



BIOLOGY MIND

# AQA

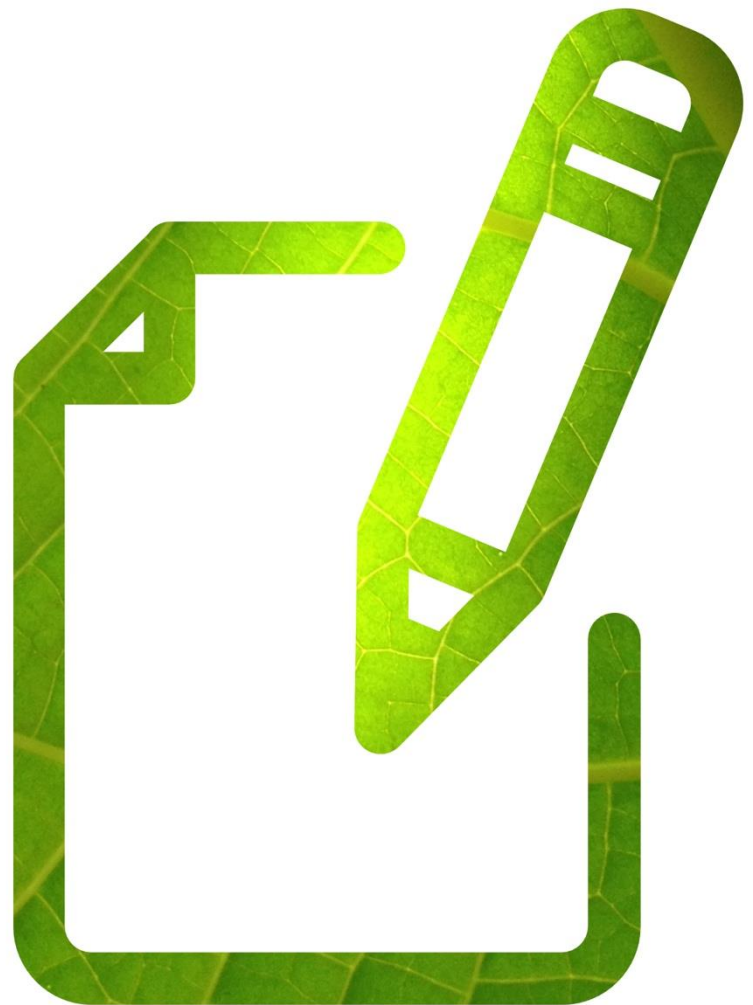
## GCSE

# BIOLOGY

4.1 | Cell Biology  
ANSWER PAPER 1

Difficulty  
MODERATE

Time allowed  
58 minutes



Score

/58

Percentage

%

1

(a) (i) chloroplast

1

(ii) cell wall

1

(b) (i) osmosis

*accept diffusion*

1

(ii) cell wall (prevents bursting)

1

(c) (i) carbon dioxide

*allow correct formula*

1

glucose

*allow sugar / starch*

1

(ii) any **two** from:

- light sensitive spot detects light
- tells flagellum to move towards light
- more light = more photosynthesis

2

(d) (cell has) larger SA:volume ratio

1

short (diffusion) distance

*allow correct description*

1



(diffusion) via cell membrane is sufficient / good enough

**or**

flow of water maintains concentration gradient

1  
[11]



- 2 (a) (i) xylem 1
- (ii) water 1
- minerals / ions / named example(s)  
*ignore nutrients* 1
- (b) (i) movement of (dissolved) sugar  
*allow additional substances, eg amino acids / correct named sugar (allow sucrose / glucose)*  
*allow nutrients / substances / food molecules if sufficiently qualified*  
*ignore food alone* 1
- (ii) sugars are made in the leaves 1
- so they need to be moved to other parts of the plant for respiration / growth / storage 1
- (c) (i) mitochondria 1
- (ii) for movement of minerals / ions  
*Do not accept 'water'* 1
- against their concentration gradient





