

GCSE Combined Science: Trilogy

Worksheet: Eukaryotes and prokaryotes

TIME 35 min	TOTAL 31 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Eukaryotes and prokaryotes

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

The length of a palisade cell is 0.08 mm.

The length of a bacterium is 2 μm .

0 1 . 1

Give the length of the palisade cell in micrometres (μm).

1 mm = 1000 μm

.....

.....

.....

Length = μm

[1 mark]

0 1 . 2

Calculate how many times larger the palisade cell is than the bacterium.

.....

.....

.....

.....

[1 mark]

0 2

The length of an onion epidermis cell is 0.3 mm.

The diameter of a yeast cell is 4 μm .

0 2 . 1

Give the length of the onion epidermis cell in micrometres (μm).

1 mm = 1000 μm

.....

.....

.....

Length = μm

[1 mark]

0 2 . 2

Calculate how many times larger the onion epidermis cell is than the yeast cell.

.....

.....

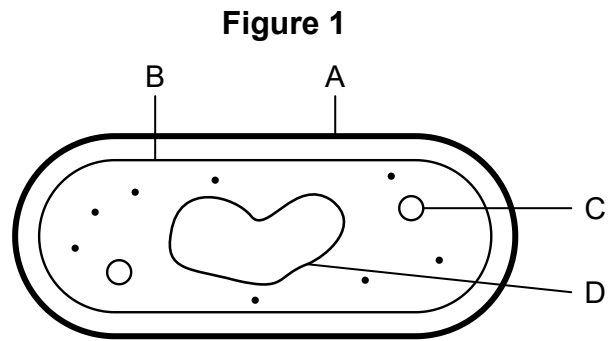
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.....

[1 mark]

0 3

Figure 1 shows a bacterial cell.



0 3 . 1

Name structures **A** and **B**.

.....

.....

.....

.....

[2 marks]

0 3 . 2

Structure **C** is a small ring of DNA.
Name structure **C**.

.....

.....

.....

.....
[1 mark]

0 3 . 3

Give **one** piece of evidence from Figure 1 that this is a prokaryotic cell.

.....

.....

[1 mark]

0 3 . 4

The bacterial cell in Figure 1 is 3 μm long.
What is the most likely length of a plant leaf cell?
Tick (✓) **one** box.

0.05 μm

☐

0.5 μm

☐

50 μm

☐

5 mm

☐

[1 mark]

0 3 . 5

Which structure is found in this bacterial cell and in a plant cell, but **not** in an animal cell?

Tick (✓) **one** box.

Cell membrane

☐

Cell wall

☐

Cytoplasm

☐

Plasmid

☐

[1 mark]

0 4

Table 1 compares the structures found in three types of cell.
A tick (✓) means that the structure is present. A cross (X) means that the structure is absent.

Table 1

Structure	Bacterial cell	Plant leaf cell	Human cheek cell
Cell membrane	✓	✓	✓
Cell wall			
Nucleus			
Chloroplasts			
Plasmids			

0 4 . 1

Complete Table 1.
Write a tick (✓) or a cross (X) in each empty box.

.....

.....

.....

.....

.....

.....

.....

[4 marks]

0 4 . 2

Give **one** structure, other than the cell membrane, that is found in all three types of cell.

.....

.....

[1 mark]

0 4 . 3

Use your completed Table 1 to explain why the human cheek cell is described as a eukaryotic cell.

.....

.....

[1 mark]

0 5

The diameter of a human cheek cell is 0.05 mm.
The length of a bacterium is 2.5 μm .

0 5 . 1

Give the diameter of the human cheek cell in micrometres (μm).
1 mm = 1000 μm

.....

.....

.....

Diameter = μm

[1 mark]

0 5 . 2

Calculate how many times larger the human cheek cell is than the bacterium.

.....

.....

.....

.....

[1 mark]

0 6

Table 2 shows the lengths of three cells.

Table 2

Cell	Length
Bacterium	1.2 μm
Human cheek cell	60 μm
Human egg cell	0.12 mm

0 6 . 1

Convert the length of the human egg cell into micrometres (μm).
1 mm = 1000 μm

.....

.....

.....

Length = μm

[1 mark]

0 6 . 2

How many times longer is the human egg cell than the bacterium?

.....

.....

.....

.....

[1 mark]

0 6 . 3

By how many orders of magnitude is the egg cell larger than the bacterium?

.....

.....

.....

.....

[1 mark]

0 6 . 4

Give the length of the bacterium in metres.
Give your answer in standard form.

.....

.....

.....

Length = m

[1 mark]

0 6 . 5

Give **two** structures found in the bacterium that are **not** found in the human egg cell.

.....

.....

.....

.....

[2 marks]

.....

