

GET READY TO STUDY A LEVEL BIOLOGY

If you are planning to study A Level Biology with us in September, please review this document and complete the required activities. Please bring the completed activities with you at induction.

FAQ

What specification will I study?

AQA A Level Biology [AQA | AS and A-level | Biology | Specification at a glance](#)

How many lessons will I have a week?

You'll have 4 lessons a week, each lesson is 1 hours and 5 minutes

Who can I contact if I have a question about this subject?

Tracy Rowland t.rowland@barnsley.ac.uk

What subjects go well with Biology?

Chemistry, Maths, Psychology, PE, Geography, Computer Science, Physics

Our advice is not to choose Biology as a "third choice" if you do not need it for progression to university.

What grades should I have?

In addition to the general sixth form entry requirements, learners should have GCSE Grade 6 or above in Biology and another science or two Grade 6s or above in Combined Science. Plus GCSE Grade 5 or above in Mathematics.

WHAT WILL I STUDY?

In Year 1, you will study the following topics:

Biological molecules

Cells

Organisms exchange substances with their environment

Genetic information, variation and relationships between organisms

In Year 2, you will study the following topics:

Energy transfers in and between organisms

Organisms respond to changes in their internal and external environments

Genetics, populations, evolution and ecosystems

The control of gene expression

The assessment for the A-level consists of three exams, which you will take at the end of the course.

| Paper 1 | Paper 2 | Paper 3 |
|---|---|--|
| What's assessed <ul style="list-style-type: none">Any content from topics 1-4 including relevant practical skills | What's assessed <ul style="list-style-type: none">Any content from topics 5 – 8 including relevant practical skills | What's assessed <ul style="list-style-type: none">Any content from topics 1-8 including relevant practical skills |
| How it's assessed <ul style="list-style-type: none">Written exam: 2 hours91 marks35% of the A-level | How it's assessed <ul style="list-style-type: none">Written exam: 2 hours91 marks35% of the A-level | How it's assessed <ul style="list-style-type: none">Written exam: 2 hours78 marks30% of the AS-level |
| Questions <ul style="list-style-type: none">76 marks: a mixture of short and long answer questions15 marks: extended response questions | Questions <ul style="list-style-type: none">76 marks: a mixture of short and long answer questions15 marks: extended response questions | Questions <ul style="list-style-type: none">38 marks: structured questions, including practical techniques15 marks: critical analysis of given experimental data25 marks: one essay from a choice of two titles |

WHAT WILL I NEED?

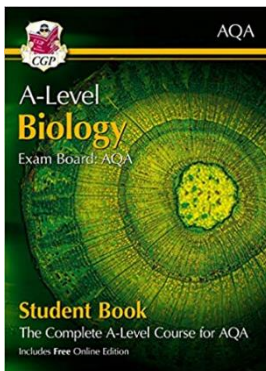
To study the course you will need the following equipment:

- A scientific calculator
- A folder with dividers
- Lined paper
- Pens and pencils
- Highlighters
- A ruler

Students also find it useful to have:

- Blank flashcards
- A whiteboard and whiteboard pens

We also require all students buy a textbook, lab coat and safety glasses, these can be purchased from the college at the start of term. Financial support is available.



FIND OUT MORE

These activities are to help broaden your understanding of the subject in preparation for studying this subject at an advanced level.

| | |
|-----------------------------------|--|
| Careers | Careers & CPD (rsb.org.uk) What can I do with a biology degree? Prospects.ac.uk Step into the NHS help young people discover NHS careers |
| YouTube | Miss Estruch - YouTube Amoeba Sisters - YouTube https://youtube.com/c/PrimroseKittenScience |
| Further Reading / Useful websites | AQA Science AS and A-level Biology Biology Revision - PMT (physicsandmathstutor.com) |

REQUIRED ACTIVITIES

It is important that all the required activities are completed in preparation for starting your course.

Choosing your A Levels can be a challenge for some learners therefore if you are undecided around which subjects you are planning to study completing these activities will give yourself greater insight into the course to help ensure you have made the right choice.

Task 1:

Download and work through the GCSE to A Level Biology progression booklet (link below).

[AQA-7401-7402-GCSE-A-LEVEL-PROGRESSION-ACTIVITIES.DOCX \(live.com\)](https://www.live.com/AQA-7401-7402-GCSE-A-LEVEL-PROGRESSION-ACTIVITIES.DOCX)

Task 2:

Print the following questions, or answer on separate paper. Complete **all 6** questions to the best of your ability, you may research your answers using textbooks and/or the internet but all work **MUST** be written in your own words. You may use a calculator for calculations but please show your working out.

Bring the completed questions to submit on induction day.

