

## GCSE Transition Assessment

### Part A: Subject knowledge

Time allowed: **45 minutes**

**First name :**

**Surname :**

**Teacher :**

**Teaching group :**

#### Instructions

- Use black ink.
- Fill in your name, teacher and teaching group in the boxes above.
- Answer all questions.
- Answer the questions in the spaces provided.
- You may use a calculator.

#### Information

- The assessment is 45 minutes long.
- There are separate sections for Biology, Chemistry and Physics.
- The maximum mark for this assessment is 60.
- The marks available for each question are shown in brackets [ ].

**Biology marks** /20

**Chemistry marks** /20

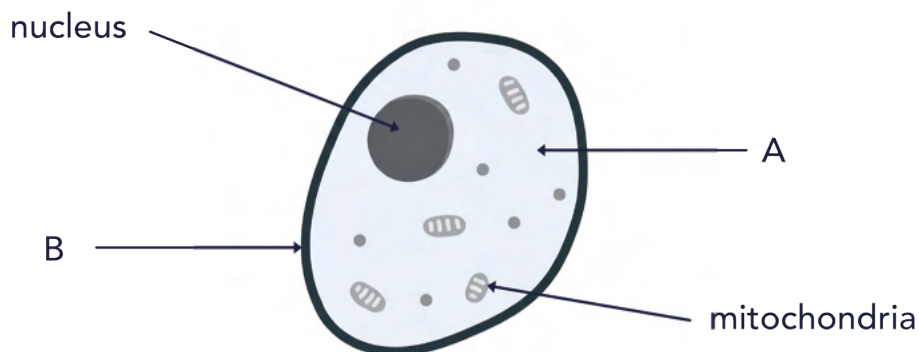
**Physics marks** /20

**Total marks** /60



# Biology

1. This diagram shows the structure of an animal cell.



1.a Give the name of structures A and B.

A: .....

B: .....

[2]

1.b The nucleus and mitochondria are labelled on the cell diagram.

Draw **one** line from each structure to the correct function.

## Structure

## Function

Nucleus

Mitochondria

Carries out photosynthesis

Contains genetic material

Controls substances moving in and out of the cell

Keeps the cell rigid

Carries out respiration

[2]

/ 4

2. This question is about **respiration**.

2.a Complete the sentence to describe respiration.  
Choose the correct answer from the box.

<b>biomass</b>	<b>cells</b>	<b>energy</b>	<b>glucose</b>
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Respiration supplies living things with the .....  
they need for living processes.

[1]

2.b One type of respiration is **aerobic** respiration.

Complete the word equation for aerobic respiration.

glucose + ..... → ..... + water

[2]

2.c Another type of respiration is **anaerobic** respiration.

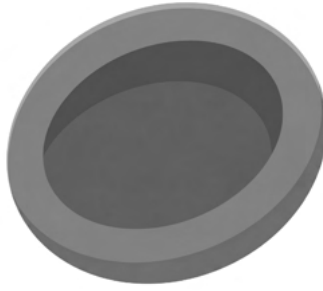
What is the product of anaerobic respiration in humans?

.....

[1]

/ 4
-----

3. The diagram shows a **red blood cell**.



3.a Oxygen can move in and out of the cell by **diffusion**.

What is meant by the term "diffusion"?

.....

.....

.....

[1]

3.b Which diagram shows the direction of movement of oxygen into the red blood cell by diffusion?

Tick **one** box.

Direction of movement

Oxygen

The four diagrams show a red blood cell with oxygen molecules (small grey dots) outside. In the first, an arrow points up into the cell. In the second, an arrow points down out of the cell. In the third, an arrow points up into the cell, but there are more dots inside than outside. In the fourth, an arrow points down out of the cell, but there are more dots inside than outside.

[1]

3.c

Which statement describes another example of diffusion?

Tick **one** box.

