GCE

Biology A

H020/02: Depth in biology

AS Level

Mark Scheme for June 2023

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

© OCR 2023

MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training*; *OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor.
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 50% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. Work crossed out:

Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

Rubric Error Responses – Optional Questions
Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. (The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)

Multiple Choice Question Responses
When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).
When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. (The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)

Short Answer Questions (requiring a more developed response, worth two or more marks)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional

judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

7. There is a NR (No Response) option. Award NR (No Response)

   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
   - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

   If you have any questions or comments for your Team Leader, use the phone, the RM Assessor messaging system, or email.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.

In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

Level of response questions on this paper are **1(b)** and **3(b).**

11. Annotations available in RM Assessor

Marking Annotations

Annotation	Use
BOD	Benefit of Doubt
CON	Contradiction
	Cross
ECF	Error Carried Forward
GM	Given Mark
	Extendable horizontal wavy line (to indicate errors / incorrect science terminology)
I	Ignore
	Large dot (various uses as defined in mark scheme)
	Highlight (various uses as defined in mark scheme)
NBOD	Benefit of the doubt not given
	Tick
^	Omission Mark
BP	Blank Page
L1	Level 1 answer in Level of Response question
L2	Level 2 answer in Level of Response question
L3	Level 3 answer in Level of Response question

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
( )	Words which are not essential to gain credit
__	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

13. **Subject-specific Marking Instructions**

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

Question			Answer	Marks	AO element	Guidance
1	(a)	(i)	**FIRST CHECK ON ANSWER LINE** (SA:V cube is) 3:1 ✓✓	2	2.6	**ALLOW** one mark for: Surface area/SA (of cube): 2 x 2 = 4 , 4 x 6 = 24 Volume/V (of cube): 2 x 2 x 2 = 8 **OR** 24:8 ✓
		(ii)	*Any 2 from:* *Large/Multicellular plant/ It* **1** SA:V ratio is small(er) ✓ **2** diffusion, distance / pathway, long(er) ✓ **3** diffusion / gas exchange, (too) slow **OR** (named) assimilates/ nutrients / ions / gases, unable to reach inner cells (quickly enough) ✓ **4** metabolic/energy, demand is great(er) ✓	Max 2	1.2	**ALLOW ORA** for small plant throughout **4 ALLOW** metabolic demand is not met
	* (b)		Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** Full and detailed description of the structure and function of both sieve tubes **and** companion cells. Refers to labels as shown in Fig 1.2. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.*	6	1.2 x 3 2.5 x 3	**Indicative points can include:** *Function* **Sieve tube elements** -translocation - transport of, assimilates/ (organic) solutes/sucrose/amino acids. -tissue made up of sieve tube elements and companion cells. -allows mass flow / transport down a pressure gradient

Question			Answer	Marks	AO element	Guidance
			Level 2 (3–4 marks) A clear description of the structure **and** functions of phloem tissue. Some labels from Fig. 1.2 referred to. *There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.* **Level 1 (1–2 marks)** An account of some of the description of the structure **AND** function of phloem tissue **OR** A clear description of the structure **OR** function of phloem tissue. Limited reference to Fig. 1.2. *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** *No response or no response worthy of credit.*			-up and down plant / From source to sink/ bidirectional. -allows movement with less resistance. -(assimilates/AW used in) respiration / synthesis of (named) molecules. **Companion cells** -'life (non-structural) support' to sieve tube elements -gains sucrose from, mesophyll cell/source -(gains sucrose using) protons/ H^+ /energy/ active transport/active loading -allow / load, sucrose/ (organic) solutes (into sieve tube element) <u>*Structure*</u> **Sieve tube elements** – -living cells -long / hollow/ continuous, tubes -stacked end to end, to allow mass flow/ for less resistance/ to connect source to sink -no nucleus/little cytoplasm/few organelles -end walls are sieve plates -walls are, thin -(walls are) not lignified -sieve, plates /pores, to allow (named) solutes through/ limit size passing through -sieve pores linking cytoplasm of adjacent cells -sieve, pores/plates to reduce (rate of) flow **Companion cells** – -(dense) cytoplasm / (lots of) mitochondria -(large) nucleus. -plasmodesmata, (connecting to sieve tube elements).
			Total	**10**		

