AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.1.1.1

Eukaryotes and prokaryotes

Past-paper questions

Tier	**Foundation**
Question groups	**5**
Available paper years	**2018–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.1.1.1 Eukaryotes and prokaryotes

Question 01

June 2018 | 8464/B/1F | Original Q6

0 6 This question is about cell structures.

0 6 . 1 Draw **one** line from each cell structure to the type of cell where the structure is found.

[2 marks]

Cell Structure	Type of cell where the structure is found
Nucleus	Prokaryotic cells
Permanent vacuole	Plant cells only
Plasmid	Eukaryotic cells

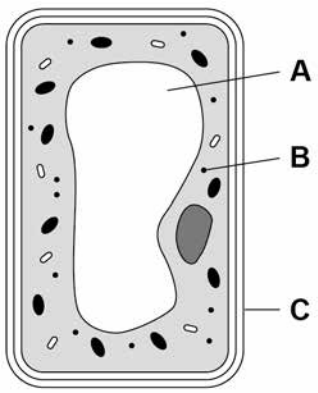
Question 6 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 01 · continued

0 6 . 2 **Figure 11** shows a plant cell.

Figure 11



What are the names of structures **A**, **B** and **C**?

[1 mark]

Tick **one** box.

Structure A	Structure B	Structure C	
Chloroplast	Vacuole	Cell wall	☐
Nucleus	Chloroplast	Cell membrane	☐
Vacuole	Mitochondrion	Cell membrane	☐
Vacuole	Ribosome	Cell wall	☐

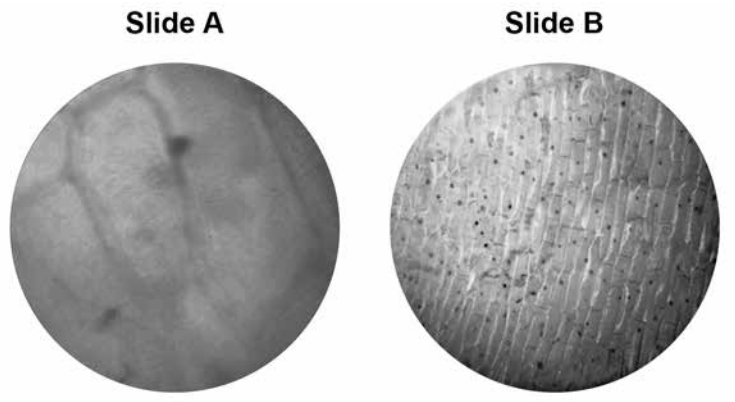
4.1.1.1 Eukaryotes and prokaryotes

Question 01 · continued

A student observed slides of onion cells using a microscope.

Figure 12 shows two of the slides the student observed.

Figure 12



The cells on the slides are **not** clear to see.

0 6 . 3 Describe how the student should adjust the microscope to see the cells on **Slide A** more clearly.

[1 mark]

0 6 . 4 Describe how the student should adjust the microscope to see the cells on **Slide B** more clearly.

[2 marks]

Question 6 continues on the next page

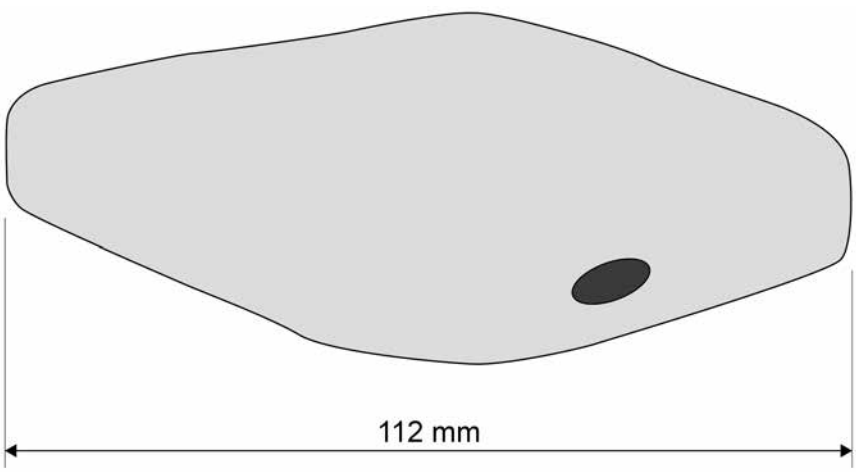
4.1.1.1 Eukaryotes and prokaryotes

Question 01 · continued

0 6 . 5 The student made the necessary adjustments to get a clear image.