Food moving through the oesophagus due to muscle movement

Blood plasma being pumped around the body by the heart

Carbon dioxide moving from the blood into the lungs

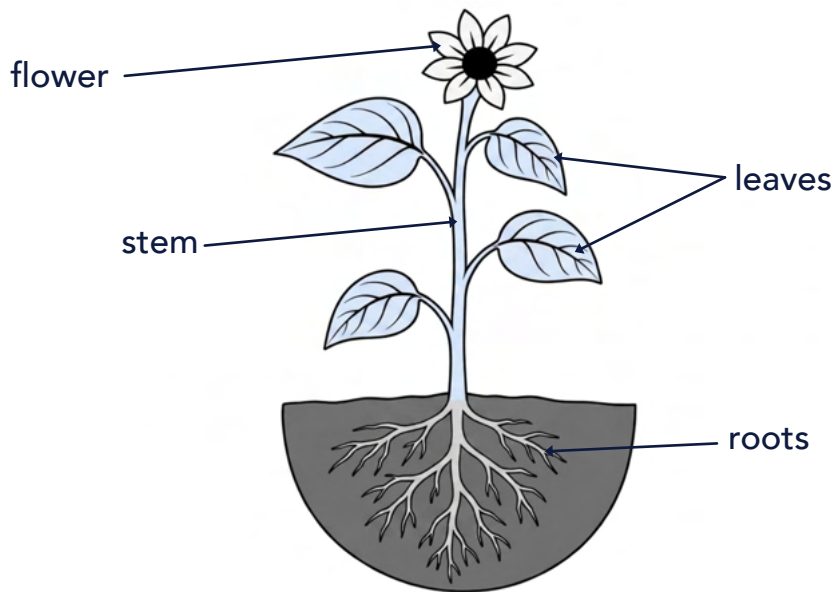
Sperm swimming towards an egg cell

[1]

/ 3

4.

This diagram shows a plant.  
Some of the plant organs are labelled.



4.a

Which plant organ is where photosynthesis mostly happens?

Tick **one** box.

Roots

Flower

Leaves

Stem

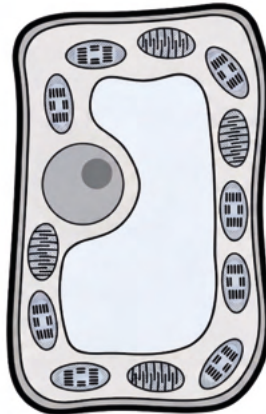
[1]

**4.b** Complete the word equation for photosynthesis.

..... + ..... → ..... + .....

[2]

**4.c** This diagram shows a cell from the plant organ where photosynthesis occurs.



What feature of a cell allows it to carry out photosynthesis?

.....  
.....

[1]

/ 4

**Questions continue on next page**

5. A student is investigating the similarities and differences between two puppies.



- 5.a They notice that there are differences between the puppies.

What are these differences called?

Tick **one** box.

Adaptations

Mutations

Variations

Biodiversity

[1]

- 5.b Some differences between the puppies are shown in the table.

In the table, tick **one** box in each row to show whether it is

- inherited only
- inherited and affected by environmental conditions.

Characteristic	Inherited only	Inherited and affected by environmental conditions
Ear shape		
Fur colour		
Weight		

[1]

**5.c** Characteristics are passed to the puppies from their parents.

Give the name of the cells in animals that pass genetic information from a male and female to their offspring.

Male cell: .....

Female cell: .....

[2]

**5.d** Give the name of the molecule that contains genetic information in living things.

.....

[1]

/ 5

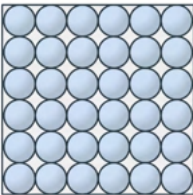
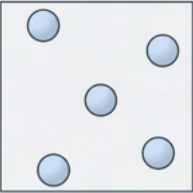
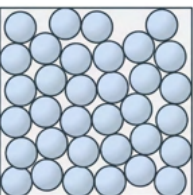

**End of Biology questions.**



# Chemistry

1. The three states of matter are **solid**, **liquid** and **gas**.

1.a Draw **one** line from each state of matter to its particle model.

State	Particle model
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Solid</div>	
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Liquid</div>	
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Gas</div>	
	

[2]

1.b A student placed 150 g of liquid water in a beaker. They heated the water until it all changed to a gas.

What mass of gaseous water would be produced?

..... g

[1]

1.c What is the change of state from a liquid to a gas called?

.....

[1]

1.d

Water contains two types of atoms.  
The atoms are chemically combined together in fixed proportions.

What type of substance is water?

Tick **one** box.

Metallic element

Mixture

Compound

Non-metallic element

[1]

/ 5

2.

This question is about the reactions of metals and metal compounds.

2.a

A piece of zinc metal reacts with hydrochloric acid.  
Hydrogen and zinc chloride form.

Which word equation shows this reaction?

Tick **one** box.

zinc + hydrogen  $\longrightarrow$  zinc chloride + hydrochloric acid

zinc chloride + hydrogen  $\longrightarrow$  zinc + hydrochloric acid

zinc chloride + hydrochloric acid  $\longrightarrow$  zinc + hydrogen

zinc + hydrochloric acid  $\longrightarrow$  zinc chloride + hydrogen

[1]

2.b

Sodium reacts with oxygen to produce sodium oxide.

