AQA GCSE Biology | 8461

SPECIFICATION POINT 4.1.1.1

# Eukaryotes and prokaryotes

## Mark schemes and examiner comments

| | |
|---|---|
| Tier | **Foundation** |
| Question groups | **3** |
| Available paper years | **2010–2023** |

## 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.

4.1.1.1 Eukaryotes and prokaryotes

Answer 01 · Mark scheme

June 2010 | BLY3F | Original Q7 | Legacy

## Question 7

| question | answers | extra information | mark |
|---|---|---|---|
| **7**(a)(i) | A = (cell) wall<br><br>B = cytoplasm | ignore cellulose | 1<br><br>1 |
| **7**(a)(ii) | any **one** from<br>• bacterial cell / it has no nucleus<br>• DNA free in cytoplasm<br>• has no vacuole / no vesicles | <br>accept has DNA instead of a nucleus but **not** just has DNA<br>allow no mitochondria<br>ignore size<br>ignore strands of DNA | 1 |
| **7**(b)(i) | yeast grows best / better / well **or** optimum temperature for yeast / more yeast present<br><br>$CO_2$ made(by yeast)<br>**or** respires / respiration (by yeast) | allow yeast works best / better / well<br><br><br>allow fermentation (ignore anaerobic/aerobic) | 1<br><br>1 |
| **7**(b)(ii) | bacterium grows best / better / well / more bacteria present<br>**or** optimum temperature for bacterium<br><br>(lactic) acid made (by bacterium) | ignore micro organism / microbes<br>allow works / respires best / better / well (ignore anaerobic/aerobic)<br><br>do **not** allow wrong acid | 1<br><br>1 |
| **7**(b)(iii) | bread still rises (in acid conditions)<br>**or**<br>no need to control / monitor pH | | 1 |
| **Total** | | | **8** |

### 4.1.1.1 Eukaryotes and prokaryotes

**Answer 01 · Mark scheme**

June 2010 | BLY3F | Original Q7 | Legacy

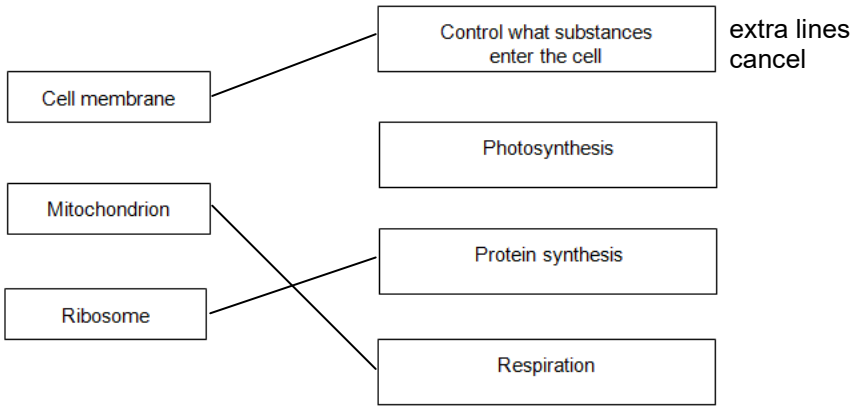
**BLY 3F**

### 4.1.1.1 Eukaryotes and prokaryotes

**Answer 02 · Mark scheme**



## Question 1

| question | answers | extra information | mark |
|---|---|---|---|
| 1(a)(i) | A = cytoplasm<br>B = (cell) membrane | | 1<br>1 |
| 1(a)(ii) | nucleus | accept chromosome / DNA / genes<br>accept phonetic. | 1 |
| 1(b) |  | extra lines cancel | 3 |
| **Total** | | | **6** |

4.1.1.1 Eukaryotes and prokaryotes

Answer 03 · Mark scheme

June 2023 | 8461/1F | Original Q4

## Question 4

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.1** | vector | | 1 | AO1<br>4.3.1.5 |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.2** | any **two** from:<br>• (it has) mitochondria<br>• (it has a) nucleus<br>• (it has) no plasmids | if neither mark awarded, allow **1** mark for protist has membrane-bound structures<br>allow it does not have a loop of DNA<br>allow other appropriate features<br>do **not** accept (it has) cytoplasm<br>do **not** accept (it has) a (cell) membrane<br>do **not** accept it has no cell wall | 2 | AO2<br>4.3.1.5<br>4.1.1.1 |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.3** | Salmonella | | 1 | AO2<br>4.1.1.1<br>4.3.1.3 |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.4** | only one parent is involved | | 1 | AO1<br>4.3.1.5<br>4.6.1.1 |