Figure 13 shows the student's drawing of one of the cells.

Figure 13



The real length of the cell was 280 micrometres (µm).

Calculate the magnification of the drawing.

[3 marks]

Magnification = × _____

9

4.1.1.1 Eukaryotes and prokaryotes

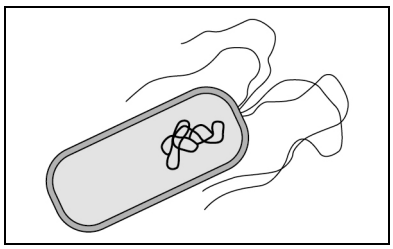
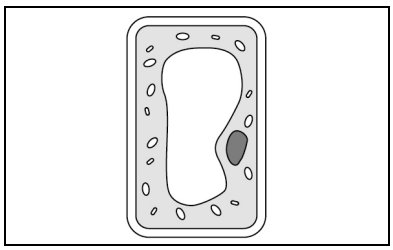
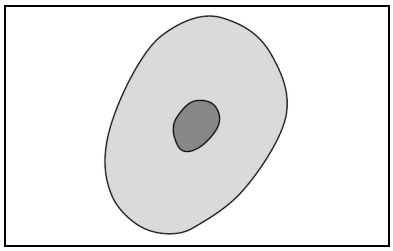
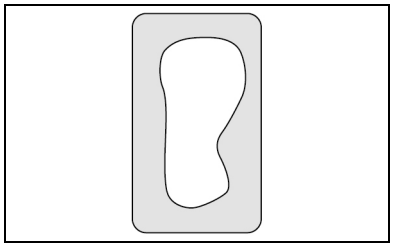
Question 02

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

0 1 Cells are the building blocks of life.

0 1 . 1 Draw **one** line from each type of organism to the diagram of one of its cells.

[3 marks]

Type of organism	Diagram of one cell
Animal	
Bacterium	
Plant	
	

4.1.1.1 Eukaryotes and prokaryotes

0 1 . 2 Cells contain structures. These structures have different functions.

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

[3 marks]

Function	Structure
	Cell membrane
Contains genetic information	
	Cell wall
Controls what enters and leaves a cell	
	Chloroplast
Where photosynthesis happens	
	Nucleus

Question 1 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

0 1 . 3 Chemicals are produced in cells.

Complete the sentences.

Choose answers from the box.

[4 marks]

cellulose	**DNA**	**glycogen**	**starch**	**urea**

A chemical excreted by animals is _____ .

A chemical stored in animal cells is _____ .

A chemical stored in plant cells is _____ .

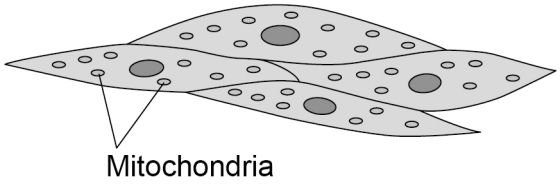
A chemical that strengthens plant cell walls is _____ .

4.1.1.1 Eukaryotes and prokaryotes

Question 02 · continued

Figure 1 shows a diagram of muscle cells.

Figure 1



0 1 . 4 Give **one** function of muscle cells.

[1 mark]

0 1 . 5 Explain how muscle cells are adapted for their function.

Use **Figure 1**.

[2 marks]

Question 1 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 02 · continued

0 1 . 6 One muscle cell was 0.05 mm wide.