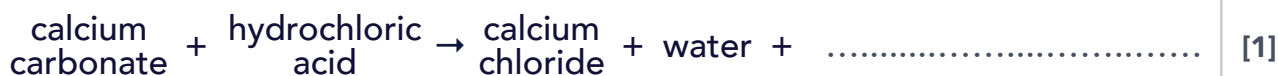
Balance the symbol equation for this reaction.



[1]

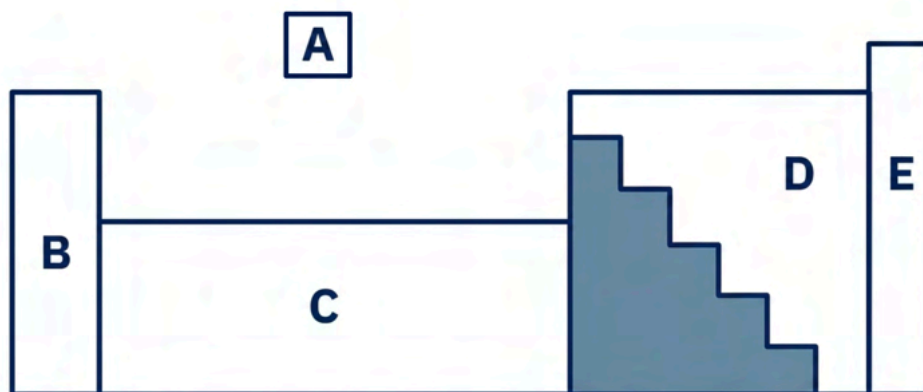
2.c Calcium carbonate reacts with hydrochloric acid to produce a gas.

Complete the word equation for this reaction.



/ 3

3. This is a representation of the Periodic Table.



3.a The shaded area contains only **metal** elements.

Which other areas contain only metal elements?

Tick **two** boxes.

A

B

C

D

E

[2]

3.b The elements in the Periodic Table are sorted into rows and columns.

What name is given to the columns of the Periodic Table?

..... [1]

**3.c** One metal shown on the Periodic Table is mercury.  
Some properties of mercury are given below.

Which property of mercury is **not** a typical property for a metal?

Tick **one** box.

It can conduct electricity

It is shiny

It is a good thermal conductor

It is a liquid at room temperature

[1]

**3.d** Mercury reacts with oxygen to produce mercury oxide.  
A student completely reacts the following masses of  
mercury and oxygen together.

Chemical	Mass (g)
Mercury	40.2
Oxygen	3.2
Mercury oxide	?

What mass of mercury oxide is produced?

..... g

[1]

/ 5

4. This question is about mixtures and pure substances.

4.a Draw **one** line from each description to the correct diagram.

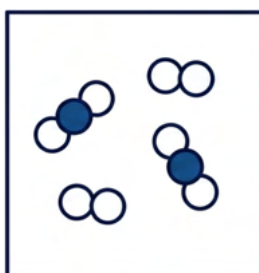
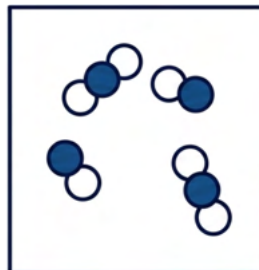
**Description**

**Diagram**

A mixture of elements

A mixture of compounds

A mixture of an element  
and a compound



[2]

4.b In chemistry, what is meant by a "pure substance"?

.....

.....

.....

[1]

4.c Air is a mixture of gases.

Which statements best describe the particles in a gas?

Tick **two** boxes.

They move quickly in all directions

They flow over each other

They vibrate in fixed positions

They are far apart

They are held in fixed positions

They are touching

[2]

4.d One component of the air has the chemical formula  $\text{CH}_4$ .

How many atoms are there in the formula  $\text{CH}_4$ ?

.....

[1]

4.e The formula of some other components in air are given below.

Which formula corresponds to an element?

Tick **one** box.

