AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.4.2.3

Metabolism

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**2**
Available paper years	**2020–2021**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.4.2.3 Metabolism

Answer 01 · Mark scheme

November 2020 | 8464/B/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	amylase	allow phonetic spelling allow carbohydrase do **not** accept amylose	1	AO1 4.2.2.1
06.2	small intestine		1	AO1 4.2.1 4.2.2.1
06.3	any **one** from: • greater magnification • higher resolving power	allow can see (smaller) sub-cellular structures / parts allow can see more detail (inside cells) allow reference to 3-D images	1	AO1 4.1.1.5
06.4	capillary		1	AO2 4.2.2.1 4.2.2.2
06.5	$20 = \frac{\text{image length}}{0.8}$ image length = 0.8 x 20 image length = 16 (mm)		1 1 1	AO2 4.1.1.5 RPA 1
06.6	diffusion		1	AO3 4.1.3.1
06.7	active transport	allow active uptake	1	AO3 4.1.3.3

4.4.2.3 Metabolism

Answer 01 · Mark scheme

November 2020 | 8464/B/1F | Original Q6

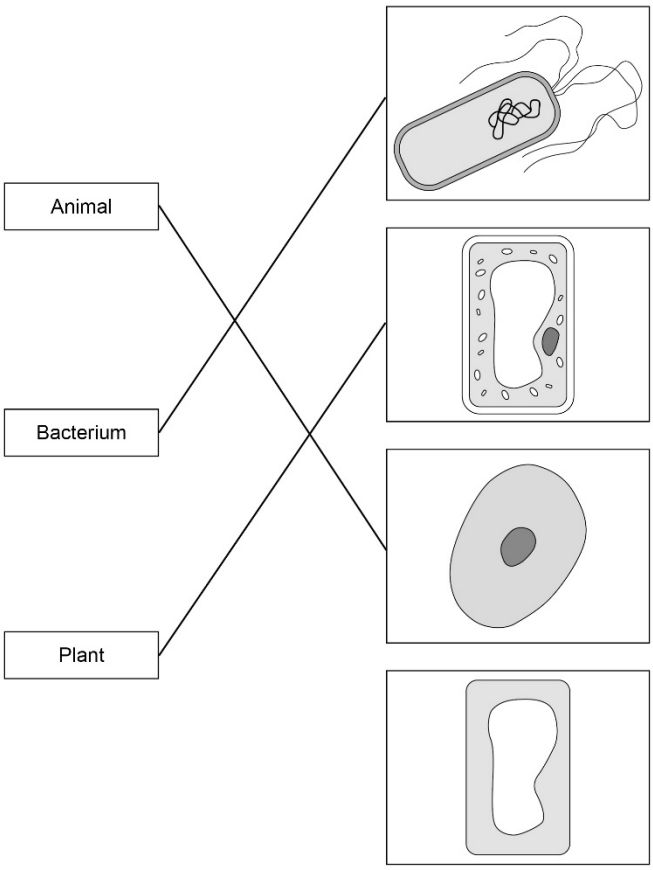
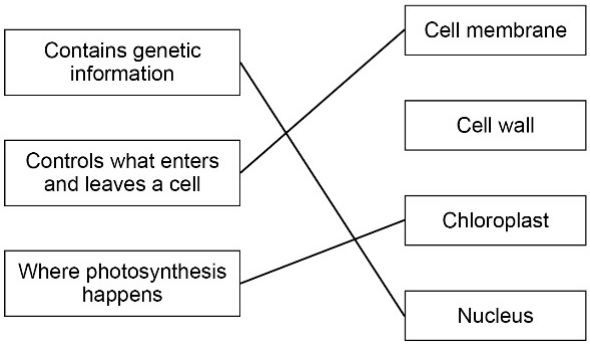
Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.8	any **one** from: • respiration • to form glycogen • to make amino acids / proteins	allow as an energy source do **not** accept to make / use / create / produce energy allow to make lipid / fat	1	AO1 4.4.2.1 4.4.2.3

06.9	**Level 2:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	3–4	AO2 4.1.1.3 4.1.3.1 4.1.3.3 4.2.2.1
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	
	No relevant content	0	
	Indicative content • have (many) microvilli • (to) increase surface area • wall of villus only one cell thick **or** is thin • capillaries are close to surface • (so) short pathway • good blood supply • (to) transport food molecules away **or** to the body • (and) maintain a diffusion gradient • cells have many mitochondria • (where) respiration takes place • (where) energy is transferred • (as) active transport requires energy • energy is needed to absorb sugar / food / molecules For Level 2 must make links between structure and it's function		

Total		**14**

4.4.2.3 Metabolism

Answer 02 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	 do **not** accept more than one line from a box on the left		1 1 1	AO1 4.1.1.1 4.1.1.2
01.2	 do **not** accept more than one line from a box on the left		1 1 1	AO1 4.1.1.2 4.1.2.1 4.1.3.1 4.4.1.1

4.4.2.3 Metabolism

01.3	urea glycogen starch cellulose	must be in this order	1 1 1 1	AO1 4.1.1.2 4.4.1.3 4.4.2.3
01.4	any **one** from: • (to cause) movement • to contract / shorten	 allow example of movement ignore to relax / expand ignore references to strength / energy / power	1	AO1 4.1.1.3 4.4.2.2
01.5	(many) mitochondria to transfer / release (a lot of) energy	 allow (mitochondria) for respiration do **not** accept to produce / make / create energy ignore reference to the shape / strength of the cells	1 1	AO2 4.1.1.2 4.1.1.3 4.4.2.1
01.6	$\frac{2}{0.05}$ (×) 40	 do **not** accept if a unit is given	1 1	AO2 4.1.1.5 RPA 1
Total			**15**	

4.4.2.3 Metabolism

Answer 02 · Mark scheme

November 2021 | 8464/B/1F | Original Q1

Answer 02 · Examiner comments

November 2021 | 8464/B/1F | Original Q1

Question 1 (low & standard demand)

This question was about cells and cell structure. More than half of the students identified the drawings of animal, bacterial and plant cells. Most students could identify the drawing of a bacterial cell. Knowledge of the function of cell structures was variable, but most students knew that the nucleus contains genetic information and many knew that photosynthesis happens in chloroplasts. There was some confusion between the function of the cell membrane and cell wall.

01.3 was about chemicals in cells. Most students knew that cellulose strengthens plant cell walls and many knew that urea is excreted by animals and starch is stored in plant cells. Knowledge of glycogen was set at a higher demand, and few knew that it is stored in animal cells.

In **01.4**, many thought the function of a muscle cell is for strength, which was ignored. A reference to movement or contraction was needed. Approximately a quarter of students scored a mark for saying that muscle cells have many mitochondria, but a weak expression of language in reference to energy meant that very few students gained both marks for **01.5**. Energy being produced, made or created is never credited and students should be encouraged to say that energy is transferred.

Over half of the students gained both marks for calculating the correct magnification. If units were added to the answer this prevented students gaining one mark. Common mistakes included incorrectly substituting into the equation, or multiplying their answer by a factor of 10.