Question			Answer	Marks	AO element	Guidance
2	(a)	(i)	evaporation of water (molecules) / loss of water vapour/ water potential gradient (between leaf and atmosphere) / gaseous exchange (for photosynthesis) ✓	1	1.2	**IGNORE** ref to osmosis **ALLOW** water potential gradient described
		(ii)	*Any one from* temperature ✓ light intensity ✓	1	1.2	**ACCEPT soil** water content / (number of) stomata
	(b)	(i)	*Any three from:* **1** close dome off at bottom/ seal a clear plastic bag which can be tied (to stem of shoot) ✓ **2** testing, more/ lots of, humidities **OR** repeat more than x3 ✓ **3** group A cover leafy shoot (with a clear dome) ✓ **4** control, (room) temperature / light intensity ✓ **5** limit air movement ✓ **6** same area sprayed/even spray, each time ✓ **7** same/measure, volume (of water) in each spray ✓ **8** same, type of plant/size of leaves, used each time ✓ **9** check humidity level with, relative humidity meter / hygrometer **OR** use a humidifier ✓	Max 3	3.3	**IGNORE** ref to (all use same) apparatus as this is stated in the question**.** **1 ALLOW** ensure the, dome/bag is airtight **2 IGNORE** do more trials unqualified/ Group A use apparatus in Fig 2.2 **2 ALLOW** all groups should do all humidities. **3 ALLOW** Group A use a clear dome **6 ALLOW** distance the spray is used stays same **7 IGNORE** amount for 'volume' **8 ALLOW** same, stomatal density/ number of leaves/ surface area for 'same size leaves'
		(ii)	**FIRST CHECK THE ANSWER IN TABLE / ON ANSWER LINE.** mean = 31.7✓ rate of bubble movement = 10.6 ✓	2	2.8	**ALLOW** for 1 mark mean **and** rate given to >1 decimal place mean = 31.66(66) rate per minute group A = 10.55(56) **ECF** from incorrect mean **e.g**. 'Mean 31.6/ 3 = 10.5' = 1 mark

Question			Answer	Marks	AO element	Guidance
		(iii)	the greater the humidity, the lower the, (rate of) water uptake / transpiration ✓	1	3.2	**IGNORE** ref to movement/distance, of bubble
	(c)		**1** remove , plastic dome / cover / spray bottle✓ **2** place fan at different distances (from the apparatus) / fan, set to/with, different speeds (at same distance) ✓	2	3.3	**1 ALLOW** use a fan instead of, plastic dome/water spray/spraying the plant **1 ALLOW** ref to plastic bag for 'plastic dome' **1 ALLOW** diagram showing absence of dome/spray bottle **2 ALLOW** hair dryer set on cold for 'fan'. **2 ALLOW** fan placed at a set distance compared with no fan**.** **IGNORE** use fan to look at different air movement unqualified.
			Total	9		

Question			Answer	Marks	AO element	Guidance
3	(a)	(i)	add Biuret (instead of sodium hydroxide) ✓	1	3.4	**ALLOW** add copper sulphate (solution) **IGNORE** ref to changing temperature
		(ii)	OH^-✓ ***One*** *from* catalyses reactions ✓ determines/regulates, pH (of body fluids) ✓ neutralise acids (from stomach)✓ determining shape of proteins✓	Max 2	1.2	**IGNORE** hydroxide **DO NOT ALLOW** any additional ion **ALLOW** ecf for correct function related to an incorrect *anion* stated for mp1 **ALLOW** pH buffer **ALLOW** proton acceptor

Question	Answer	Marks	AO element	Guidance
*(b)	Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** Full and detailed description of the tests for both biological molecules correctly described, including reagents, some apparatus, and correct results in accordance with the table**.** *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Level 2 (3–4 marks)** A clear account of both tests for both biological molecules and correct results in accordance with the table **OR** a full and detailed description of one of the tests with limited account for the other. *There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.*	**6**	**1.2 x 3** **2.7 x 2** **3.2 x 1**	For highest band correct tests for both biological molecules are required. Reagents correctly named. Some apparatus mentioned **Indicative points can include:** <u>*Lipids*</u> **Apparatus** test tube/AW filter paper and funnel pipette **Emulsion test + Reagents** **- add** test solution to, **ethanol** / alcohol - mix with water. - can filter and add water to filtrate **Result.** (from clear/colourless to) cloudy/ milky (suspension) **OR** **Apparatus** test tube/AW pipette **Sudan lipid test + Reagents** add test solution to water. **add** few drops of **Sudan** III and mix **Result.** (from clear/colourless to) red layer (on top of solution)

