



YEAR 8 SCIENCE WEEK 4 HOMEWORK 1 & 2.

ANSWER THE QUESTIONS BEHIND YOUR EXERCISE BOOK OR ON THE PAPER ITSELF.

TITLE YOUR WORK APPROPRIATELY AND UNDERLINE IT.

Science Paper 1

Stage 8

45 minutes

Name

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.

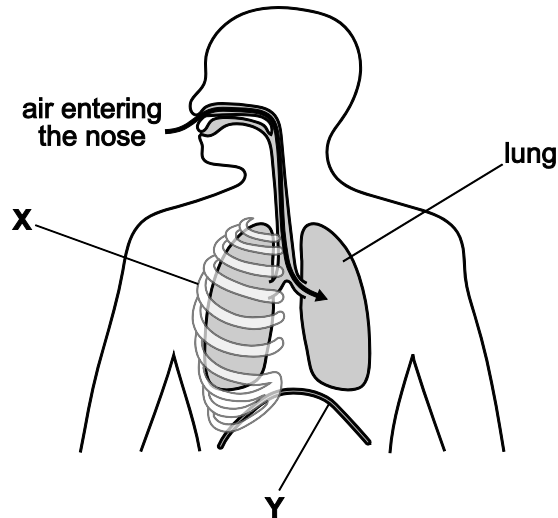
INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].

YEAR 8 SCIENCE WEEK 4 HOMEWORK 1.

ANSWER QUESTIONS 1 TO 6 BEHIND YOUR EXERCISE BOOK OR ON THIS.
TITLE YOUR WORK APPROPRIATELY AND UNDERLINE IT.

- 1 The diagram shows part of the human respiratory system.



- (a) (i) The structures labelled **X** and **Y** change the volume of the lungs during breathing.

Name the structures **X** and **Y**.

X is

Y is

[2]

- (ii) Describe how structures **X** and **Y** move to **increase** the volume of the lungs.

.....

.....

..... [2]

- (b) Mike and Rajiv plan an investigation to find out how running speed affects breathing rate.

- (i) Name the equipment they must use to measure their breathing rate.

..... [1]

- (ii) State one variable they need to **change**.

..... [1]

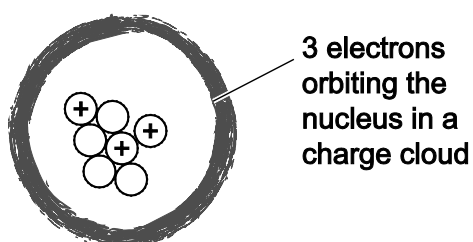
- (iii) State one variable they need to keep the **same**.

..... [1]

- (iv) Suggest one way they record and present their results.

..... [1]

- 2 Aiko draws a diagram of an atom of lithium.



NOT TO SCALE

- (a) The electrons in the charge cloud are held in position.

They do **not** escape from the atom.

Explain why the electrons in the charge cloud cannot escape from the atom.

Use ideas about the charges on the particles in the atom.

.....

.....

..... [2]

- (b) Aiko wants to draw a diagram of an atom of **sodium**.

Describe two ways an atom of sodium is **different** from an atom of lithium.

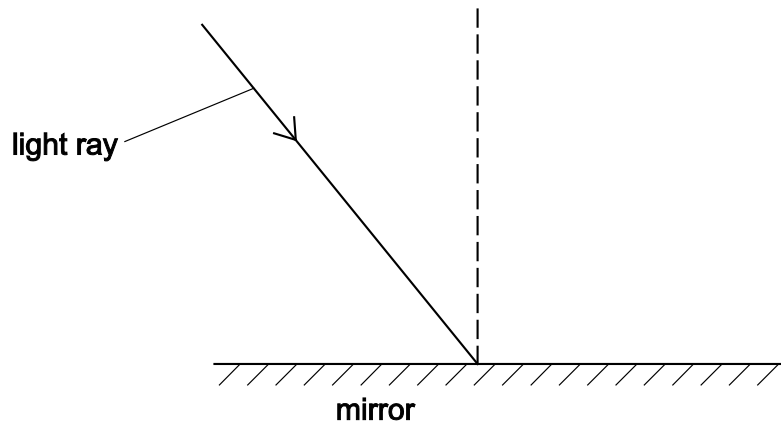
1

2

[2]