0 7

A scientist used an electron microscope to look at three different single-celled organisms, **A**, **B** and **C**.

Table 3 shows the results.

Table 3

Structure	Organism A	Organism B	Organism C
Cell membrane	✓	✓	✓
Cell wall	✓	✓	X
Nucleus	X	✓	✓
Mitochondria	X	✓	✓
Chloroplasts	X	✓	X
Plasmids	✓	X	X

0 7 . 1

Which organism, **A**, **B** or **C**, is a prokaryote?

Give **two** reasons for your answer.

.....

.....

.....

.....

.....

.....

[3 marks]

0 7 . 2

Organism **B** can photosynthesise.

Give the evidence from Table 3 that shows this.

.....

.....

[1 mark]

0 7 . 3

A student said that organism **C** is similar to an animal cell.
Give **one** piece of evidence from Table 3 that supports the student's idea.

.....

.....

[1 mark]

0 7 . 4

Suggest which organism, **A**, **B** or **C**, is the smallest.
Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Eukaryotes and prokaryotes · 31 marks

Question 1 (2 marks)

01.1 [1 mark]

Answer: 80 μm

- 80 (μm) (1)
-

01.2 [1 mark]

Answer: 40 times

- $(80 \div 2 =) 40$ (1)

Notes: Allow ECF from an incorrect conversion to μm .

Question 2 (2 marks)

02.1 [1 mark]

Answer: 300 μm

- 300 (μm) (1)
-

02.2 [1 mark]

Answer: 75 times

- $(300 \div 4 =) 75$ (1)

Notes: Allow ECF from an incorrect conversion to μm .

Question 3 (6 marks)

03.1 [2 marks]

Answer: A: cell wall; B: cell membrane

- A – cell wall (1)
- B – cell membrane (1)

Notes: Allow 'plasma membrane' or 'cell surface membrane' for B. Do not accept 'cell wall' for B.

03.2 [1 mark]

Answer: plasmid

- plasmid (1)
-

03.3 [1 mark]

- the genetic material / DNA (structure D) is not enclosed in a nucleus (1)

Notes: Allow 'it has plasmids' or 'the DNA is a single loop'. Ignore 'it has a cell wall'.

03.4 [1 mark]

Correct: 50 µm

03.5 [1 mark]

Correct: Cell wall

Question 4 (6 marks)

04.1 [4 marks]

Answer: cell wall ✓ ✓ X; nucleus X ✓ ✓; chloroplasts X ✓ X; plasmids ✓ X X

- cell wall: ✓ ✓ X (1)
- nucleus: X ✓ ✓ (1)
- chloroplasts: X ✓ X (1)
- plasmids: ✓ X X (1)

Notes: 1 mark for each completely correct row.

04.2 [1 mark]

- cytoplasm / ribosomes (1)

Notes: Allow DNA / genetic material. Do not accept nucleus, cell wall or mitochondria.

04.3 [1 mark]

- it has a nucleus / its genetic material is enclosed in a nucleus (1)
-

Question 5 (2 marks)

05.1 [1 mark]

Answer: 50 μm

- 50 (μm) (1)

05.2 [1 mark]

Answer: 20 times

- $(50 \div 2.5 =) 20$ (1)

Notes: Allow ECF from an incorrect conversion to μm .

Question 6 (6 marks)

06.1 [1 mark]

Answer: 120 μm

- 120 (μm) (1)

06.2 [1 mark]

Answer: 100 times

- 100 (1)

Notes: Allow ECF from an incorrect conversion above.

06.3 [1 mark]

Answer: 2 (a factor of 10^2)

- $2 / 10^2$ (1)

06.4 [1 mark]

Answer: $1.2 \times 10^{-6} \text{ m}$

- $1.2 \times 10^{-6} \text{ (m)}$ (1)

06.5 [2 marks]

- cell wall (1)
- plasmid(s) (1)
- a single (circular) loop of DNA (not enclosed in a nucleus) (1)

Any 2 of the points above.

Notes: Ignore flagellum. Do not accept cell membrane, cytoplasm or ribosomes.

Question 7 (7 marks)

07.1 [3 marks]

Answer: A

- A (1)
- no nucleus / genetic material not enclosed in a nucleus (1)
- has plasmids / has no mitochondria (1)

Notes: The reason marks can only be awarded if A is chosen.

07.2 [1 mark]

- (organism B) has chloroplasts (1)

07.3 [1 mark]

- C has no cell wall (1)

Notes: Allow 'C has no chloroplasts'. Do not accept 'has a nucleus' or 'has mitochondria' alone.

07.4 [2 marks]

- A (1)
 - prokaryotic / bacterial cells are much smaller than eukaryotic cells (1)
-