

OCR A LEVEL BIOLOGY



Summer Tasks

Staff Contacts

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Bridging the Gap GCSE to A Level Biology

In preparation for starting your A level in Biology please complete the following activities and bring all completed tasks to your first lesson in year 12.

If you have any questions or problems please contact Miss Jones.

What do you need to do before you start A level Biology	Name	Explanation	Description of resources
	"Water is an important biological molecule – Discuss"	We would like you to write a 500 word essay on the biological importance of water and attempt to include referencing. Be sure to site your sources.	Guide from OCR on how to reference resources and its importance. https://www.ocr.org.uk/Images/570838-guide-to-referencing.pdf
	Current Events	Select a current event, academic article or study and provide a detailed response including the following: 1. Synopsis of piece 2. Explanation of why you chose this piece 3. How this incorporates within your Biology course (or additional Science)	Be sure to site your sources. Examples can be found at: RSB Education Bioscience Journals Nobel School Online Library: https://uk.accessit.online/thn03/#!dashboard
	Exam Questions	Complete the exam questions provided using your knowledge of science from KS3 and KS4. Each question must be attempted, and all samples of writing must be done using correct grammar, punctuation and spelling.	Answer to the best of your ability and use extra lined paper if needed.
	Complete PAG 12.4	Research one organelle PAG. This will be your first assessed PAG task.	Please follow the instructions at the end of this document. Pay close attention to the marking criteria as this is what you will be assessed against. All information must be referenced following the referencing guide provided in the document.

A level Biology Transition Baseline Assessment

The following 2-part assessment is designed to test your recall, analysis and evaluative skills and knowledge.
Remember to use your exam technique: look at the command words and the number of marks each question is worth.

PART 1

1. a) What are the four base pairs found in DNA?

.....
(2)

- b) What does DNA code for?

.....
(1)

- c) Which organelle in a cell carries out this function?

.....
(1)

2. a) What theory did Charles Darwin propose?

.....
(1)

- b) Why did many people not believe Darwin at the time?

.....
(1)

- c) Describe how fossils are formed.

.....
(3)

- d) The fossil record shows us that there have been some species that have formed and some that have become extinct.

- i) What is meant by the term 'species'?

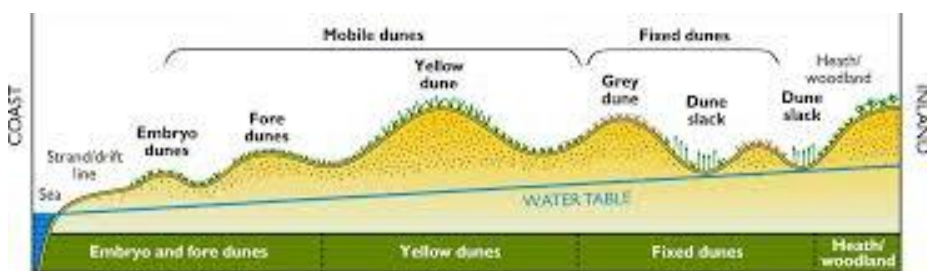
.....
(2)

- ii) Describe how a new species may arise:

.....
(3)

3. Ecologists regularly study habitats to measure the species present and the effect of any changes.

One team of ecologists investigated the habitat shown in the picture below:



a) Define the following keywords:

i) Population

.....

ii) Community

.....

(2)

b) Give an example of one biotic factor and one abiotic factor that would be present in this habitat

Biotic:

Abiotic:

(2)

c) Describe how the ecologists would go about measuring the species present between the coast and the inland.

.....

.....

.....

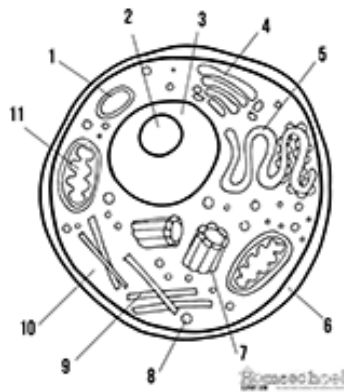
.....

.....

.....

(6)

4. Every living organism is made of cells.



a) Label the following parts of the

animal cell:

2

5

8

(3)

b) Describe how is the structure of the cell membrane related to its function?

