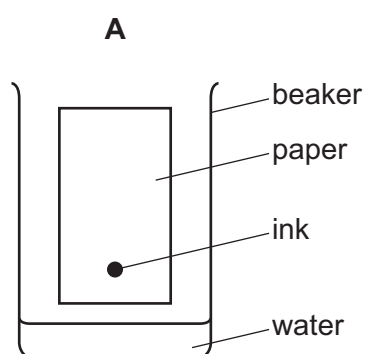
- A** Aluminium is more reactive than carbon.
- B** Aluminium is more reactive than hydrogen.
- C** Aluminium melts at  $660^{\circ}\text{C}$ .
- D** Aluminium resists corrosion.

**25** Which piece of apparatus is used to measure exactly  $20.6\text{ cm}^3$  of water?

- A** measuring cylinder
- B** burette
- C** graduated beaker
- D** syringe

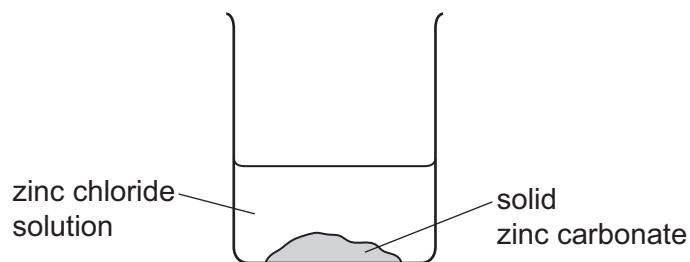
**26** Chromatography separates ink into different colours.

Which diagram shows how the apparatus is set up?



- 27** Excess solid zinc carbonate is added to dilute hydrochloric acid in a beaker.

When the reaction is complete, the beaker contains a mixture of unreacted solid zinc carbonate in a solution of zinc chloride.



Which processes are used to obtain crystals of zinc chloride from this mixture?

- A** filtration and distillation
  - B** filtration and evaporation
  - C** filtration and oxidation
  - D** oxidation and evaporation
- 28** A student determines the density of a small, irregularly shaped rock.

Which apparatus does the student use?

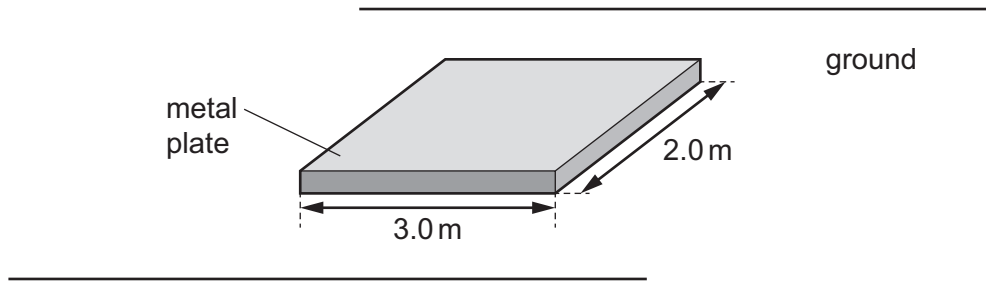
- A** balance, measuring cylinder and ruler
  - B** balance and measuring cylinder only
  - C** balance and ruler only
  - D** measuring cylinder and ruler only
- 29** The same object is moved using four different sets of conditions.

The force used, the time taken and the distance moved are measured for each set of conditions.

Which row shows the set of conditions that gives the greatest power?

	force / N	time taken / s	distance moved / m
<b>A</b>	200	20	2.0
<b>B</b>	200	40	3.0
<b>C</b>	400	10	3.0
<b>D</b>	400	30	2.0

- 30 A metal plate is 3.0 m long and 2.0 m wide.



The metal plate has a weight of 30 N and rests on the ground.

Which pressure does the metal plate exert on the ground?

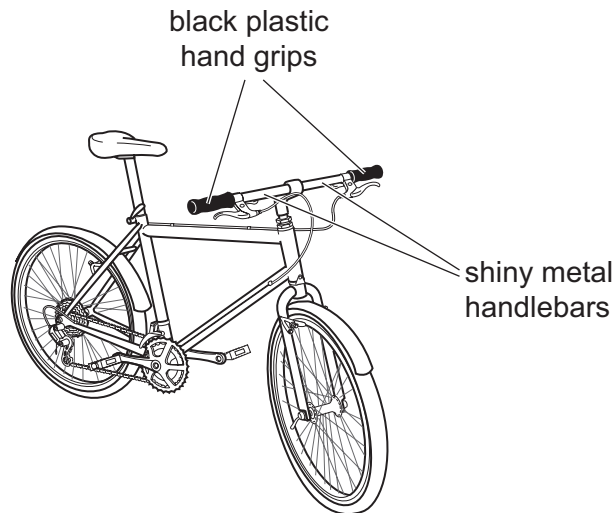
- A** 5.0 Pa      **B** 6.0 Pa      **C** 150 Pa      **D** 180 Pa

- 31 A bowl contains warm water. The water evaporates.

