Cambridge Assessment International Education

Science

Stage 7

Paper 1

2024

Cambridge Lower Secondary Progression Test

Name

Class

Date

45 minutes

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 [ ].

1 This question is about animal and plant cells.

(a) Look at the diagram of an **animal** cell.

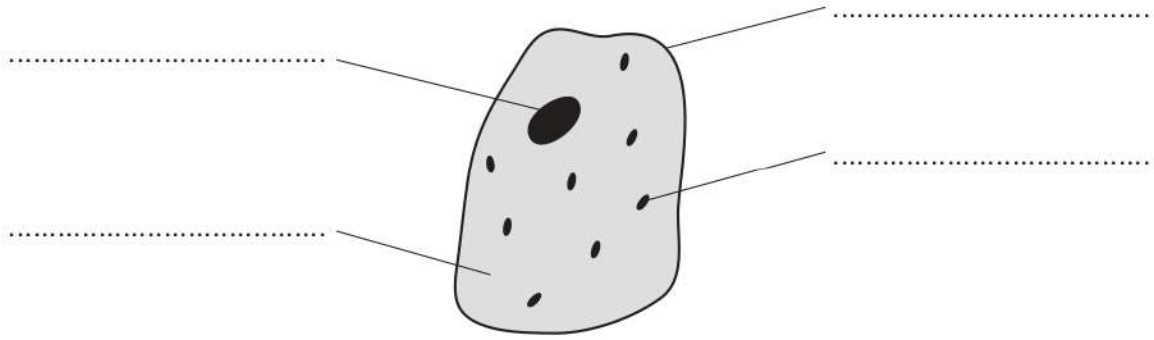
Complete the labels on the diagram.

Choose from the list.

cell wall **chloroplast**

cytoplasm **mitochondrion** **nucleus**

cell membrane **sap vacuole**



[2]

(b) Name **two** cell structures that are **only** found in **plant** cells.

1 .....

2 .....

[2]

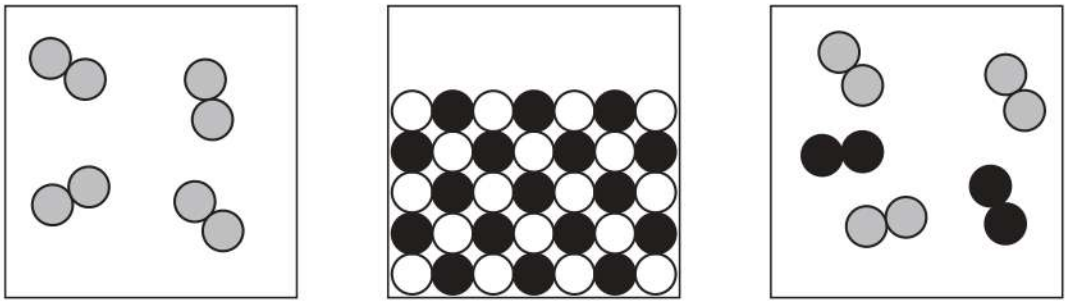
(c) What is the function of mitochondria in cells?

.....

..... [1]

2 Look at the particle models of some substances.

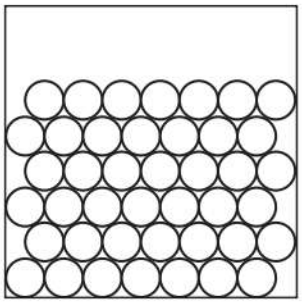
The circles ◯, ● and ○ represent different types of atoms.



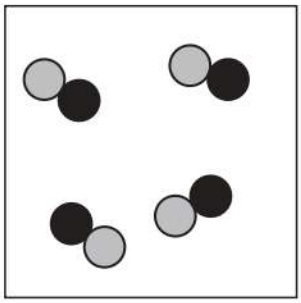
A

B

C



D



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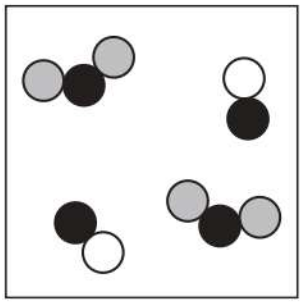


F

(a) Which particle model represents a solid element?

.....

[1]

(b) Which particle models represent pure compounds?

..... and .....

Explain your answer.

.....

.....

.....

[2]

(c) Which particle model represents a mixture of elements?

.....

[1]

(d) Which particle model represents a mixture of compounds?

.....

[1]

[Turn over

(e) Mercury is a liquid at room temperature.

The circle ◐ represents an atom of mercury.

Draw in the box the particle model of mercury at room temperature.

[1]

(f) Steel is an alloy.

Explain the meaning of the word **alloy**.