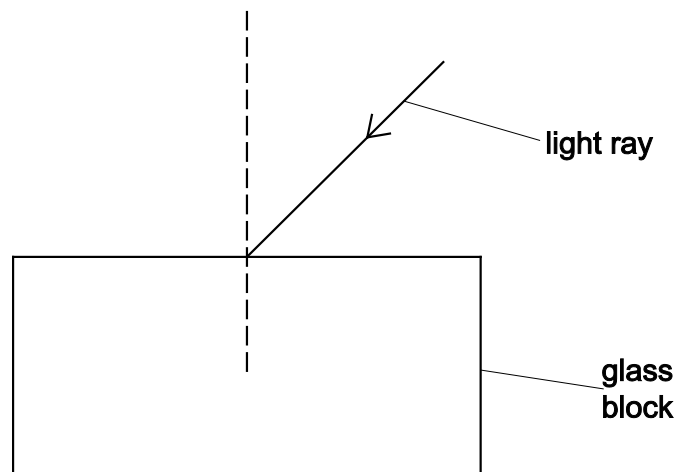
3 Carlos investigates what happens when light hits a mirror and when light hits a glass block.

- (a) (i) Complete the diagram to show what happens to a light ray that hits the surface of a mirror.



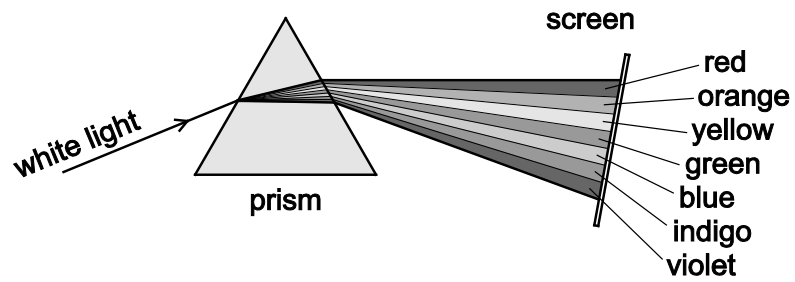
[1]

- (ii) Complete the diagram to show what happens to a light ray that hits and then goes through a glass block.



[2]

- (b) When white light goes through a prism, the light is refracted and split into the colours of the rainbow.



What is the name of this process?

..... [1]

4 Here is some information about a loaf of bread.

component	amount per 100 g of bread
energy	970 kJ
protein	8.0 g
carbohydrate	51 g
fat	1.7 g
dietary fibre	3.5 g
salt	1.4 g

(a) Why does the body need a supply of protein?

..... [1]

(b) The total mass of protein, carbohydrate, fat, dietary fibre and salt in the table does **not** add up to 100 g.

What substance makes up the remaining mass of bread?

..... [1]

(c) (i) Calculate the amount of energy provided by 20 g of bread.

..... kJ [1]

(ii) Which component in the bread provides most of this energy?

..... [1]

(d) Rajiv eats 50 g of bread.

This provides 5% of his recommended daily amount (RDA) of protein.