- 3 (a) (i) nucleus 1
- (ii) diffusion 1
- (b) increases / larger surface area (for diffusion)  
*ignore large surface area to volume ratio* 1
- (c) (i) sugar / glucose  
*accept amino acids / other named monosaccharides* 1
- (ii) against a concentration gradient  
**or**  
from low to high concentration 1
- (iii) (active transport requires) energy 1
- (from) respiration 1
- (d) minerals / ions  
*accept named ion ignore nutrients*  
**do not accept water** 1

[8]



4 (a) contract / shorten

*ignore relax*  
*do **not** allow expand*

1

to churn / move / mix food

*accept peristalsis / mechanical digestion*  
*ignore movement unqualified*

1

(b) 400

*acceptable range 390-410*  
*allow 1 mark for answer in range of 39 to 41*  
*allow 1 mark for answer in range of 3900 to 4100*

2

(c) to transfer energy for use

*allow to release / give / supply / provide energy*  
*do **not** allow to 'make' /  produce' / 'create' energy*  
*allow to make ATP*  
*ignore to store energy*

1

by (aerobic) respiration **or** from glucose

*do **not** allow anaerobic*  
*energy released **for** respiration = max 1 mark*

1

(d) (i) to make protein / enzyme

*ignore 'antibody' or other named protein*

1

(ii) too small / very small

*allow light microscope does not have sufficient magnification*  
*/ resolution*



*allow ribosomes are smaller than mitochondria*  
*ignore not sensitive enough*  
*ignore ribosomes are transparent*

1

[8]





- 5 (a) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information in the [Marking guidance](#), and apply a 'best-fit' approach to the marking.

**0 marks**No relevant content.

**Level 1 (1-2 marks)**There is a brief description of at least one of the stages (pre-inoculation, inoculation, post-inoculation).

**Level 2 (3-4 marks)**There is a simple description of at least two stages and an explanation of at least one of them.

**Level 3 (5-6 marks)**There is a clear description of all three stages and an explanation of at least two of them.

### Examples of Biology points made in the response:

#### ***Pre-inoculation***

- Petri dish and agar sterilised before use
- to kill unwanted bacteria
- inoculating loop passed through flame / sterile swab
- to sterilise / kill (other) bacteria

#### ***Inoculation***

- loop/swab used to spread/streak bacterium onto agar

*Allow other correct methods, eg bacterial lawns*

- lid of Petri dish opened as little as possible
- to prevent microbes from air entering

#### ***Post-inoculation***

- sealed with tape
- to prevent microbes from air entering
- incubate



- to allow growth of bacteria

6

- (b) (i) bacteria killed / destroyed  
*ignore fights / attacks / stops growth / got rid of*

1

- (ii) *Might be correct*

largest area / space where no bacteria are growing  
*allow most bacteria killed*

1

*Might not be correct*

(need more evidence as) D may be harmful to people / animals / surfaces

*ignore ref to cost / dangerous or harmful unqualified*

1

**or** may work differently with different bacteria

**or** disinfectants may be different concentrations

*ignore different amounts of disinfectant unless reference to different drop size*

**or** may not last as long

*ignore take longer to work*

*allow reference to anomalous result or not repeated*

[9]



6 (a) any **two** from:

- only one 'chromosome'  
*allow one strand of DNA*
- circular  
*allow loop*
- may have plasmids
- not in a nucleus / no nucleus

2

(b) (i) any **one** from:

- London is much higher  
*or converse*
- more variable / wider range  
*allow 'on average it is 5 / 6 times greater'*

1

(ii) increases

*Included figures must be correct*

1

(iii) overall slight increase

*accept 'doesn't change much'*

1

variable / goes up and down

1

(c) (i) both axes correctly labelled

x = Year

y = Number of cases

1

correct points



*all correct = 2 marks*

*1-2 errors = 1 mark*

*> 2 errors = 0 marks*

2

suitable line of best fit

*accept straight line or smooth curve*

1

(ii) doesn't fit the pattern / line of best fit

1

(d) provides immunity / protection (to TB)

*ignore 'stops people catching it'*

*ignore 'resistance'*

1

prevents TB spreading

*accept ref to herd immunity*

1

[13]