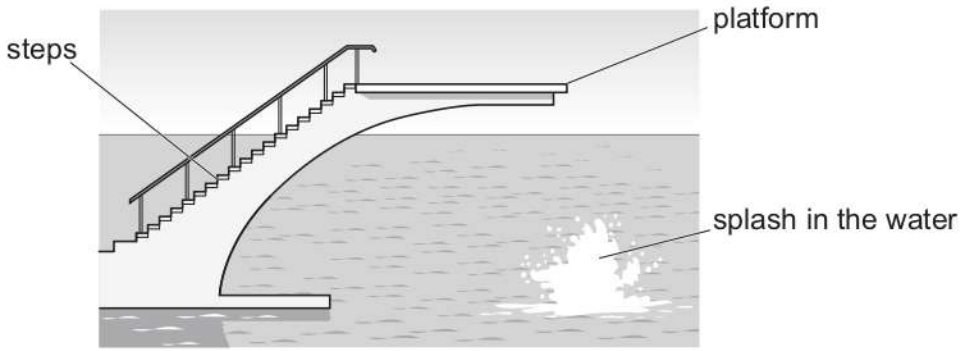
.....

.....

..... [2]

3 During an activity there are changes in energy.

Oliver climbs up the steps, walks along the platform and jumps into the water.



(a) Complete the sentences to describe the changes in energy.

Choose from the list.

chemical **electrical** **sound** **thermal**

When Oliver makes a splash in the water, some of his energy is converted into ..... energy and some into ..... energy.

[2]

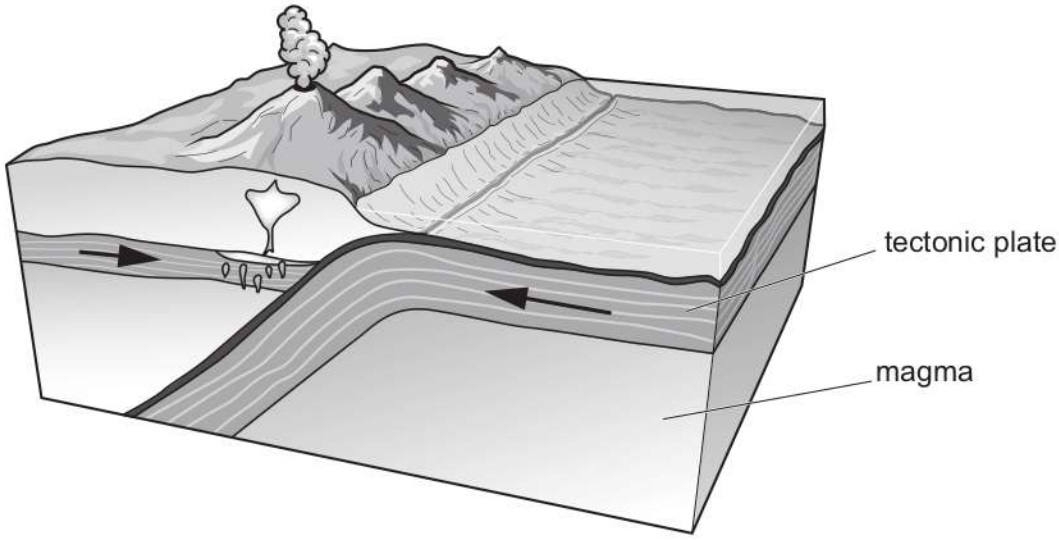
(b) Energy dissipates during an activity.

What does this mean?

.....

..... [1]

4 Look at the diagram of a model of a tectonic plate boundary.



(a) Describe **three** events that occur near this type of tectonic plate boundary.

1 .....

2 .....

3 .....

[3]

(b) Complete the sentences about the model of plate tectonics.

Choose from the list.

atmosphere	**magma**
core	**mantle**
crust	**water**

The solid outer layer of the Earth consists of the .....

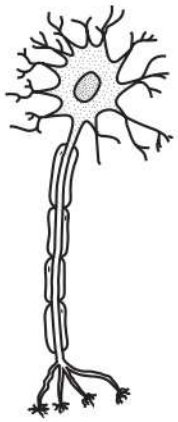
and the upper part of the .....

The solid outer layer of the Earth has tectonic plates that move.

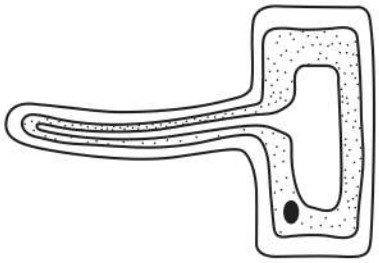
The tectonic plates move because of ..... flow in the mantle.

[2]

5 Look at the diagrams of two specialised cells.



cell **A**



root hair cell

NOT TO SCALE

(a) What is the name of cell **A**?

.....[1]

(b) Explain how the structure of the root hair cell is adapted to its function.

.....