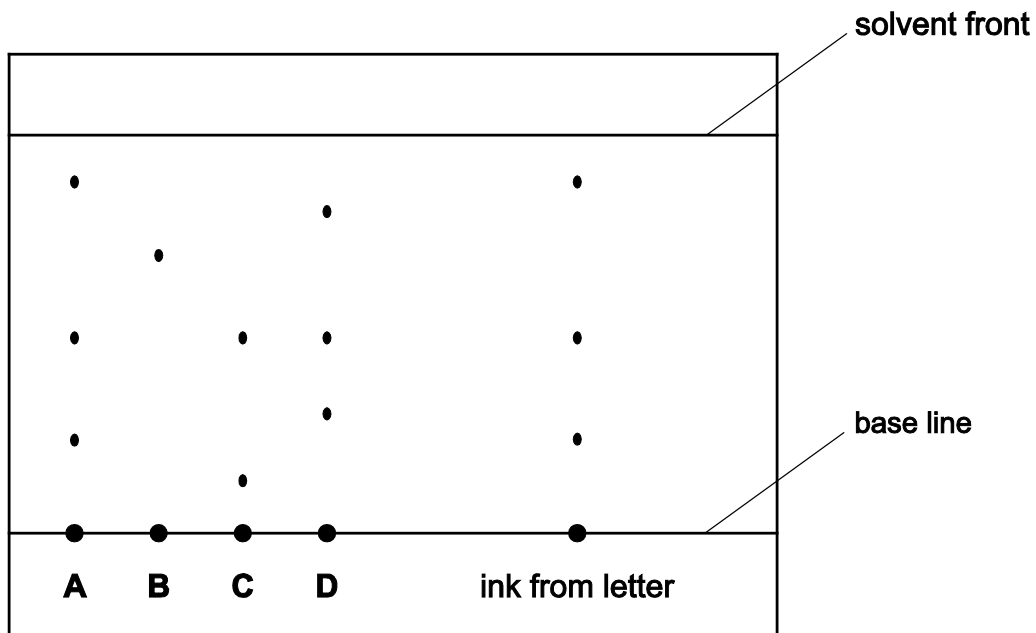
What is Rajiv's RDA of protein?

..... g [2]

- 5 Lily investigates the ink on a letter.

She uses paper chromatography to separate the dyes in some inks.

Look at the results of Lily's experiment.



- (a) Describe how paper chromatography separates the dyes in ink.

.....
 [1]

- (b) Which ink was used to write the letter?

Choose from **A**, **B**, **C** or **D**.

.....

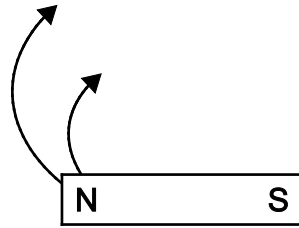
Explain how you can tell.

.....

[2]

6 This question is about magnets.

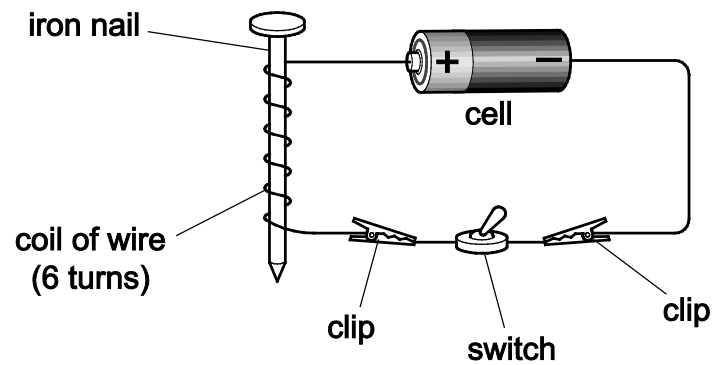
(a) On the diagram of the bar magnet, complete the **two** magnetic field lines shown.



[1]

(b) Jamila makes an electromagnet.

Look at the diagram for her electromagnet.



The electromagnet attracts steel paperclips.

Jamila wants to make her electromagnet **stronger**.

Write down **two** ways she can make her electromagnet stronger.

- 1
- 2

[2]

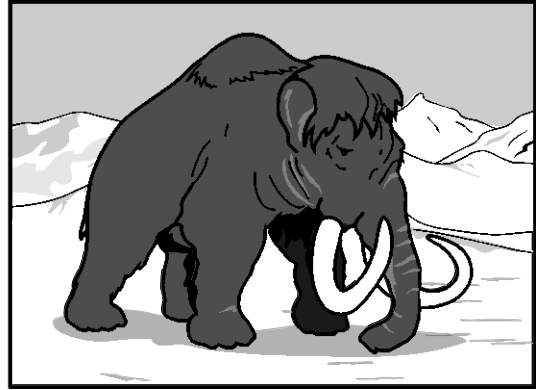
YEAR 8 SCIENCE WEEK 4 HOMEWORK 2.