Question	Answer	Marks	AO element	Guidance
	Level 1 (1–2 marks) A limited account of one of the tests for biological molecules with correct result. *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** *No response or no response worthy of credit.*			*<u>Starch</u>* **Apparatus** spotting tile/test tube pipette/dropping bottle **Iodine test + Reagents.** to test solution **add** a few drops **of Iodine/Iodide** solution **Result**. (from brown/orange to) blue-black/ dark blue/black/purple

Question			Answer	Marks	AO element	Guidance
	(c)	(i)	*Any three from:* **1** zero/calibrate, colorimeter with distilled water ✓ **2** add, 600nm/red, filter (to colorimeter) ✓ **3** place, samples/water, in a cuvette ✓ **4** use a range of known (glucose) concentrations ✓ **5** measure, percentage transmission / (light) absorption of, glucose solution(s)/sample(s)✓	**3**	**2.7 x1** **2.8 x1** **3.3 x1**	**ALLOW** test solution for glucose solution **1 DO NOT ALLOW** calorimeter for 'colorimeter' **1 ALLOW** reset for 'zero/calibrate' **1 IGNORE** restart for 'reset' **2 ALLOW** set colorimeter to, red/600nm
		(ii)	**FIRST CHECK ON ANSWER LINE** **If answer = 3.5 award 2 marks** 45% absorption on graph = 0.0035 (mmol cm^{-3}) ✓ x 1000 = 3.5 (mmol dm^{-3}) ✓	**2**	**2.8**	**ALLOW** range 3.4 to 3.6 (mmol dm^{-3}) for 2 marks. **ALLOW** evidence from graph for '45% absorption' **ALLOW** range of 0.0034-0.0036
			Total	**14**		

Question			Answer	Marks	AO element	Guidance
4	(a)		*Any two from:* **1** regulate, trade in /collection, of guano ✓ **2** penguins can, (now) breed / increase in number✓ **3** prevent trade in (live) penguins / penguin's skin and oils ✓ **4** raise awareness/educate (locals/governments) ✓	**2**	**2.1**	**IGNORE** ref to endangered status/listing species/ conserving area as this is not CITES **1 ALLOW** prevent humans from, collecting/ using guano
	(b)		 **1** Species, richness /evenness, is, greater/ higher in 2010 (compared to 1980)✓ *Species richness* **2** 3 species in 2010 compared to 2 in 1980 ✓ *Species evenness* **3** In 1980 98% of penguin pairs were one species (Adelie) **and** In 2010 only 57% of penguin pairs one species (Adelie) ✓	**3**	**2.2 x 1** **3.1 x 2**	**IGNORE** ref to years other than 1980 and 2010 **1 ALLOW** stronger for 'greater' **1 DO NOT ALLOW no** species richness in 1980 **2 ALLOW** (after 1980) a new species/Gentoo, has emerged **3 ALLOW** In 2010 Adelie have decreased and, Chinstrap/Gentoo, have increased (in number) so they are more even. e.g. Adele penguins are 220 in 2010 and Chinstrap are 800 so numbers are closer.
			Total	**5**		