$\text{H}_2\text{O}$

$\text{CO}_2$

$\text{O}_2$

$\text{CO}$

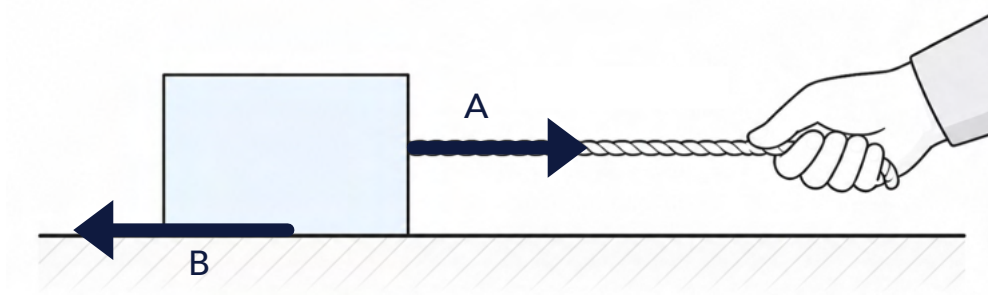
[1]

**End of Chemistry questions.**

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# Physics

1. A student pulls a wooden block along a surface with a rope. The arrows show two opposing forces acting on the block.



1.a Draw **one** line from each arrow to the name of the force.

Arrow	Force
	<input type="text" value="normal contact force"/>
<input type="text" value="A"/>	<input type="text" value="thrust"/>
	<input type="text" value="friction"/>
<input type="text" value="B"/>	<input type="text" value="tension"/>
	<input type="text" value="magnetic force"/>

[2]

- 1.b When the student starts to pull the block along, energy is transferred.

Complete the sentences to describe the energy transfers. Choose words from the box.

**gravitational      elastic      kinetic      nuclear      thermal**




The main energy store to increase is the  
..... energy store of the block.

Some energy is also wasted and is transferred to the  
..... energy stores of the block and air.

[2]

**1.c** When the block is stationary, the student exerts different forces on the block.  
The size and direction of the forces are shown in each diagram.

Tick **one** box in each row to show how the block will move.

Forces	Moves left (←)	Moves right (→)	Does not move
			
			
			

[3]

/ 7

**2.** A student kicks a ball in the air.

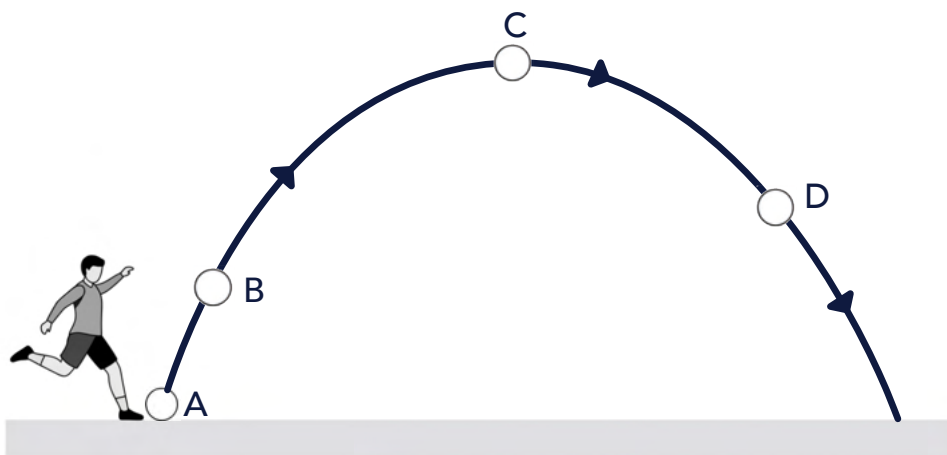


**2.a** Complete the sentence to describe the main energy transfer as the student kicks the ball.

When the student kicks the ball, energy is transferred from the  
..... energy store in their muscles.

[1]

**2.b** The diagram shows the path of the ball after it is kicked.



The table shows the energy in the gravitational potential and kinetic energy stores of the ball at the stages shown on the diagram.

Stage	Gravitational potential energy (kJ)	Kinetic energy (kJ)	Total energy (kJ)
A	0	15	15
B	5	10	15
C	13	?	15
D	7.5	7.5	15

Calculate the missing kinetic energy value at stage C.

..... kJ [1]

**2.c** As the ball moves, there is **no** loss of energy to the surroundings.

How do the values in the table show this?

.....  
 .....  
 .....

[1]

2.d

Give the name of the force that causes the ball to speed up as it falls.

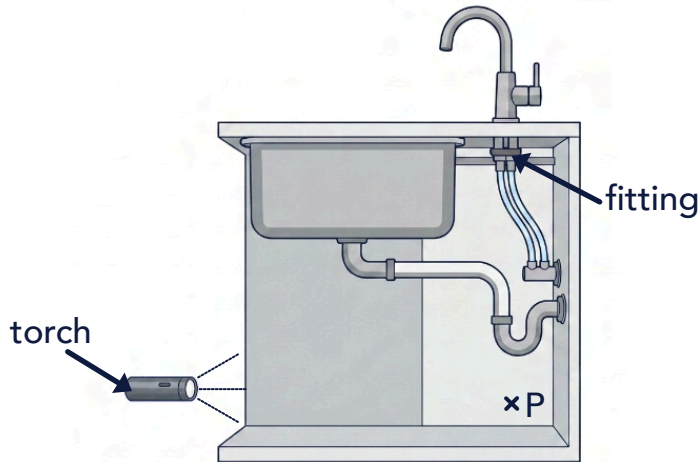
.....