ANSWER QUESTIONS 7 TO 12 BEHIND YOUR EXERCISE BOOK OR ON THIS. TITLE YOUR WORK APPROPRIATELY AND UNDERLINE IT.

- 7 The drawings, based on fossils, show an iguanodon and a woolly mammoth.



Iguanodon lived
120 million years ago



Woolly mammoth lived
4000 years ago

These animals **both** lived in the **same** parts of Europe but at **different** times.

Both animals are now extinct.

Scientists think that the Earth's climate cycles between warm and cold periods of time.

- (a) Does the fossil evidence support the idea that the Earth has cycles of warm and cold periods of time?

.....

Give **two** reasons for your answer.

- 1
- 2
-

[2]

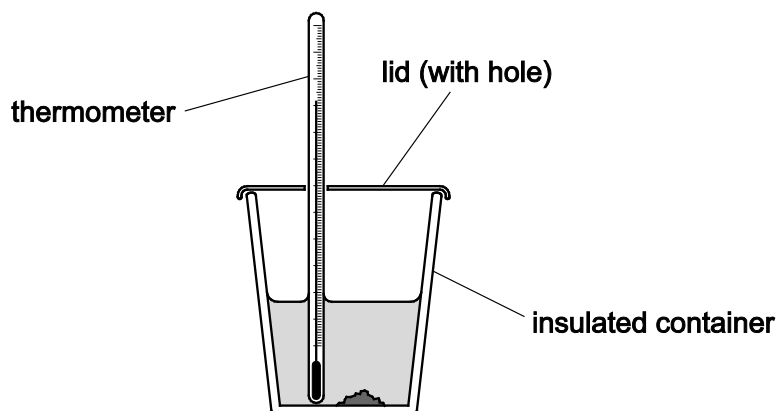
- (b) Explain if the fossil evidence supports the idea that each cycle takes a long period of time.

.....

.....

..... [1]

- 8 Ahmed investigates the energy changes when some chemicals are mixed.



He measures the temperature at the start and at the end of each reaction.

Look at his results.

mixture	temperature at start in °C	temperature at end in °C	type of reaction
A	18	26	exothermic
B	18	18	
C	18	10	

- (a) The reaction in mixture **A** is **exothermic**.

Explain how you can tell.

..... [1]

- (b) What **type** of reaction is reaction **C**?

..... [1]

- (c) Mixture **B** involves substances that are **unreactive**.

What word describes substances that are unreactive?

Circle the correct answer.

metals

non-metals

inert

explosive

[1]

- 9 Yuri runs a 100 m race.

He takes 13 seconds to run 100 m.

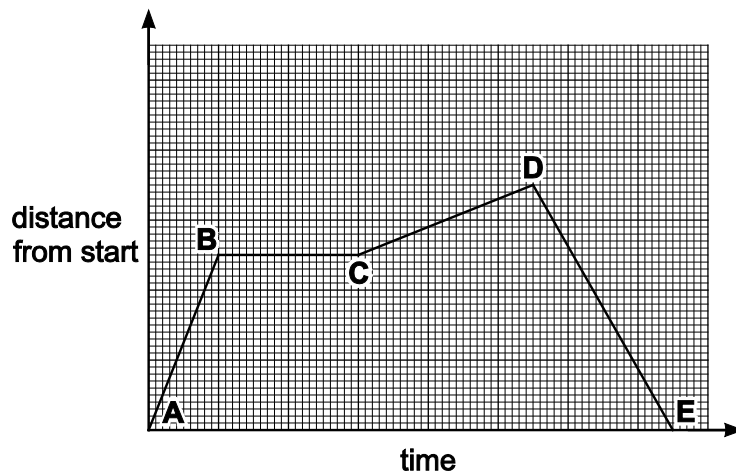
- (a) Calculate Yuri's average speed.