INDUCTION TASK

1. Research the structures and functions of the named biological molecules and complete the table below. You may want to create a larger table.

| Biological Molecule | Name and draw the simplified structure of the molecule or a monomer it is made from | Name of the main bond joining monomers | Functions and any further information |
|---------------------|---|--|---------------------------------------|
| Glycogen | | | |
| Triglycerides | | | |
| Amylase | | | |
| DNA | | | |

2. Explain how a vaccination can provide protection from infectious disease.

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.....(attach extra sheets if needed)

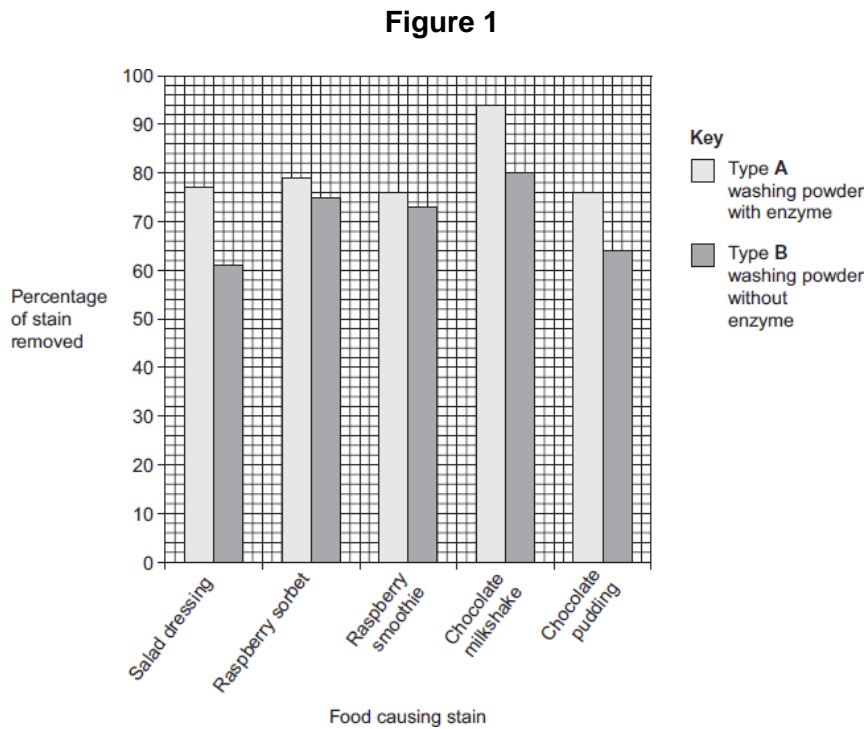
3.

Biological washing powders contain enzymes which hydrolyse substances that cause stains on clothes.

A manufacturer tested the ability of two types of the same brand of washing powder to remove different food substances that stain clothes.

- Type **A** contained an enzyme.
- Type **B** was identical to **A** except it did **not** contain the enzyme.

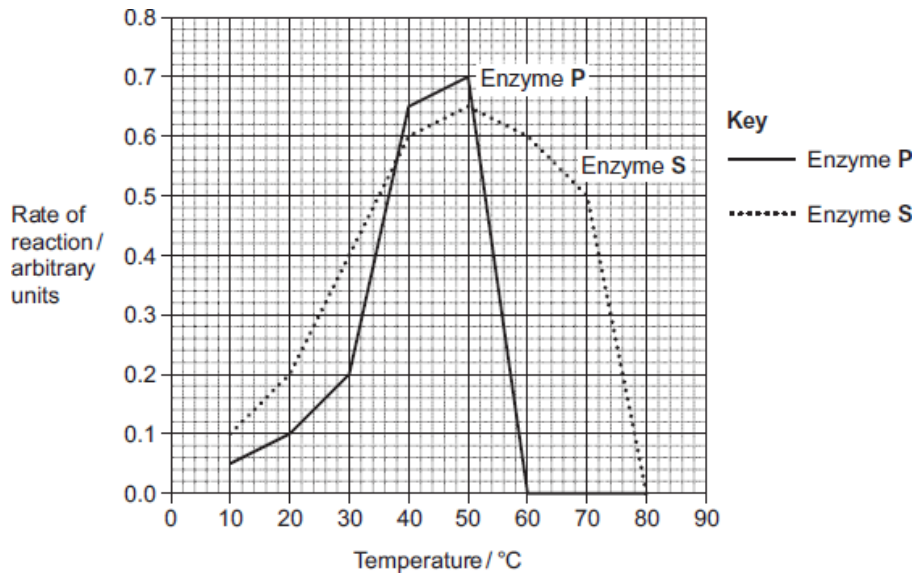
Figure 1 shows the results.



A scientist worked for a company that wanted to develop a biological washing powder that was effective over a range of temperatures. He investigated the effect of temperature on the rates of the reaction catalysed by two enzymes, **P** and **S** used in biological washing powders.

Figure 2 shows his results.

Figure 2



- (a) Many of the substances causing the food stains are large, insoluble proteins. Suggest how a biological washing powder removes this type of stain.