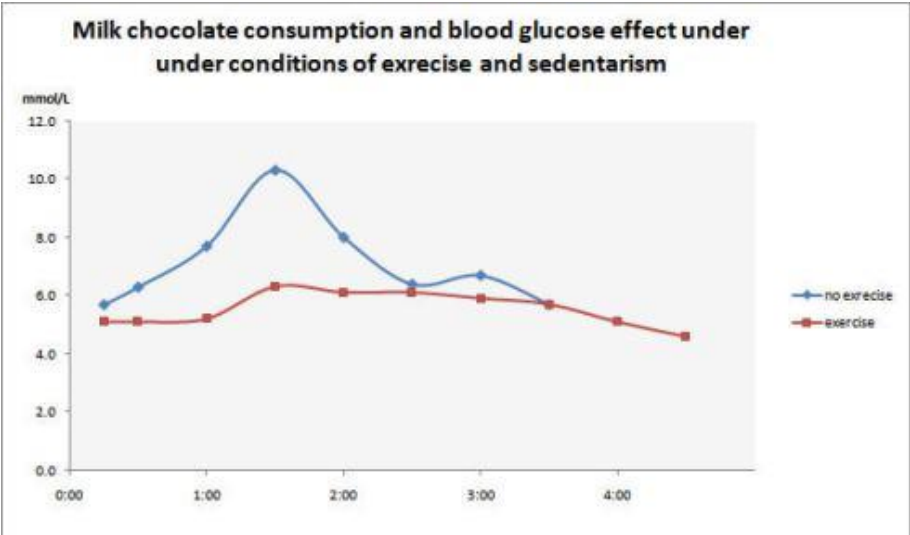
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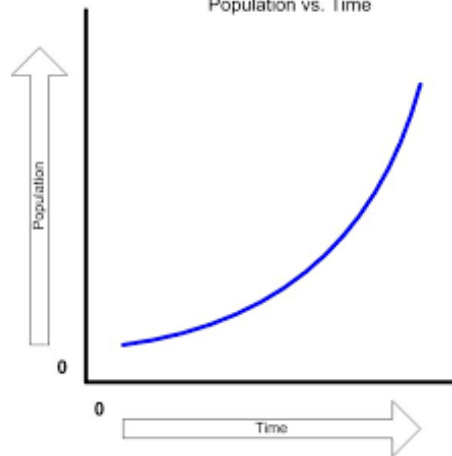
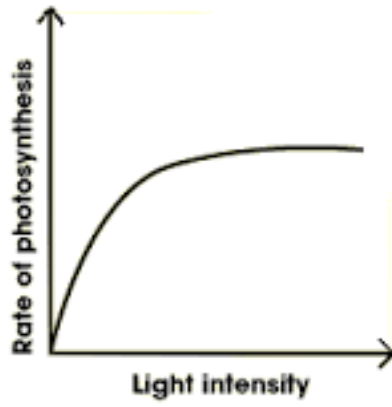
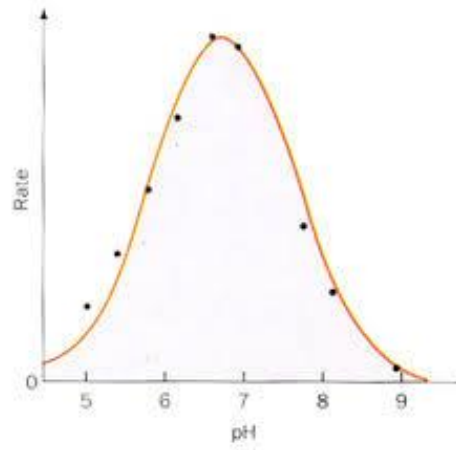
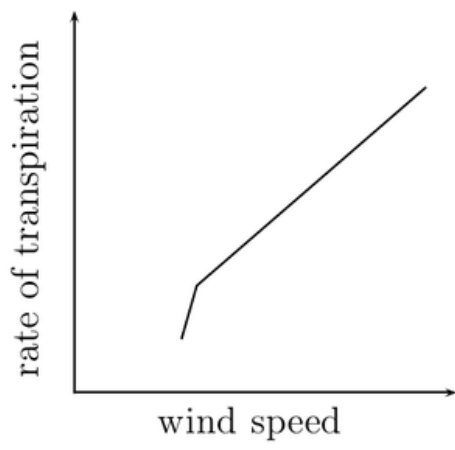
(3)

5. A medical research team investigated how quickly the body deals with glucose after a meal. They studied the blood glucose concentration of people who exercised versus those who did not. Here are their results:



- a) What organ in the body regulates blood glucose concentration?
.....
(1)
- b) Explain how the stages that would bring about a return to normal blood glucose concentrations.
.....
.....
.....
(4)
- c) Name one variable the researchers will have controlled.
.....
(1)
- d) The researchers made the following conclusion:
 “Blood glucose returns to normal values for all people after 4 hours”
To what extent do you agree with this conclusion.
.....
.....
.....
(3)

6. Scientists need to be able to interpret data in graphs to decide if there are trends in the results.
For each graph bellow, describe the trend.
.....
.....
.....
.....
(4)



PART 2

1.1 Explain why cells are often stained before being viewed with a light microscope. **[2]**

1.2 Microscopes can be used to measure the size of a cell.

Name the equipment that has an accurate scale in micrometres engraved on it.