Include the units in your answer.

Yuri's average speed = [2]

- (b) Yuri does a run.

Look at the distance / time graph for Yuri's run.



Yuri stops for a rest.

Between which points does Yuri stop for a rest?

Tick (✓) the box next to the correct answer.

A and B

☐

B and C

☐

C and D

☐

D and E

☐

[1]

10 Read the information about the Solar System.

- Earth is one of the eight major planets in the Solar System.
- Before 1554 the only known planets were Mercury, Venus, Mars, Jupiter and Saturn.
- In 1608 the first simple telescope was invented by Lippershey.
- In 1781 Uranus was discovered by Herschel.
- In 1801 Piazzi discovered the first asteroid.
- Some time later a ring of asteroids was discovered in orbit between Mars and Jupiter. This is called the asteroid belt.
- Asteroids vary in size and shape.
- In 1846 Neptune was discovered by Galle.

Use the information to help you to answer the questions.

(a) Suggest why astronomers did **not** discover the asteroid belt until the early 1800s.

.....
 [1]

(b) Circle the name of the scientist who discovered the first asteroid.

Galle Herschel Lippershey Piazzi

[1]

(c) (i) What are asteroids made of?

..... [1]

(ii) Why are asteroids **not** classified as planets?

..... [1]

(d) Modern telescopes have a much larger magnification than the first telescopes.

Suggest **two** ways modern telescopes help to improve our knowledge of asteroids and the asteroid belt.

1

.....

2

.....

[2]

11 Chemical formulae are used to model chemical compounds.

The chemical formula for glucose is $\text{C}_6\text{H}_{12}\text{O}_6$.

A molecule of glucose contains:

- 6 atoms of carbon, C
- 12 atoms of hydrogen, H
- 6 atoms of oxygen, O.

A molecule of sulfuric acid contains:

- 2 atoms of hydrogen, H
- 1 atom of sulfur, S
- 4 atoms of oxygen, O.

(a) Write the chemical formula for sulfuric acid.

formula [1]

(b) The concentration of a solution of glucose depends on how many glucose particles are present in 1 cm^3 of water.

An **analogy** for concentration is how many children are in a room.

(i) What is meant by an analogy?

.....
 [1]

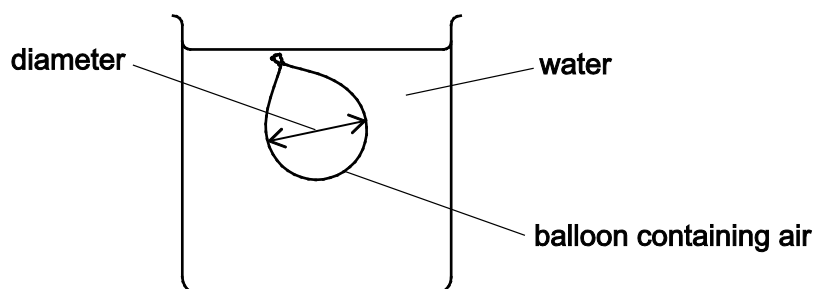
(ii) Describe how the analogy of children in a room can be used to model a high concentration solution and a low concentration solution.

high concentration

 low concentration
 [2]

12 Safia investigates how changing the temperature affects the volume of a gas.

She places a sealed balloon in water at two different temperatures.



She uses water at 10 °C and at 50 °C.

She measures the diameter of the balloon at both temperatures.

Predict what happens to the diameter of the balloon as the temperature of the water increases.

Prediction

.....

Explain your answer. Use ideas about particles.

.....

.....

.....

[3]

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The Periodic Table of Elements

Group																		
I	II											III	IV	V	VI	VII	VIII	
3 Li lithium 7	4 Be beryllium 9	<div>Key</div> <div>atomic number atomic symbol name relative atomic mass</div>										1 H hydrogen 1						
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 oganesson —	

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 —

actinoids

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).