

# **Alevel Biology**

## **Summer Work Booklet**



PETERBOROUGH KEYS  
ACADEMIES TRUST

## Task 1 – Preparation

1. Familiarise yourself with the tables below which details how the course is assessed and structured.

### Specification at a glance

#### AS and first year of A-level

- 1 Biological molecules.
- 2 Cells.
- 3 Organisms exchange substances with their environment.
- 4 Genetic information, variation and relationships between organisms.

#### A-level only

- 5 Energy transfers in and between organisms.
- 6 Organisms respond to changes in their internal and external environments.
- 7 Genetics, populations, evolution and ecosystems.
- 8 The control of gene expression.

### The assessment for the A-level consists of three exams

Paper 1	+	Paper 2	+	Paper 3
<b>What's assessed</b> <ul style="list-style-type: none"> <li>Any content from topics 1–4, including relevant practical skills</li> </ul>		<b>What's assessed</b> <ul style="list-style-type: none"> <li>Any content from topics 5–8, including relevant practical skills</li> </ul>		<b>What's assessed</b> <ul style="list-style-type: none"> <li>Any content from topics 1–8, including relevant practical skills</li> </ul>
<b>Assessed</b> <ul style="list-style-type: none"> <li>written exam: 2 hours</li> <li>91 marks</li> <li>35% of A-level</li> </ul>		<b>Assessed</b> <ul style="list-style-type: none"> <li>written exam: 2 hours</li> <li>91 marks</li> <li>35% of A-level</li> </ul>		<b>Assessed</b> <ul style="list-style-type: none"> <li>written exam: 2 hours</li> <li>78 marks</li> <li>30% of A-level</li> </ul>
<b>Questions</b> <ul style="list-style-type: none"> <li>76 marks: a mixture of short and long answer questions</li> <li>15 marks: extended response questions</li> </ul>		<b>Questions</b> <ul style="list-style-type: none"> <li>76 marks: a mixture of short and long answer questions</li> <li>15 marks: comprehension question</li> </ul>		<b>Questions</b> <ul style="list-style-type: none"> <li>38 marks: structured questions, including practical techniques</li> <li>15 marks: critical analysis of given experimental data</li> <li>25 marks: one essay from a choice of two titles</li> </ul>

2. **Download the full specification at read through and familiarise yourself with the structure of the course** (<https://filestore.aqa.org.uk/resources/biology/specifications/AQA-7401-7402-SP-2015.PDF>)

## Task 2 – Revision from GCSE

Before you can move onto A level it is important that you are building on a solid base from your GCSE studies. Below is a range of revision resources you may use to revise.

Start by looking at the topics listed in the grid and then move onto the revision organisers below. Once these have been completed you may also wish to try the quizzes in the grid for review.

Please make sure you bring your revision with you to the first couple of lessons of A level biology where they will be used. Remember you will be sitting an induction test within the first few lessons, the content of which will be limited to GCSE knowledge.

**Remember there is a whole range of resources you can use in order to revise – some are listed below for convivence.**

**General links:** video directory for GCSE science: [www.revisely.co.uk/gcse/science/aqa](http://www.revisely.co.uk/gcse/science/aqa)

**Useful revision resource with detailed notes:** [www.savemyexams.co.uk/gcse-biology-aqa-new/revision-notes/](http://www.savemyexams.co.uk/gcse-biology-aqa-new/revision-notes/)

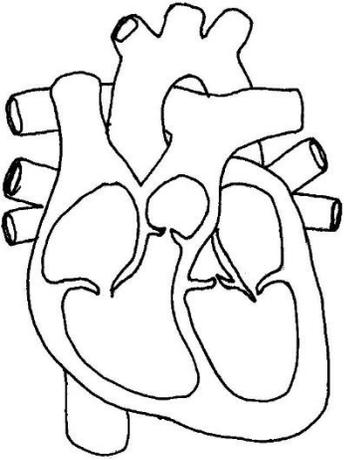
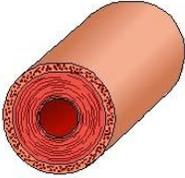
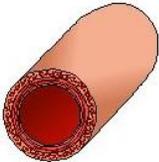
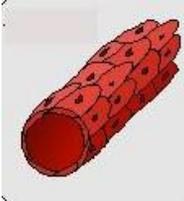
**Bitesize:** [www.bbc.co.uk/bitesize/subjects/z9ddmp3](http://www.bbc.co.uk/bitesize/subjects/z9ddmp3)

**Seneca learning:** [senecalearning.com/en-GB/blog/gcse-biology-revision/](http://senecalearning.com/en-GB/blog/gcse-biology-revision/)

**Please note you will also be tested on these key maths skills:**

- Averages
- Percentages
- Ratios
- Drawing tangents on graphs and lines of best fit