Which row describes where the evaporation occurs and the effect of the evaporation on the temperature of the remaining water?

	where evaporation occurs	temperature of remaining water
<b>A</b>	only on the surface	decreases
<b>B</b>	only on the surface	does not change
<b>C</b>	throughout the water	decreases
<b>D</b>	throughout the water	does not change

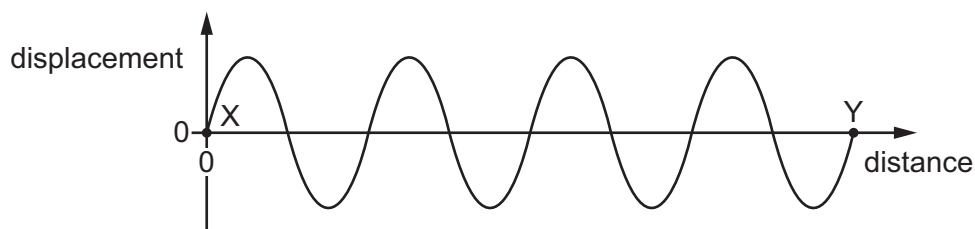
- 32 The shiny metal handlebars of a bicycle have black plastic hand grips.



On a cold day, the shiny metal handlebars feel colder than the black plastic hand grips.

Which statement explains why they feel different?

- A Metal is a better thermal conductor than plastic.
  - B Plastic is a better thermal conductor than metal.
  - C The black plastic hand grips are better emitters of radiation than the shiny metal handlebars.
  - D The shiny metal handlebars are better emitters of radiation than the black plastic hand grips.
- 33 How is thermal energy transferred by convection in a liquid?
- A by the loss of more energetic particles from the surface of the liquid
  - B by a flow of particles of the liquid
  - C by electromagnetic waves in the liquid
  - D by a vibration of particles of the liquid
- 34 The diagram shows part of a wave. Two points are labelled X and Y.



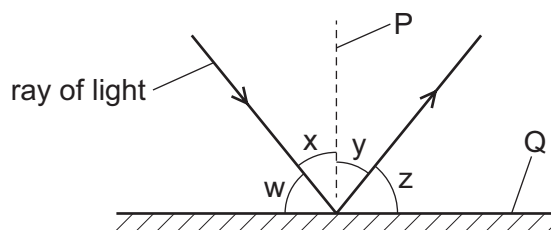
There are four wavelengths between X and Y. In 2.0 s, all four wavelengths pass point Y.

What is the frequency of the wave?

- A 0.50 Hz
- B 2.0 Hz
- C 4.0 Hz
- D 8.0 Hz

- 35 The diagram shows a ray of light reflected by a plane mirror.

Four angles,  $w$ ,  $x$ ,  $y$  and  $z$ , are labelled. Two lines,  $P$  and  $Q$ , are labelled.



Which row shows the labels for the angle of incidence, the angle of reflection and the normal?

	angle of incidence	angle of reflection	normal
<b>A</b>	$w$	$z$	$P$
<b>B</b>	$w$	$z$	$Q$
<b>C</b>	$x$	$y$	$P$
<b>D</b>	$x$	$y$	$Q$

- 36 An astronaut is outside a space station in the vacuum of space. The astronaut is wearing a spacesuit.

A second astronaut is inside the space station. This astronaut makes a knocking sound against the inside metal walls of the space station.

Which statement explains why the astronaut outside the space station does **not** hear this sound?

- A** Sound cannot travel through the air inside the space station.
  - B** Sound cannot travel through the metal walls of the space station.
  - C** Sound cannot travel through the spacesuit of the astronaut.
  - D** Sound cannot travel through the vacuum outside the space station.
- 37 An electrical device has a label with the information shown.

50 W, 1100  $\Omega$ , 230 V

Which information does the label provide?

- A** current, power and resistance
- B** current, power and voltage
- C** current, resistance and voltage
- D** power, resistance and voltage

38 Which equation relates the resistance  $R$  of a resistor to the current  $I$  in the resistor and the voltage  $V$  across the resistor?

- A**  $R = \frac{I}{V}$       **B**  $R = IV$       **C**  $R = \frac{1}{(IV)}$       **D**  $R = \frac{V}{I}$

39 Which electrical device is used to protect a circuit?

- A** ammeter  
**B** battery  
**C** fuse  
**D** voltmeter

40 What is a description of the Sun and what does the Sun mostly consist of?

	description	mostly consists of
<b>A</b>	small mass star	hydrogen and helium
<b>B</b>	small mass star	hydrogen and oxygen
<b>C</b>	large mass star	hydrogen and helium
<b>D</b>	large mass star	hydrogen and oxygen

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The Periodic Table of Elements

Group																																																																															
I	II											III	IV	V	VI	VII	VIII																																																														
<div>1 H hydrogen 1</div> <div>Key<div>atomic number atomic symbol name relative atomic mass</div></div>																																																																															
3 Li lithium 7	4 Be beryllium 9																																																																														
11 Na sodium 23	12 Mg magnesium 24	13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40	19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84	37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium —	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131	55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium —	85 At astatine —	86 Rn radon —	87 Fr francium —	88 Ra radium —	89–103 actinoids	104 Rf rutherfordium —	105 Db dubnium —	106 Sg seaborgium —	107 Bh bohrium —	108 Hs hassium —	109 Mt meitnerium —	110 Ds darmstadtium —	111 Rg roentgenium —	112 Cn copernicium —	113 Nh nihonium —	114 Fl flerovium —	115 Mc moscovium —	116 Lv livermorium —	117 Ts tennessine —	118 Og oganeson —

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium —	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
	89 Ac actinium —	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium —	94 Pu plutonium —	95 Am americium —	96 Cm curium —	97 Bk berkelium —	98 Cf californium —	99 Es einsteinium —	100 Fm fermium —	101 Md mendelevium —	102 No nobelium —	103 Lr lawrencium —

The volume of one mole of any gas is 24 dm<sup>3</sup> at room temperature and pressure (r.t.p.).