Qualification Accredited

OCR
Oxford Cambridge and RSA

AS LEVEL

Examiners' report

BIOLOGY A

H020

For first teaching in 2015

H020/02 Autumn 2020 series

Version 1

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

	Reports for the Autumn 2020 series will provide a broad commentary about candidate performance, with the aim for them to be useful future teaching tools. As an exception for this series they will not contain any questions from the question paper nor examples of candidate answers.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

Would you prefer a Word version?

Did you know that you can save this PDF as a Word file using Acrobat Professional?

Simply click on **File > Export to** and select **Microsoft Word**

(If you have opened this PDF in your browser you will need to save it first. Simply right click anywhere on the page and select **Save as . . .** to save the PDF. Then open the PDF in Acrobat Professional.)

If you do not have access to Acrobat Professional there are a number of **free** applications available that will also convert PDF to Word (search for PDF to Word converter).

© OCR 2020

Paper 2 series overview

A small self-selected cohort took this paper to improve their calculated grades produced during the Covid-19 pandemic in summer 2020. Candidates knowledge of cell biology, immunology and gas exchange exceeded their understanding of biochemistry and practical laboratory experiments. Some candidates coped well with a diverse selection of maths problems while others struggled with following through in a step-wise approach, with rounding and with dealing with very large numbers.

Candidates who did well on this paper generally did the following:	***Candidates who did less well on this paper generally did the following:***
• Used subject-specific terminology correctly • Listed relevant facts • Showed mathematical problem-solving ability • Focused answers on the question asked • Covered the full range of ideas required in the level of response questions	• Misapplied specialist vocabulary • Wrote vague or ambiguous descriptions • Showed lack of familiarity with basic mathematical conventions like rounding up or down • Did not tailor their answers to the question wording

© OCR 2020

Themes in candidate responses

The theme of mathematical skills ran through this paper (**Questions 1(c)(ii)**, **2(b)(i)**, **2(d)(i)** and **3(b)(i)**. Candidates maximised their chances of gaining marks by showing their working stages in a logical step-wise fashion.

	**OCR support**	The OCR website has an extensive range of worksheets to help candidates develop their mathematical skills: https://www.ocr.org.uk/subjects/science/maths-for-biology/index.aspx?id=biology-a-h020-h420-from-2015 In addition there is the Biology mathematical skills handbook which provides support with teaching mathematical skills and is available here: https://www.ocr.org.uk/Images/294471-biology-mathematical-skills-handbook.pdf.

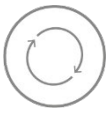
Comments on responses by question type

Level of response questions

The wording of the level of response questions required candidates to show a breadth of knowledge and the ability to organise their knowledge to address all the points required by the question. Level 3 answers require that the full extent of the question is addressed in detail.

In **Question 1(c)(iii)** candidates needed to relate structure to function (both aspects) in four types of cells. Partial answers achieved a lower level and mark, as did those that tried to address all of the required areas but made errors. The commonest errors were confusing erythrocytes and neutrophils, cilia and microvilli, and ciliated cells with goblet cells.

In **Question 6(b)** candidates needed to refer to structures shown on the insert figures for both fish and insect and relate these to both gas exchange and to ventilation. Again, partial answers achieved a lower level and mark as did those that contained factual errors. The commonest errors were omitting mention of ventilation mechanisms in fish and confusing the roles of tracheae, tracheoles and spiracles in insects. Candidates should be taught that air (not oxygen) enters spiracles and diffuses along tracheae and that in small resting insects, diffusion alone delivers a sufficient supply of oxygen to tissues.

	**AfL**	Candidates need to spend some time analysing the demands of a level of response question. A level of response question is likely to require them to address multiple aspects and may require a higher order skill such as linking or comparing of ideas. Careful analysis before starting to write an answer can identify how many areas need to be addressed, and how these areas should be linked. For example, **Question 1(c)(iii)** required that eight areas should be addressed, while **Question 6(b)** required six (structures on the insert identified with comment relevant to gas exchange and to ventilation for fish and again for insects). Candidates may benefit from drawing a table to show the number of areas required as empty boxes, which they can tick off when they have addressed each one.

© OCR 2020

?	**Misconception**	Many candidates misapplied the terms gas exchange and ventilation. Gas exchange covers the diffusion of oxygen and carbon dioxide at an exchange surface. Ventilation refers to muscular movements that result in the delivery of a fresh supply of air or water to an exchange surface. Ventilation may be tidal (as in mammals) or throughflow (as in fish).

Other

On structured questions candidates can judge how much and what to write by looking at the mark allocation. If the question requires reference to a figure or table, answers need to show evidence of having used the figure or table.