Question			Answer	Marks	AO element	Guidance
5	(a)	(i)	**FIRST CHECK ON ANSWER LINE** **If answer = (-)5.6 award 2 marks** 171855 - 162193 = 9662 ✓ (9662 / 171855 x 100) = (-) 5.6 ✓	**2**	**2.6**	**ALLOW** for one mark correct answer (if no workings shown) that is not to 2 significant figures e.g. 6%/ 5.62%/ 5.622%
		(ii)	*Any four from:* *Student B is correct because* **1** vaccination is for, MMR / three diseases , but data only shows confirmed cases of measles✓ **2** cannot tell how effective the vaccination was for the other two diseases / could be effective for other 2 diseases ✓ **3** vaccination data is only given for part of 2013 and 2014 whereas measles data is given for the whole year ✓ **4** more vaccinations could have been given (in the other 9 months of 2013 and 2014) ✓ **5** no data on, number of children who were not vaccinated / % vaccinations relative to total population✓ **6** no data on whether children who had measles were, vaccinated/not vaccinated ✓ **7** no vaccination data for 2012 ✓ **8** measles data for 2012 is for England and Wales, measles data for 2013 and 2014 is for England only ✓ **9** only confirmed cases included / unreported cases not included ✓	**Max 4**	**3.2**	**IGNORE** any ref to, student A's statement/ data that should not be included e.g. Measles data for 2012 shouldn't be included **1 ALLOW** vaccinations are for measles, mumps and rubella. **5 ALLOW** 'the number of children born in 2014 might be less than in 2013' **8 ALLOW** no data for vaccinations in Wales

Question			Answer	Marks	AO element	Guidance
		(iii)	*Any three from:* *Incorrect because* **1** different, vaccines are given to different age groups ✓ **2** this vaccine is, changed/ different, from year to year ✓ **3** because the, virus/pathogen, mutates (regularly) ✓ **4** so antigens (on the surface of the virus) change ✓ **5** immune system may not, recognise it/ respond to it ✓ *Correct because* **6** vaccine is recommended to, pregnant/ >50 years old/ diabetic / asthma / AW (medically vulnerable) ✓	**Max 3**	**3.3**	**1 ALLOW** same flu vaccine not given to different ages **1 IGNORE** ref to dose of vaccine for 'different vaccines' **2 ALLOW** vaccine has to be up to date (with changing virus) / vaccine is newly produced/ vaccine is changed frequently **3 ALLOW** new strains of virus emerge **4 ALLOW** vaccine (must) contain new antigen **5 ALLOW** new antibodies need to be made/old antibodies no longer effective

Question			Answer	Marks	AO element	Guidance
		(iv)	*Any two from:* **1** mass vaccination (at start of epidemic) can prevent spread of, pathogen/disease (into the wider population) ✓ **2** herd immunity ✓ **3** minimises possibility of, another outbreak of the disease/ a variant spreading✓	**Max 2**	1.2	**ALLOW** immunised for 'vaccinated' throughout **1 ALLOW** if everyone vaccinated the disease cannot spread **e.g** 'if population immunised pathogen is killed before it can spread' = mp1 **IGNORE** 'if more people are immune' for 'mass vaccination'
	(b)	**(i)**	(named part of) Immune system attacks, cells/tissues, as it recognises them as, foreign/non self. ✓	**1**	**1.2**	**IGNORE** body attacks itself for 'immune system attacks' **ALLOW** have an abnormal immune response as body cells treated as foreign
		(ii)	*Any two from* fibrous ✓ insoluble ✓ (high) tensile strength ✓ resistant to stretching ✓	**Max 2**	**2.1**	**ALLOW** (high) mechanical strength
		(iii)	bone marrow ✓	**1**	**1.1**	**IGNORE** embryos
		(iv)	*Error 1:* perforins *Correction:* interleukins / cytokines ✓ *Error 2:* antigen-toxin *Correction:* antigen-antibodies (complex) ✓	**2**	**2.5**	

Question			Answer	Marks	AO element	Guidance
	(c)		*Any two from* **1** stem cells, differentiate/ specialise, into nerve cells ✓ **2** (these) can be added to replace (dopamine producing) nerve cells in the, substantia nigra/ brain ✓ **3** (so) dopamine levels will increase ✓ **4** would, stop it progressing / allow normal body movements ✓	**Max 2**	**1.1**	**2 ALLOW** they can be implanted into the, brain/substantia nigra **3 ALLOW** dopamine levels, go back to normal/ are restored **3 IGNORE** dopamine will become more active **4 IGNORE** regulate/improve, body movements **4 IGNORE** functions for 'movement' **4 ALLOW** regain control of body movements/ reverses the effects of Parkinsons
			Total	**19**		