Circle **one** answer. **[1]**

- | | |
|-----------------------------|---------------------------|
| A eyepiece graticule | B eyepiece lens |
| C objective lens | D stage micrometer |

1.3 Define resolution. **[1]**

2.1 Match these measurement terms to their definitions. **[2]**

- | | |
|---------------------|---|
| precise | result is close to true value |
| reproducible | value in a set of results is ruled out as erroneous |
| anomaly | measurements are close to a mean value |
| accurate | original experimenter gets the same results if they do it again |
| repeatable | another person gets the same results |

2.2 Which type of error occurs due to unpredictable variation around the true value?

Circle **one** answer. **[1]**

- | | |
|----------------------------|-----------------------|
| A measurement error | B random error |
| C systematic error | D zero error |

2.3 Which type of error occurs due to using a balance that reads 0.03 g when nothing is sitting on it?

Circle **one** answer.

[1]

A measurement error

B random error

C systematic error

D zero error

3.1 Name the site where ribosomes are produced.

Tick **one** box.

[1]

A lysosomes

B mitochondria

C nucleolus

D vesicles

3.2 Name the site where waste material is broken down.

Tick **one** box.

[1]

A lysosomes

B mitochondria

C nucleolus

D vesicles

3.3 Compare the functions of the two types of endoplasmic reticulum.

[3]

3.4 Name two types of extension that protrude from some cells

[2]

4.1 Complete the table below.

[2]

prefix	index
micro	
	10^{-3}
centi	
	10^{-9}
kilo	

4.2 The mass of an object measured on a 4 decimal place balance is 7.0855 g

What is this mass to 3 significant figures?

[1]

A 7.09 g

B 7.19 g

C 7.085 g

D 7.086 g

5.1 A student measures the actual width of a cell. The cell was 0.006 mm.

Express this value in metres using standard form.

[1]