Question 4(a) provided a challenge as candidates needed to integrate two graphs and evaluate their findings in the light of a student statement that included a contradiction. A general exam technique tip is to use all the classes of data in the answer. In this question that would mean commenting on results from rest homes, schools, hospitals and other. A teaching tip is to show candidates examples of positive (direct) and negative (indirect) correlations on scattergraphs. Dose response curves illustrate that effective medical interventions produce a negative correlation when drug dose is plotted against disease incidence or prevalence or against mortality.

Common misconceptions

On **Question 1(c)** many candidates assumed that ciliated cells make mucus, despite the focus on separate goblet cells in **Question 2**.

On **Question 6(a)** some candidates calculated the volume and surface area of the cubes shown but expressed the ratio back to front, e.g. saying the surface area to volume ratio was 1 to 3 rather than 3 to 1.

Key teaching and learning points – comments on improving performance

On **Question 1** candidates varied in their knowledge of the features of a good biological drawing, but the main guidelines (title, scale, no shading, do not overlap label lines) are easily taught.

i	**OCR support**	The Biology Drawing skills handbook provides support with this: https://www.ocr.org.uk/Images/251799-biology-drawing-skills-handbook.pdf

On **Question 2** few candidates could draw a peptide bond and some candidates confused autoimmune disease with immune deficiency.

On **Question 3** few candidates knew the kingdoms to which the pathogens belonged and many seemed unfamiliar with the term agglutinin.

On **Question 4** the year's news coverage of the pandemic meant that most candidates introduced the term 'herd immunity' into their answer and used it correctly. Many also referred to the R number or R_0.

© OCR 2020

Numbers with decimal places below .5 should be rounded down (where necessary) and numbers with decimal places of .5 and above should be rounded up (where necessary). In the interests of accuracy intermediate stages of decimal working should not be rounded until the final answer stage.

Candidates should not be shy of using words in their working to explain the logic of each step, for example in **Question 2(d)(i)** headings could be 'finding 1.11% of the 2018 population', finding the 2019 population total', 'finding the number of lupus sufferers' and 'finding the proportion of sufferers that is photosensitive'.

Another good tip for candidates is to consider whether their final answer is bigger or smaller than they could reasonably expect. Taking this common sense view should help a candidate with a final answer to **Question 2(d)(i)** that exceeds the total population size to see that they must have made an error.

Guidance on using this paper as a mock

This paper provides excellent practice in solving maths problems and working out how to plan a full answer to a level of response question. The questions on microscopy (**Questions 1(a)** and **1(b)** and experimental design (**Question 3(b)(ii)** and **Question 5**) also provide a model for testing transferable skills. Doing the paper and going through the mark scheme could be followed up by applying the same questions and skills to new microscope drawings and descriptions of experiments.

© OCR 2020

Supporting you

Review of results

If any of your students' results are not as expected, you may wish to consider one of our review of results services. For full information about the options available visit the OCR website. If university places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications.

Supporting you through 2020-2021

Our priority is supporting you and your students this autumn and to support you as you prepare for summer 2021 exams. We'll update our website information regularly with resources, guidance and key information.

Take a look at our support for:

- Teachers
- Students
- Exams officers
- Assessment specialists

Keep up-to-date

We are sending a weekly roundup to tell you about important updates. You can also sign up for your subject specific updates. If you haven't already, sign up here.

OCR Professional Development

Attend one of our popular CPD courses to hear directly from a senior assessor or drop in to a Q&A session. All our courses for the academic year 2020-2021 are being delivered live via an online platform, so you can attend from any location.

Please find details for all our courses on the relevant subject page on our website or visit OCR professional development.

Signed up for Exambuilder?

ExamBuilder is the question builder platform for a range of our GCSE, A Level, Cambridge Nationals, Cambridge Technicals and Functional Skills qualifications. See the full list of available qualifications in the sign up form.

ExamBuilder is **free for all OCR centres** with an Interchange account and gives you unlimited users per centre. We need an Interchange username to validate the identity of your centre's first user account for ExamBuilder.

If you do not have an Interchange account please contact your centre administrator (usually the Exams Officer) to request a username, or nominate an existing Interchange user in your department.

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.

General qualifications
01223 553998
general.qualifications@ocr.org.uk

Vocational qualifications
02476 851509
vocational.qualifications@ocr.org.uk

For more information visit
ocr.org.uk/i-want-to/find-resources/
ocr.org.uk
/ocrexams
/ocrexams
/company/ocr
/ocrexams

We really value your feedback

Click to send us an autogenerated email about this resource. Add comments if you want to. Let us know how we can improve this resource or what else you need. Your email address will not be used or shared for any marketing purposes.

I like this **I dislike this**

Cambridge Assessment

OCR is part of Cambridge 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 2020 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.

You can copy and distribute this resource freely if you keep the OCR logo and this small print intact and you acknowledge OCR as the originator of the resource.

OCR acknowledges the use of the following content: N/A

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.