Subjects	Topics included	Quiz
Biological molecules	<ul style="list-style-type: none"> <li>• Proteins</li> <li>• Enzyme properties</li> <li>• Enzyme functions</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/z88hcj6/test">https://www.bbc.co.uk/bitesize/guides/z88hcj6/test</a> <a href="https://primrosekitten.org/courses/aqa-gcse-science-combined-science-higher/lessons/organisation-2/quizzes/gcse-enzymes/">https://primrosekitten.org/courses/aqa-gcse-science-combined-science-higher/lessons/organisation-2/quizzes/gcse-enzymes/</a>
Cell structure	<ul style="list-style-type: none"> <li>• Eukaryotic and prokaryotic cells</li> <li>• Microscopes</li> <li>• Functions of the organelles in particular the nucleus, mitochondria and cell wall</li> <li>• Movement into and out of cells – diffusion, osmosis and active transport</li> </ul>	<a href="https://www.bbc.co.uk/bitesize/guides/z3vypbk/test">https://www.bbc.co.uk/bitesize/guides/z3vypbk/test</a> <a href="https://discover tutoring.co.uk/quiz/biology/microscopy/">https://discover tutoring.co.uk/quiz/biology/microscopy/</a> <a href="https://www.bbc.co.uk/bitesize/guides/zc7k2nb/test">https://www.bbc.co.uk/bitesize/guides/zc7k2nb/test</a>
The Circulatory System	<ul style="list-style-type: none"> <li>• The circulatory system</li> <li>• The heart</li> <li>• Coronary heart disease</li> <li>• Blood vessels (include hepatic portal vein)</li> <li>• Components of blood</li> </ul>	<a href="https://www.footprints-science.co.uk/index.php?quiz=The_heart">https://www.footprints-science.co.uk/index.php?quiz=The_heart</a> <a href="https://discover tutoring.co.uk/quiz/biology/the-heart/">https://discover tutoring.co.uk/quiz/biology/the-heart/</a> <a href="https://www.bbc.co.uk/bitesize/guides/zw3bfcw/test">https://www.bbc.co.uk/bitesize/guides/zw3bfcw/test</a>
Disease & Immunity	<ul style="list-style-type: none"> <li>• Pathogens</li> <li>• Disease</li> <li>• Immunity</li> </ul>	<a href="http://www.educationquizzes.com/gcse/science/biology-fighting-disease-aqa-syllabus-a/">www.educationquizzes.com/gcse/science/biology-fighting-disease-aqa-syllabus-a/</a>
Genetics & Cell Division	<ul style="list-style-type: none"> <li>• Chromosomes</li> <li>• DNA and protein synthesis</li> <li>• Cell division (mitosis)</li> <li>• Cell division (meiosis)</li> </ul>	<a href="https://www.cliffsnotes.com/study-guides/biology/biology/gene-expression-molecular-genetics/quiz-protein-synthesis">https://www.cliffsnotes.com/study-guides/biology/biology/gene-expression-molecular-genetics/quiz-protein-synthesis</a> <a href="https://www.bbc.co.uk/bitesize/guides/z2kmk2p/test">https://www.bbc.co.uk/bitesize/guides/z2kmk2p/test</a>
Variation, Evolution & Classification	<ul style="list-style-type: none"> <li>• Variation</li> <li>• Evolution</li> <li>• Classification</li> </ul>	<a href="https://primrosekitten.org/courses/aqa-a-level-biology/lessons/species-and-taxonomy/quizzes/classification-and-taxonomy/">https://primrosekitten.org/courses/aqa-a-level-biology/lessons/species-and-taxonomy/quizzes/classification-and-taxonomy/</a>
Exchange	<ul style="list-style-type: none"> <li>• Lungs and lung structure</li> <li>• Size &amp; SA:V Ratio</li> </ul>	<a href="https://discover tutoring.co.uk/quiz/biology/exchange-of-materials/">https://discover tutoring.co.uk/quiz/biology/exchange-of-materials/</a>

<p>Label the diagram below.</p> 	<p>What blood vessel is this? How is this adapted?</p> 	<p>What blood vessels is this? How is it adapted?</p> 	<p>What blood vessel is this? How is it adapted?</p> 
	<p>What is the route of blood around the body?</p>	<p>What is the function of platelets?</p>	<p>Name the 2 major arteries and 2 major veins</p>
<p>What is the name of the yellow fluid that transports the components of blood and co2 around the body?</p>	<p>What is the function of valves in the circulatory system?</p>	<p>What is the structure of the lungs made up of? How is it adapted for gaseous exchange?</p>	<p>How is coronary heart disease caused? State 3 ways it can be treated</p>
<p>What name is given to the cells on the right atrium that controls heart rate?</p>	<p>Which side of the heart is bigger and why?</p>	<p>What is the problem with faulty heart valves? How can this be treated?</p>	<p>What is the function of red blood cells and how are they adapted?</p>

# Cells and Organisation

Draw the two different types of eukaryotic cells and label the organelles

Describe the differences between a eukaryotic and prokaryotic cell

Give an example of a specialised cell and explain how it is adapted to its function

Give the function of the:

Nucleus

Mitochondria

Ribosome

Chloroplast

Cell Wall

Vacuole

Cell Membrane

Cytoplasm

Use pictures and words to describe each process:

Diffusion

Osmosis

Active Transport

# Infection

What is a pathogen?

What is a protist? Give an example of a disease it causes

How can we reduce or prevent the spread of disease?

How do bacteria and viruses cause disease?

How can the spread of malaria be controlled?

Give an example of a bacterial disease, explaining how it is caused and can be treated

Give an example of a fungal, explaining how it is caused and can be treated

Give an example of a viral disease and explain how it is caused.

# DNA

What is a genome?

How does the structure of DNA affect the protein made?

Where is DNA found?

What is a gene?

Describe protein synthesis

How do mutations occur?

Why is studying the human genome important?

Describe the structure of DNA

What is the function of non-coding DNA?

# Evolution and Variation

What is variation and how does it occur?

What is selective breeding and how is it different from natural selection?

What is a species?

How can selective breeding lead to disease inheritance?

What is evolution?

How does evolution occur through natural selection?

Explain the benefits and risks of selective breeding

What is natural selection?

# Classification

Describe the Linnaeus system of classification

How are organisms named?

What might an organism be classified based on?

Why is a new model of classification required?

How might scientists classify an organism that is dead?

Describe the three domain system

What does an evolutionary tree show?