.....

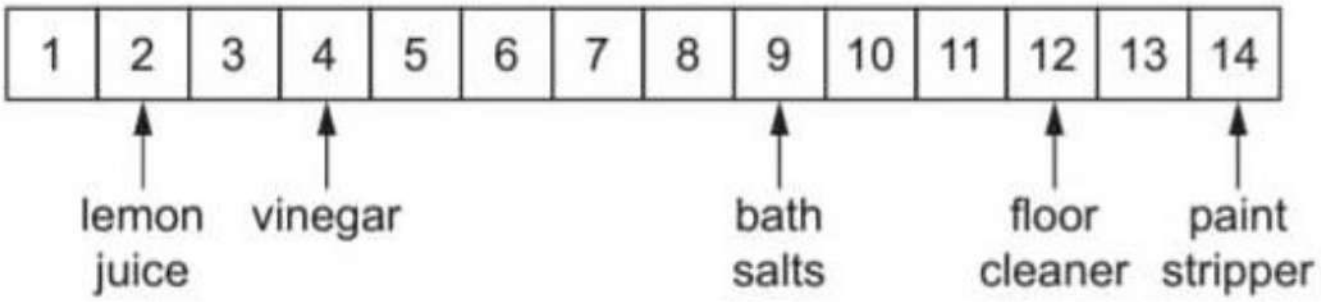
.....

.....

.....[2]

6. Chen tests some chemicals with Universal Indicator.

His results are shown on a pH chart.



Use the pH chart to answer the questions.

a. Write down the pH of vinegar

_____ [1]

b. Paint stripper is tested with Universal Indicator.

Write down the colour of the Universal Indicator after the test.

_____ [1]

c. Pure water is neutral.

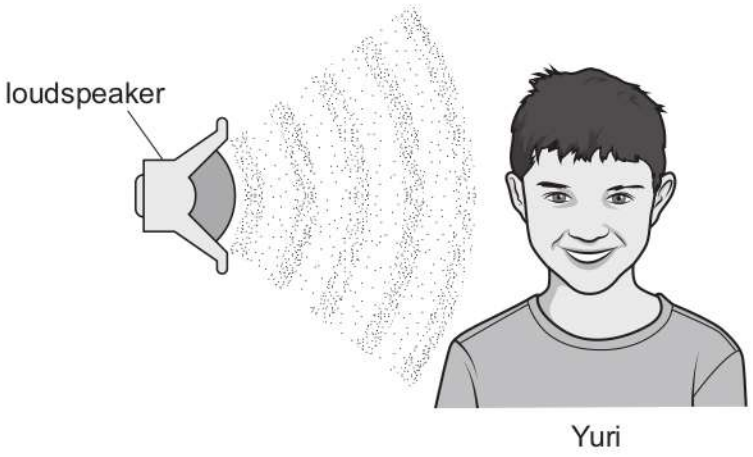
Write down the pH of a neutral solution.

_____ [1]

d. Which chemical in the pH chart is the most acidic?

_____ [1]

7 Yuri draws a diagram to show how he hears the sound made by a loudspeaker.



The dots in the diagram represent air particles.

(a) Describe what happens to air particles when the loudspeaker makes a sound.

.....

.....

.....

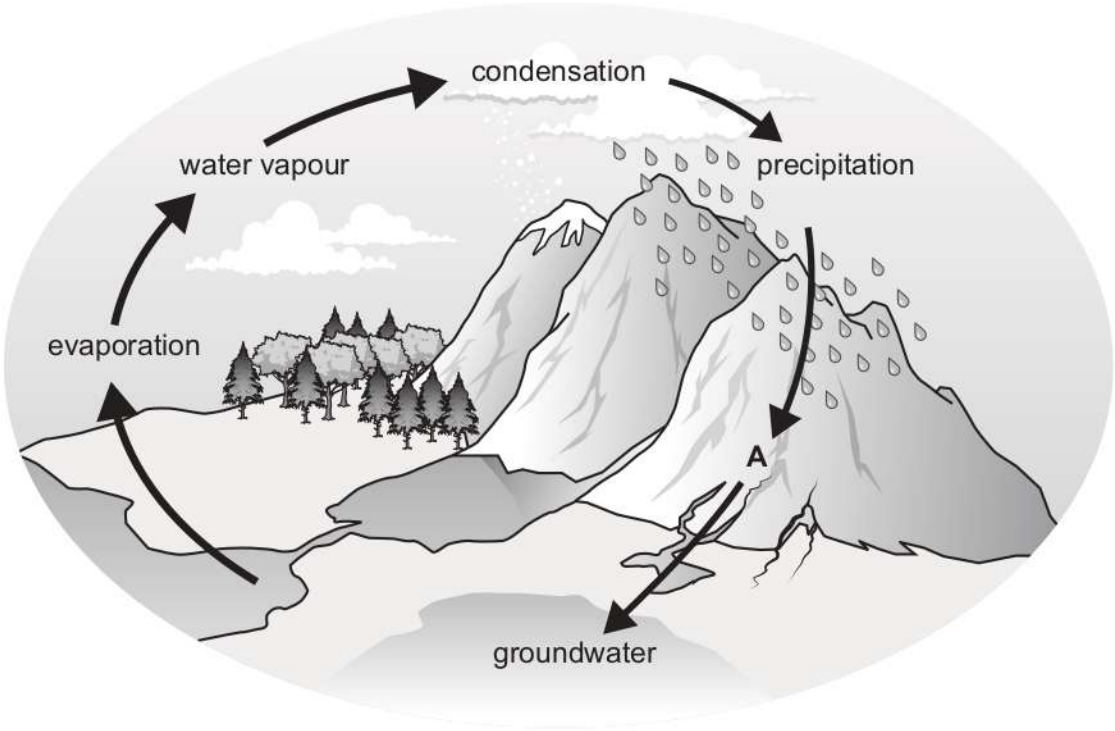
..... [2]