[1]

/ 4

3.

A plumber was trying to view a fitting on a sink. They shine light from their torch in the position shown.



3.a

The plumber is not able to see the fitting.

Why is the plumber not able to see the fitting?

Tick **one** box.

Light can be split into many colours

Light travels in straight lines

Light travels through empty space

Light travels very fast

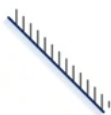
[1]

3.b

The plumber places a mirror at point P. This allows them to see the fitting.

Which image shows the angle that the plumber should place the mirror to see the fitting?

Tick **one** box.



[1]

3.c

What happens to the light when it hits the mirror that allows the plumber to see the fitting?

.....

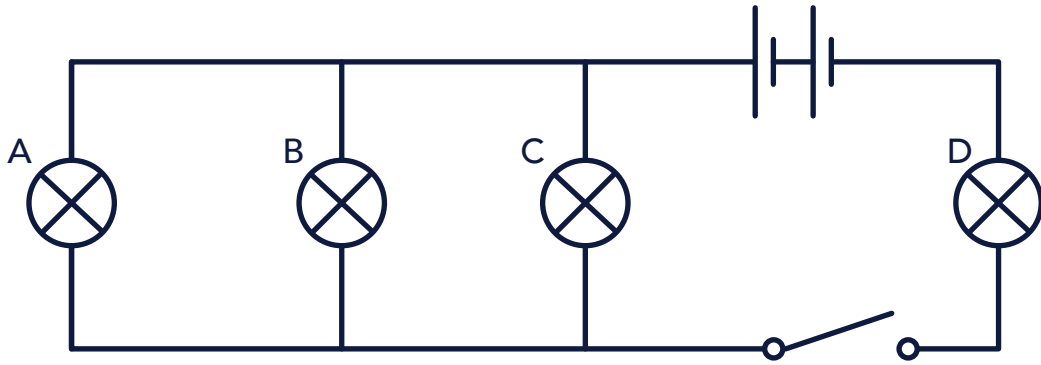
.....

[1]

/ 3

**Questions continue on next page**

4. A student builds the circuit shown below.



4.a Complete the sentences to describe the circuit.

Lamps A and B are connected in .....

The switch and lamp D are connected in ..... [2]

4.b Give the name of the component that is the energy source for the circuit.

..... [1]

4.c The student closed the switch and all of the lamps turned on. One of the lamps then broke and **all** of the lamps turned off.

Which lamp must have broken?

Tick **one** box.

A

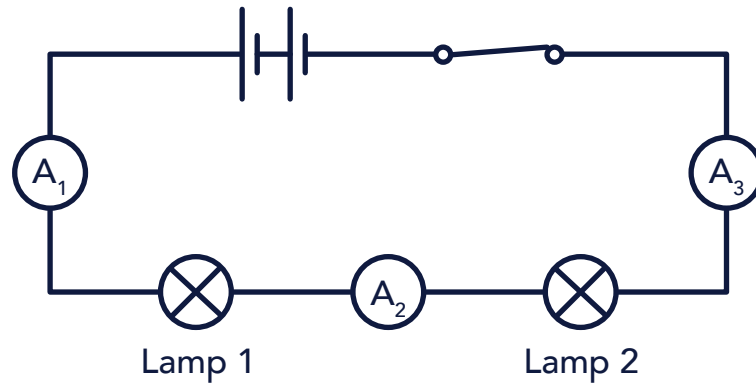
B

C

D

[1]

**4.d** The student builds another circuit, shown below.



When the switch is closed, both lamps are on.  
The student then opens the switch.

What happens to the lamps?

Tick **one** box.

Both lamps turn off

Lamp 1 stays on,  
lamp 2 turns off

Lamp 1 turns off,  
lamp 2 stays on

Both lamps stay on

[1]

**4.e** When the switch was closed, the reading on ammeter  $A_1$  was 0.5 A.

What are the expected readings on ammeters  $A_2$  and  $A_3$  when the switch is closed?

Tick **one** box.

$A_2$ reading (A)	$A_3$ reading (A)
0.25	0
0.25	0.25
0.5	0.5
1.0	1.5

[1]

**End of questions**