6	(a)	(i)	*Mitosis/it* **1** produces many cells (for growth of fragment) ✓ **2** (daughter) cells are genetically identical (to parent starfish)✓	2	2.2	**1 ALLOW** cell number increases/ continually produces cells **1 IGNORE** cells multiply / cells reproduce/ cells divide unqualified. **2 ALLOW** (mitosis) produces clones that are genetically identical
		(ii)	*Any one from* growth ✓ repair / replacing lost arms ✓	Max 1	1.2	 **ALLOW** control of body plan **IGNORE** repair cells/ healing **ALLOW** replace, dead/damaged, cells
		(iii)	*Any three from* **1** crossing over **2** (crossing over in) prophase 1 ✓ **3** independent assortment of (homologous) chromosomes in metaphase 1 ✓ **4** independent assortment of (chromatids) in metaphase 2 ✓ **5** DNA/ gene / chromosome, mutation ✓	Max 3	2.2 x 1 2.5 x 2	**ALLOW** mp1-3 for any correct description of prophase 1 or metaphase1/2 **3 ALLOW** random for 'independent' **4 ALLOW** random for 'independent'
	(b)		***FIRST CHECK ON ANSWER LINE*** ***If answer = 86 award 2 marks*** *31 / 0.36 (= 86.11)* ✓ *86* ✓	2	2.6	**ALLOW** for 1 mark Correct answer (if no workings shown) to more than 2 significant figures.
			Total	8		

7	(a)		*Any two from* **F** tail / flagellum **AND** **R** (for) movement / swimming ✓ **F** (many) mitochondria **AND** **R** release / provide, energy/ATP, for, movement / swimming ✓ **F** acrosome **AND** **R** contains, hydrolytic/ digestive enzymes **OR** **R** (enzymes) allow sperm to penetrate ovum / to breakdown outer part of ovum ✓	**Max 2**	**2.5**	**Feature must match the role** **e.g.** sperm cell has flagellum and mitochondria that provide energy for the cell to move = 2 marks **IGNORE** break the egg membrane **ALLOW** sperm to fuse with the egg for 'sperm to penetrate ovum'
		(b)	*Any two from* **F** (many) chloroplasts **AND** **R** for, photosynthesis/ light absorption ✓ **F** cylindrical/ rectangular, shape **AND** **R** can be closely packed to form continuous layer ✓ **F** thin cell wall **AND** **R** (increase) diffusion of carbon dioxide / (greater) light penetration ✓ **F** Large vacuole **AND** **R** to maintain turgor pressure / push chloroplasts to edge **OR** **R** to store the, cell sap/ sugars made in photosynthesis ✓	**Max 2**	**2.5**	**Feature must match the role** **ALLOW R** shorter distance for, gas exchange / carbon dioxide **IGNORE** to keep cell rigid for 'maintain turgor pressure'
			Total	**4**		

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

Call us on

01223 553998

Alternatively, you can email us on

support@ocr.org.uk

For more information visit

ocr.org.uk/qualifications/resource-finder

ocr.org.uk

Twitter/ocrexams

/ocrexams

/company/ocr

/ocrexams

CAMBRIDGE
UNIVERSITY PRESS & ASSESSMENT

OCR is part of Cambridge University Press & Assessment, a department of the University of Cambridge.

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored. © OCR 2023 Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee. Registered in England. Registered office The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA.

Registered company number 3484466. OCR is an exempt charity.

OCR operates academic and vocational qualifications regulated by Ofqual, Qualifications Wales and CCEA as listed in their qualifications registers including A Levels, GCSEs, Cambridge Technicals and Cambridge Nationals.

OCR provides resources to help you deliver our qualifications. These resources do not represent any particular teaching method we expect you to use. We update our resources regularly and aim to make sure content is accurate but please check the OCR website so that you have the most up-to-date version. OCR cannot be held responsible for any errors or omissions in these resources.

Though we make every effort to check our resources, there may be contradictions between published support and the specification, so it is important that you always use information in the latest specification. We indicate any specification changes within the document itself, change the version number and provide a summary of the changes. If you do notice a discrepancy between the specification and a resource, please contact us.

Whether you already offer OCR qualifications, are new to OCR or are thinking about switching, you can request more information using our Expression of Interest form.

Please get in touch if you want to discuss the accessibility of resources we offer to support you in delivering our qualifications.