(b) Explain why sound does **not** travel through a vacuum.

.....

..... [1]

8 The diagram shows part of the water cycle.



(a) Identify and describe process **A**.

process **A** .....

description .....

.....

[2]

(b) Draw a straight line to match each **process** to its correct **description**.

process	description
precipitation	the process of water vapour changing into liquid water
condensation	the process of liquid water changing into water vapour
evaporation	the process by which water falls from clouds

[2]

9 Class 7 investigate growth in plants.

(a) The class use secondary information sources.

What is a secondary information source?

.....

..... [1]

(b) Class 7 investigate the growth of five different plant species.

In their first experiment the teacher:

- fills a plant pot with soil
- puts 5 seeds of a plant species into the soil
- waters the soil
- leaves the seeds for 10 days to grow into seedlings.

The teacher repeats the experiment four more times using different plant species.

Mia and Jamila each choose different ways to measure the growth of the seedlings.

Mia finds the mass of each plant pot and soil before and after the 10 days.

Jamila measures the height of the seedlings after 10 days and calculates the average height.

(i) Explain why Mia's method of measuring the growth does **not** give accurate results.

.....

..... [1]

(ii) Explain why Jamila's results are reliable.

.....

..... [1]

(iii) Describe and explain **one** safety precaution the teacher takes in this investigation.

safety precaution .....

.....

explanation .....

.....

[2]

10 Mike investigates three substances, milk, vinegar and bleach.

He wants to know the pH of each of the three liquids.

Write down how Mike does this investigation.

Include:

- the names of any chemicals he uses
- the method
- how Mike is able to make a conclusion from his results.

.....

.....

.....

.....

.....

..... [3]

11. Energy is transferred from one form into another.

a. The diagram shows a television.

Complete the energy transfer for the television.

_____ energy

_____energy ⟶ _____ energy

_____ energy

[1]

b. A car transfers chemical energy in gasoline (petrol) into thermal energy, sound energy and kinetic energy only.

The car transfers 100J of chemical energy into 70J of thermal energy and 10J of sound energy.

1. Calculate how much chemical energy is transferred into kinetic energy.

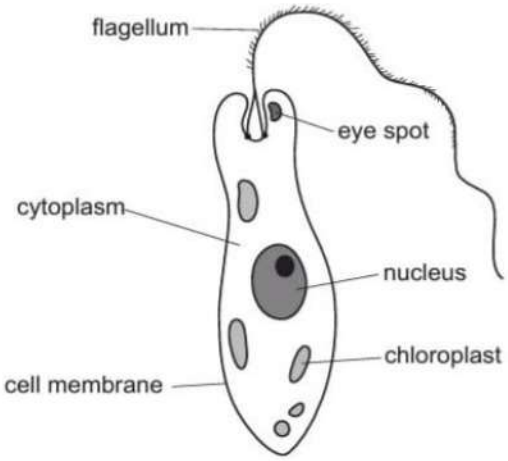
_____ J [1]

2. Describe what happens to the sound and thermal energy.

_____ [1]

3. Euglena is a single-celled organism.

   Look at the diagram of an euglena.



   Explain why euglena is difficult to classify as either a plant cell or an animal cell.

   _____

   _____ [1]

12 Complete the sentence about tidal forces on Earth.

Tidal forces on Earth are due to the ..... force of attraction between the Earth, ... and ..... .

[2]

13 Describe the difference between electrical conductors and electrical insulators.

Use the idea of electrons in your answer.

.....

.....

..... [1]

The Periodic Table of Elements

Group																	
1	2											3	4	5	6	7	8
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
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 –

Key

atomic number
atomic symbol
name
relative atomic mass

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
actinoids	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 –