answer = _____ m

5.2 Convert this value to μm .

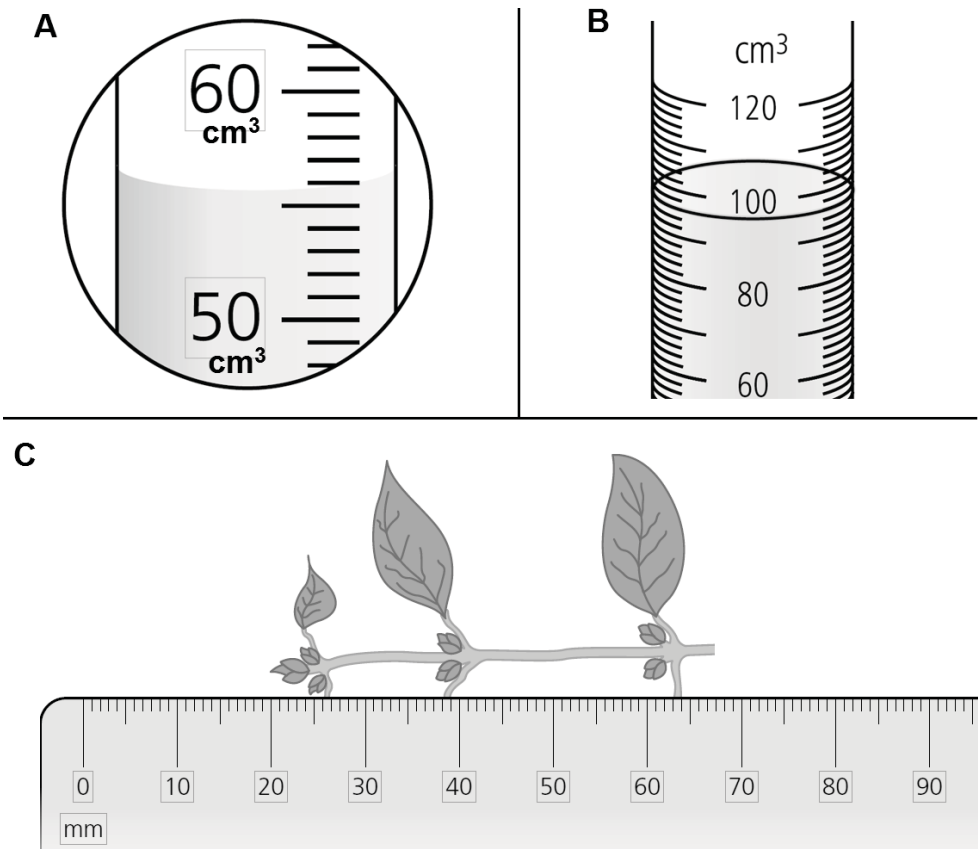
answer = _____ μm

5.3 The size of the image seen was 2.4 mm. Calculate the magnification used.

[2]

magnification = _____

6.1 For the following images give the measurements and measurement uncertainties. [6]



A _____ cm^3
B _____ cm^3
C _____ mm

6.2 For each of the examples (A–C) above, calculate the relative error. [3]

A _____ cm^3
B _____ cm^3
C _____ mm

Total = 30 marks

Name..... Set..... Date(s).....

PAG 12.4 Researching one organelle

1.2.1 Use and application of scientific methods and practices		Achieved?					
(h) use online and offline research skills including websites, textbooks and other printed scientific sources of information							
<table><tr><th>Criteria</th><td></td></tr><tr><td>There is evidence that a website, a textbook and journal article have been used to inform the production of this piece of work</td><td></td></tr></table>			Criteria		There is evidence that a website, a textbook and journal article have been used to inform the production of this piece of work		
Criteria							
There is evidence that a website, a textbook and journal article have been used to inform the production of this piece of work							
(i) correctly cite sources of information							
<table><tr><th>Criteria</th><td></td></tr><tr><td>There is in-text referencing of a website, a textbook and a journal article</td><td></td></tr><tr><td>The reference list contains a reference for a website, a textbook and a journal article, following the conventions for referencing these types of source material</td><td></td></tr></table>		Criteria		There is in-text referencing of a website, a textbook and a journal article		The reference list contains a reference for a website, a textbook and a journal article, following the conventions for referencing these types of source material	
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Introduction

This homework provides you with the opportunity to learn how to conduct a literature search for scientific writing and how to follow the conventions the scientific community uses to reference the information found in other people's work, in your own writing.

Aim

- To research, and produce, a short, appropriately referenced article on one organelle.

Topics to research

You can research any aspect of organelles that interests you. The list below shows some of the organelles that you could research. Your article could be an introduction to one of these organelles or be something that is more focused on one particular aspect of that organelle.

- | | |
|---|---|
| 1. Nucleus, nucleolus or nuclear envelope | 10. Centrioles |
| 2. Rough endoplasmic reticulum | 11. Cell wall (plant or prokaryotic) |
| 3. Smooth endoplasmic reticulum | 12. Flagellum (eukaryotic or prokaryotic) |
| 4. Golgi apparatus | 13. Cilia |
| 5. Ribosome (eukaryotic or prokaryotic or both) | 14. Plasmid |
| 6. Mitochondrion | 15. Bacterial chromosome |
| 7. Lysosome | 16. Pili |
| 8. Chloroplast | 17. Slime capsule |
| 9. Plasma membrane | |

Writing your article

Your article should:

- be word processed
- be about 500 words excluding the title, diagrams and references
- be a general introduction to an organelle, or be a more focused article on a particular aspect of an organelle
- be written in your own words (anything, more than about 3 words, that you want to directly quote from someone else's work must be in quotation marks)
- have a title
- follow the Harvard referencing system (see OCR guidance below)
- include some "in text" referencing (see OCR guidance below)

8. have a “reference list” at the end which appropriately references (see OCR guidance below) at least:
 - a. one website
 - b. one journal article
 - c. one book
9. have a word count at the end of the article (use the function in Word to do a word count for you)

Doing the research for your article

Finding scientific journal articles

The scientific community is slowly moving towards free public access of scientific research. Although many scientific articles are behind paywalls, there is a significant body of work that is free to access by all. You can use google scholar (<http://scholar.google.co.uk/>) to search for scientific articles. If there is a hyperlink next to an article returned from your search it will usually be free access – try those first and never pay for access to an article.

PLOS(public library of science) is a driver in the area of open access research articles and you can find many excellent scientific articles by searching there (<https://www.plos.org/>)

Scitable is a website run by the publishers of Nature and Scientific American that publishes very accessible articles (<http://www.nature.com/scitable>).

You can also find articles in journals stocked by the library such as biological sciences review.