When viewed using a microscope the image of the muscle cell was 2 mm wide.

Calculate the magnification used to view the cell.

Use the equation:

$$\text{magnification} = \frac{\text{width of image}}{\text{width of real cell}}$$

[2 marks]

Magnification = × _____

15

4.1.1.1 Eukaryotes and prokaryotes

Question 03

June 2022 | 8464/B/1F | Original Q5

0 5 Bacteria can cause a variety of diseases in humans.

0 5 . 1 What are **two** similarities between a bacterial cell and an animal cell?

[2 marks]

Tick (✓) **two** boxes.

- Both have a cell membrane. ☐
- Both have a cell wall. ☐
- Both have a nucleus. ☐
- Both have cytoplasm. ☐
- Both have plasmids. ☐

0 5 . 2 Salmonella food poisoning is caused by bacteria in food.

Give **one** symptom of salmonella food poisoning.

Do **not** refer to vomiting or diarrhoea in your answer.

[1 mark]

_____

_____

Question 5 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 03 · continued

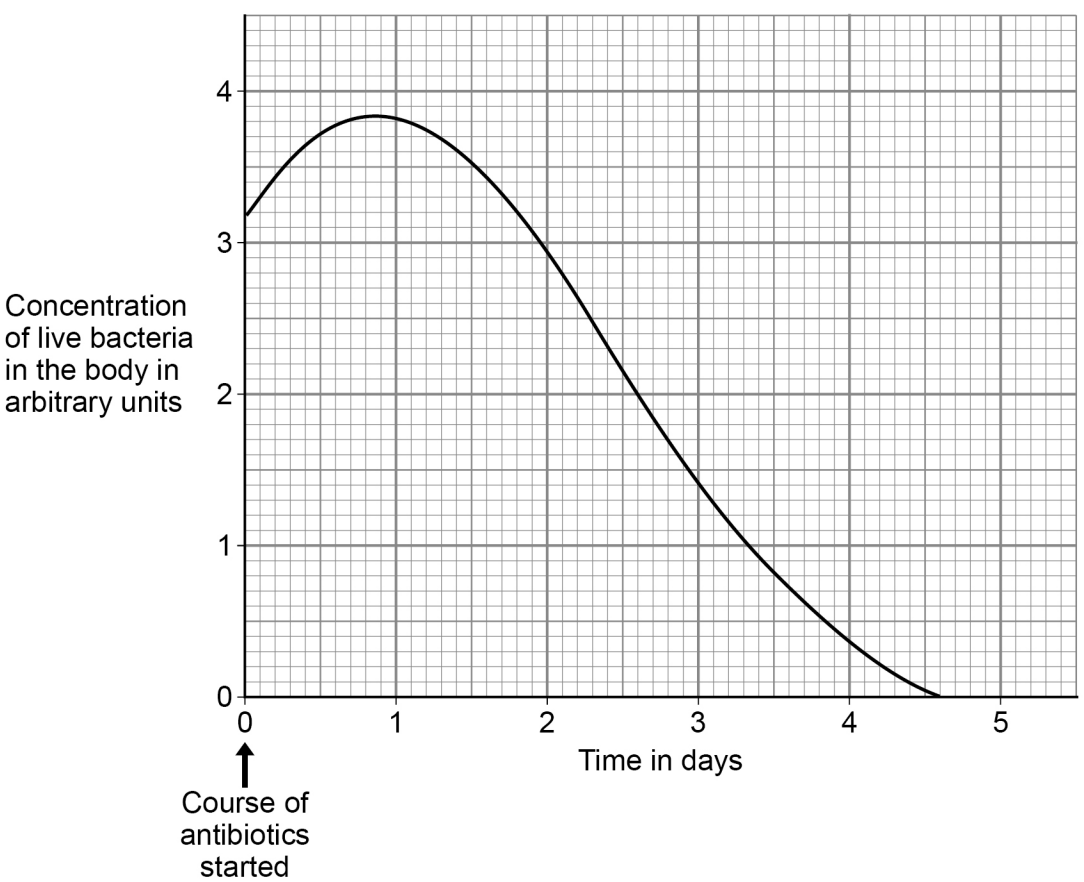
0 5 . 3 What is the name of the first antibiotic developed?