4.1.1.1 Eukaryotes and prokaryotes

Answer 03 · Mark scheme



| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.5** | 14 | | 1 | AO2<br>4.3.1.5<br>4.1.2.2 |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.6** | decreased haemoglobin | | 1 | AO2<br>4.3.1.5<br>4.2.2.3 |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.7** | | allow alternative route<br>allow correct conversion to standard form at any stage | | AO2<br>4.3.1.5 |
| | $\frac{210\ 000\ 000}{2}$<br>**or**<br>105 000 000 | allow $\frac{210 \text{ million}}{2}$<br>**or**<br>105 million | 1 | |
| | 105 000 000 × 3 | allow 105 million × 3 | 1 | |
| | 315 000 000 | allow 315 million | 1 | |
| | $3.15 \times 10^8$ | | 1 | |

### 4.1.1.1 Eukaryotes and prokaryotes



| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.8** | | ignore vaccination / anti-malarial drugs | | AO2<br>4.3.1.5 |
| | any **two** from: | | 2 | |
| | • wear long(er) sleeves / clothes | allow reduce bare skin exposure | | |
| | • use insect repellent or insecticides | allow insect repellent methods such as citronella candles | | |
| | • don't go out in the evening | allow close doors / windows in the evening | | |
| | • avoid going to countries / places with malaria / mosquitos | | | |
| | • destroy breeding grounds | allow methods of destroying breeding grounds such as drain water holes | | |
| | • release sterile male mosquitos | | | |
| | | allow other correct suggestions | | |

| Question | Answers | Extra information | Mark | AO / Spec Ref. |
|---|---|---|---|---|
| **04.9** | percentage / chance (of getting malaria) decreases (with age) | do **not** accept percentage / chance of having disorder **S** decreases with age | 1 | AO3<br>4.2.2.5<br>4.3.1.5 |
| | correct use of data such as two pairs of data from **Table 4** | | 1 | |
| | | allow use of processed data | | |

| **Total Question 4** | **15** |
|---|---|

4.1.1.1 Eukaryotes and prokaryotes

Answer 03 · Examiner comments

June 2023 | 8461/1F | Original Q4

**Question 4 (Low and standard demand)**

**04.1** Nearly two thirds of students knew the term 'vector' correctly describes the mosquito.

**04.2** Although the question states that Figure 2 showed a (single) cell of a malarial protist, some students remained confused and believed that there were 'cells depicted within a cell'. Others incorrectly discussed the absence of plant cell features, such as 'no chloroplasts', while others got prokaryotic and eukaryotic cells muddled. Reference to size was ignored. While 25% of students failed to gain any marks, the most frequently seen correct feature was 'nucleus', followed by 'mitochondria'. Phonetic spellings were obviously allowed as students have difficulty in spelling both of these words. As in all questions of this nature, the 'list rule' applied so that where a student gave 3 answers, 2 of which were correct and 1 wrong, only one mark could be given.

**04.3** Over two thirds of students gained the mark by selecting *Salmonella* to be prokaryotic. While the remaining students indicated 'cow' or 'grass', in equal amounts.

**04.4** Around 77% of students knew that asexual reproduction involved only one parent.

**04.5** It is clear that many students still remain unclear about the number of chromosomes involved in mitosis. Only around a third of students correctly selected '14' as the number of chromosomes each new protist cell would have after mitosis. The most common incorrect answer seen was '28', which was selected by a further third of the students.

**04.6** Around half of students were correct in selecting 'decreased haemoglobin' as a change that would happen in the blood of a person with malaria.

**04.7** Nearly 35% of students who are adept at mathematics found this question very straightforward and an easy route to four marks. A further 31% managed three marks, via many routes, but most commonly by reaching the point of 350 million but then failing to convert to standard form or incorrectly doing so. Others forgot that the question referred to 'millions' of people being infected and used 105 and 315 but, nevertheless, an answer of $3.15 \times 10^2$ was still awarded three marks.

**04.8** Many students were aware of what should be done to reduce the chance of being bitten by mosquitoes but then used inadequate scientific language to express themselves and as such only around 13% of students gained both available marks. Answers such as 'cover yourself up' or 'use bug spray / repellent' were not credited. 'Wear more / thicker clothes' was also deemed insufficient and 'close windows / doors' also failed to get credit without qualifying that this was only important in the evenings. Some correctly suggested not going to places with mosquitoes or where there was an incidence of malaria and a few answers referred to destruction of breeding grounds. Other correct suggestions were also awarded credit, but overall 42% of students scored zero marks.

**04.9** Nearly three quarters of students gained one mark here for correctly describing that the chance of getting malaria decreased with age. A few incorrectly understood the context of disorder S, however, and said that the likelihood of having this, rather than malaria, was lower as age increased. Even though the instruction given in the question was to use data

### 4.1.1.1 Eukaryotes and prokaryotes

**Answer 03 · Examiner comments** June 2023 | 8461/1F | Original Q4

from Table 4 only around 10% of students went on to gain the second mark for an appropriate use of figures. Some, unfortunately, glanced too quickly at the results and believed there was a decrease of 5% every 2 years.