(2)

- (b) The manufacturer of type **A** and type **B** washing powder claimed that these results showed that biological washing powders are better at removing stains from clothes.

Use the information in **Figure 1** to evaluate this claim.

(4)

- (c) Most customers want a washing powder which removes stains from clothes over a range of temperatures. After obtaining the results shown in **Figure 2**, which enzyme should the scientist recommend for use in a

biological powder?

Give reasons for your answer.

(3)

- (d) Biological washing powders often contain a number of different enzymes. This enables them to remove a wider range of stains from clothes. Explain why a number of enzymes are required to remove a wider range of stains.

(3)

(Total 12 marks)

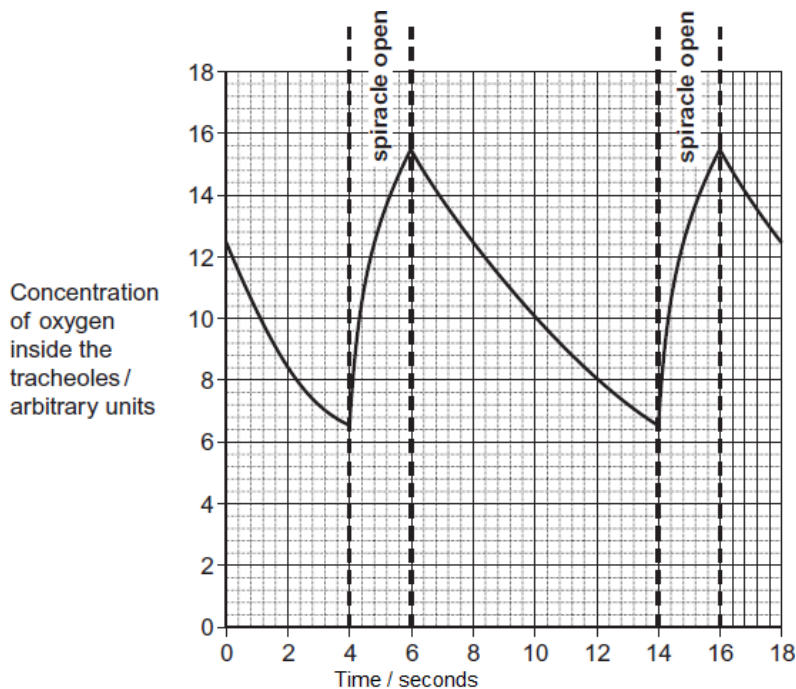
4. Large insects contract muscles associated with the abdomen to force air in and out of their bodies through small holes called spiracles. This is known as 'abdominal pumping'. The table shows the mean rate of abdominal pumping of an insect before and during flight.

| Stage of flight | Mean rate of abdominal pumping/dm ³ of air kg ⁻¹ hour ⁻¹ |
|-----------------|---|
| Before | 42 |
| During | 186 |

- (a) Calculate the percentage increase in the rate of abdominal pumping before and during flight. Show your working.

Answer _____ %

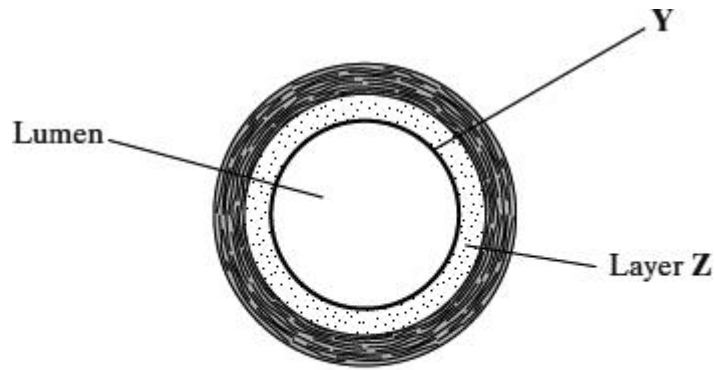
Spiracles are able to open and close in response to differing environmental conditions. The graph shows the concentration of oxygen inside an insect (in tubes called tracheoles) when at rest. It also shows when the spiracles are fully open.



- (b) Use the graph to calculate the frequency of spiracle opening. Show your working.

Frequency _____ times per minute (2)

5. The diagram shows a cross-section of an artery.



Magnification $\times 10$

- (a) What type of tissue is in the layer labelled Y?

(1)

- (b) Layer Z contains a high proportion of elastic tissue.

Describe the advantage of having elastic tissue in the wall of an artery.

(2)

- (c) Calculate the cross-sectional area of the lumen of the artery shown in the diagram. Show your working.

The area of a circle is given by πr^2 , where r is the radius of a circle ($\pi = 3.14$).

Answer _____ mm^2

(3)

(Total 6 marks)

6. Compare the structures of xylem and phloem vessels and explain the function of each type of vessel.

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