[1 mark]

A child with a severe bacterial infection was given a course of antibiotics.

Figure 7 shows how the concentration of live bacteria in the child's body changed when taking the course of antibiotics.

Figure 7



4.1.1.1 Eukaryotes and prokaryotes

Question 03 · continued

0 5 . 4 The concentration of live bacteria in the body continued to increase after starting the course of antibiotics.

Suggest **one** reason why.

[1 mark]

0 5 . 5 After 3 days of taking the antibiotic:

- the child felt better
- there were still bacteria in the child's body.

Why did the child feel better?

[1 mark]

Tick (✓) **one** box.

Bacteria had become immune to the antibiotic. ☐

The child had become resistant to the bacteria. ☐

There were fewer toxins in the body than at day 0 ☐

0 5 . 6 Suggest why doctors do **not** give antibiotics to patients with minor infections.

[1 mark]

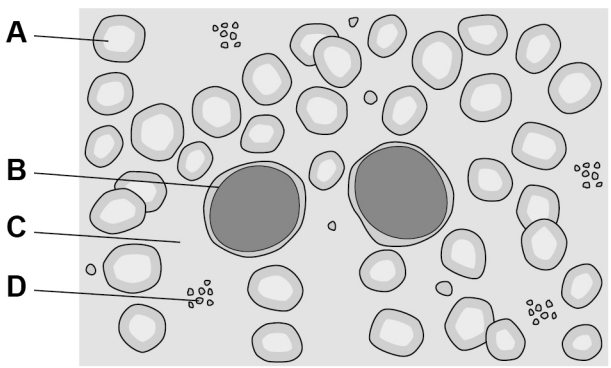
Question 5 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 03 · continued

Figure 8 shows blood viewed using a microscope.

Figure 8



0 5 . 7 A vaccine will stimulate the production of antibodies.

Which part of the blood in **Figure 8** produces antibodies?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 5 . 8 Which part of the blood in **Figure 8** starts the clotting process?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

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4.1.1.1 Eukaryotes and prokaryotes

Question 04

June 2024 | 8464/B/2F | Original Q6

0 6 Potatoes are a food crop.

0 6 . 1 Potato plants are classified as eukaryota.

What type of classification group is eukaryota?

[1 mark]

Tick (✓) **one** box.

- Class ☐
- Domain ☐
- Kingdom ☐
- Phylum ☐

0 6 . 2 Potato plants can reproduce by asexual reproduction.

Which statement is true for asexual reproduction?

[1 mark]

Tick (✓) **one** box.

- Meiosis occurs. ☐
- Offspring are genetically identical. ☐
- Pollen and egg cells are produced. ☐

Question 6 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 04 · continued

0 6 . 3 Flowers of potato plants contain gametes for sexual reproduction.

How is a gamete different from other cells in a potato plant?

[1 mark]

Tick (✓) **one** box.

A gamete contains one-quarter of the number of chromosomes. ☐

A gamete contains half of the number of chromosomes. ☐

A gamete contains double the number of chromosomes. ☐

0 6 . 4 Plants in the same genus as potatoes have been studied by scientists.

Describe **one** way a new plant species could be identified as being in the same genus as potatoes.

[1 mark]

4.1.1.1 Eukaryotes and prokaryotes

Question 04 · continued

0 6 . 5 Scientists have collected and stored seeds from species in the same genus as potatoes.

In the future, these seeds may be used for genetic modification of potato plants.

Genetically modified potato plants could help supply food to the human population as the climate changes.

Explain why genetic modification of crop plants may be important for the human population to survive climate change.