Finding books

The best place to find suitable books is in the college library or a local public library. You can also search for online open access books but in order to reference them as a book they need to have been published in paper format and you need to reference them as a book.

Finding websites

You probably need no guidance in finding websites but do consider the reliability of the information you use. Wikipedia is often very good on biology topics but check that the page you are reading is well referenced. You might also find useful information on news websites such as the BBC or various newspaper websites. Most scientific institutions and interest groups have websites where they publish information that may be useful to you.

Submitting your article

Your article should:

1. be handed in with these PAG instructions stapled to the front of it
2. have your name, set and the date on the PAG instructions where indicated

Referencing – OCR guidance

One of the requirements of the Practical Endorsement is that learners demonstrate that they can correctly cite sources of information. The point of referencing is to provide the sources of information that have been used to produce the document, and to enable readers to find that information. There are many different systems of reference in use; the most important thing for learners to appreciate at this level is that they should be consistent in how they reference, and that they provide sufficient information for the reader to find the source.

Systems of citation

Wherever a piece of information that has been retrieved from a source is provided in a text, an intext citation should be included that links to the full original source in the reference list. There are two main systems of in-text citation: the Vancouver system, which uses numerical citations, and the parenthetical system (of which the Harvard system is the best known version), in which limited reference information is given in brackets in the text. Learners are likely to find the Harvard system easier to handle. However, learners should be aware of the Vancouver system as they may come across this system in their secondary research. It does not matter which system learners use in the context of the requirements for the Practical Endorsement. However, referencing should be complete and consistent. If learners are already using a particular referencing system in another area of study, for example for an Extended Project qualification, it would make sense if they use the same system within their Biology studies.

Vancouver system

The Vancouver system looks like this:

The density of viable bacteria in a culture can be estimated by creating serial dilutions, plating out and counting colonies.¹

The full references are given in a numbered list at the end of the document, with each number linked to the appropriate reference, e.g.:

1. Bloggs, J. (2011) *Microbiology*, 2nd ed., Cambridge, Practical Biology Publications

The references are ordered in the sequence in which they are first cited in the text. The numbers are repeated in the in-text citations as required, so the same number is always used to cite a given reference.

Parenthetical (Harvard) system

The parenthetical system looks like this:

The density of viable bacteria in a culture can be estimated by creating serial dilutions, plating out and counting colonies (Bloggs, 2011).

The author(s) and date of the work are included in brackets at the appropriate point in the text. In this case, the list of full references at the end of the document is ordered alphabetically, and the references are not numbered. For multi-author works, the full list of names is usually not given in in-text references. Rather, the first name is given followed by 'et al.'. This is commonly done for works with more than three authors.

References

While different referencing systems have minor variations in how they present complete references, the basic information provided is always very similar, and based on the principle of providing sufficient information so that the reader can find the information source. An overview is given below of standard referencing formats for the types of sources that learners are likely to cite.

Books

General reference format:

Authors (year), *Title*, edition (if relevant), publisher's

location, publisher For example:

Roberts, M.B.V. (1986), *Biology – A Functional Approach*, 4th ed., Cheltenham,

Nelson Thornes For books that have an editor or editors, include (ed.) or (eds)

after the names.

If a book does not have named authors or editors, the reference begins with the title, e.g.:

CLEAPSS Laboratory Handbook (2001), Uxbridge, CLEAPSS School Science Service

Journal articles

General reference format:

Authors (year), 'Article title', *Journal title*, vol. no, issue no,

pp. xxx–xxx For example:

Meredith, Jr, J. E., Fazeli, B., Schwartz, M. A. (1993), 'The extracellular matrix as a cell survival factor',

Mol. Biol. Cell, vol. 4, no 9, pp. 953–961

Websites

General reference format:

Authors (year), *Title*. [online] Last

accessed date: URL For example:

Goldacre, B. (2010), *The stigma gene*. [online] Last

accessed 4 April 2015:

<http://www.badsience.net/2010/10/pride-and-prejudice/>

Webpages and online resources frequently do not have individual authors. In that case, the name of the organisation is given.

Nuffield Foundation (2011), *Maintaining and preparing cultures of bacteria and yeasts*. [online] Last accessed 28 February 2015:

<http://www.nuffieldfoundation.org/practical-biology/maintaining-and-preparing-cultures-bacteria-and-yeasts>

Similarly, it is often not possible to find the year in which online material or documents were produced. In that case, use the year in which the information was sourced.

If no author or organisation can be found, reference the website by title. However, in that case due consideration should be given as to whether the website is a trustworthy source!