[6 marks]

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4.1.1.1 Eukaryotes and prokaryotes

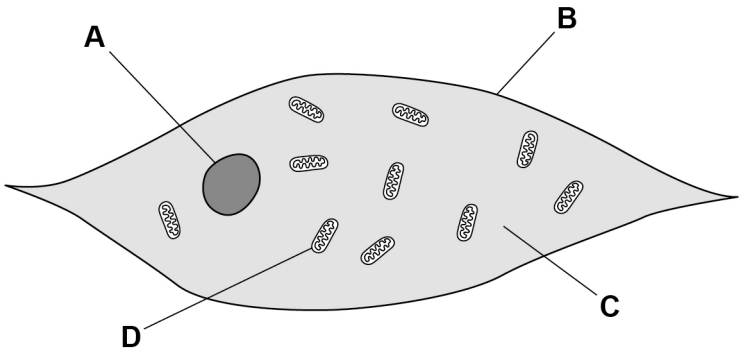
Question 05

June 2025 | 8464/B/1F | Original Q1

0 1 This question is about cells.

Figure 1 shows a muscle cell.

Figure 1



0 1 . 1 The nucleus and cytoplasm are parts of a muscle cell.

Draw **one** line from each part of the muscle cell to the correct label from **Figure 1**.

[2 marks]

Part of the muscle cell	Label from Figure 1
	A
Cytoplasm	B
Nucleus	C
	D

4.1.1.1 Eukaryotes and prokaryotes

Question 05 · continued

0 1 . 2 What is the function of the nucleus?

[1 mark]

0 1 . 3 What part of a cell controls the movement of substances into the cell?

[1 mark]

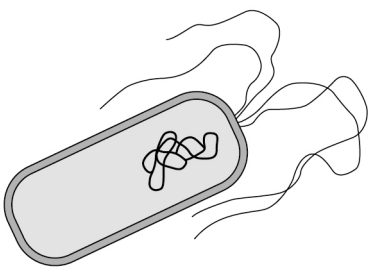
Question 1 continues on the next page

4.1.1.1 Eukaryotes and prokaryotes

Question 05 · continued

Figure 2 shows a bacterial cell.

Figure 2



0 1 . 4 What type of cell is the bacterial cell in **Figure 2**?

[1 mark]

Tick (✓) **one** box.

A fungal cell ☐

A prokaryotic cell ☐

A sperm cell ☐

0 1 . 5 Which are **two** features of bacterial cells?

[2 marks]

Tick (✓) **two** boxes.

Bacterial cells are larger than animal cells. ☐

Bacterial cells contain a loop of DNA. ☐

Bacterial cells contain a nucleus. ☐

Bacterial cells contain chloroplasts. ☐

Bacterial cells have a cell wall. ☐

4.1.1.1 Eukaryotes and prokaryotes

Question 05 · continued

Stem cells are cells that are **not** specialised.

Stem cells can be collected from human bone marrow.

0 1 . 6 What type of stem cells are found in bone marrow?

[1 mark]

Tick (✓) **one** box.

- Adult stem cells ☐
- Embryonic stem cells ☐
- Meristem cells ☐

0 1 . 7 Which process produces stem cells in humans?

[1 mark]

Tick (✓) **one** box.

- Digestion ☐
- Mitosis ☐
- Respiration ☐

Question 1 continues on the next page

Question 05 · continued

0 1 . 8 Stem cells can be used to produce blood cells.

A blood transfusion is when a patient is given blood cells.

Table 1 compares two different methods of providing blood cells that can be given to a patient.

Table 1

Blood cells produced from stem cells in a laboratory	Blood cells from a blood donation
• A small sample of blood is taken from a person. • All of the new blood cells can function for 120 days. • The stem cells from the blood sample can produce unlimited quantities of blood cells.	• 470 cm^3 of blood is collected from a person. • The cells can function for between 1 and 120 days.

A scientist stated:

'Blood cells produced from stem cells are better to use for a blood transfusion than blood cells from a donation.'

Suggest **two** reasons that support the scientist's statement.

[2 marks]

1 _____

_____

2 _____

_____

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