**Bridging work: GCSE to A level**

**Subject:** **Biology**

**Teachers**: Miss A Heath (Head of Science)

We want you to be really successful and what it takes to be successful at GCSEs is different from being successful at A-Levels. Although you have fewer subjects there are different skills at A-Level and the volume of work is greater because the depth and detail is more demanding.

Bridging the Gap Work will reassure you that the subject you have selected is for you, or allow you time to change your choice of subject at enrolment, as long as there is space and you meet the entry criteria. We want you to study a course that interests you and you are sufficiently qualified to study.

You may wish to purchase the following books to help you:-

* **Head Start to A-level Biology (**ISBN: 9781782942795)
* **Essential maths skills for A Level Biology (**ISBN: 9781847623232)

**Suggested Reading List:** This is a list of books that it is suggested you may wish to read before, or during you’re ALevel course. You are not expected to read them all!

• How We Live and Why We Die: the secret lives of cells

• Sapiens: A Brief History of Humankind

• Oxygen: The molecule that made the world

• A Short History of Nearly Everything

• The Gene: An Intimate History

• The Epigenetics Revolution

**Additional Guidance**

• Work may be word processed or handwritten (unless specified). Any work word processed must be printed and filed.

• All work must be filed in an A4 folder, ready for checking in September.

• All exam questions should be completed in full. These should then be self-assessed using the mark scheme provided.

**Aim of Bridging Work:** The aim of this bridging work is to help you make the transition from GCSE to A level Biology. You will be set work on a weekly basis that will focuses on one key topic. This work should help you to recall what you did at GCSE, and help you to prepare for studying a key idea or skill in A level Biology.

**Equipment List For September:**

• Pens, Pencils and Highlighters

• A4 Ring binder and folder dividers

• Lined/Plain paper

• Ruler

• Scientific Calculator

**The aim of Week 1 bridging work is**:

• Recall the parts of animal and plant cells.

 • Describe the difference between prokaryotic and eukaryotic cells.

 • Explain the adaptations of specialised cells

**Week 1 Bridging Tasks**

**Task 1**

**The following resources will help you with the first two tasks:**

1. <https://www.bbc.co.uk/bitesize/guides/zpqpqhv/revision/7>
2. <https://www.bbc.co.uk/bitesize/guides/zpqpqhv/revision/8>

1. Draw and label an animal and plant cell using your GCSE knowledge.

2. Complete a table to outline the function of the following organelles; cell membrane, nucleus, cell wall, cytoplasm, mitochondria, vacuole, chloroplast, ribosome.

3. Research and make notes on the following new organelles; endoplasmic reticulum, Golgi apparatus, and Lysosomes. You may wish to add further details on some of the other parts of the cell that you have previously studied. https://alevelbiology.co.uk/notes/organelles/ may help you with this but please do use your on research.

 **Task 2**

1. Define the terms prokaryotic and eukaryotic.

synthesising 2. Using the following resources, produce a table to compare any similarities and differences between prokaryotic and eukaryotic cells.

a. <https://www.bbc.co.uk/bitesize/guides/zy28h39/revision/6>

 b. https://www.youtube.com/watch?v=kGd-5HSDo6g

 **Task 3**

1. Define the term specialised cell.

2. Research at least two specialised animal cells and two specialised plant cells. You must include a diagram and a description of what they look like (their structure) and what specific function they perform. Examples of cells you may choose to research include; red blood cell, epithelial cell, sperm cell, muscle cell, neurone, egg cell, phloem cell, xylem cell, root hair cell, palisade cell, guard cell.

 3. Explain the relationship between cells, tissues, organs and organ systems. You may do this in a paragraph or using a diagram.

**Extension**

At A-level you will be expected to understand the structure and function of the organelles in even greater detail. Research the structure and function of the following organelles; mitochondria, cell membrane (sometimes referred to as the plasma membrane), vacuole and ribosomes.

**The aim of Week 2 bridging work is:**

 • Define key terminology used in microscopy and recall the equation for magnification.

 • Compare and contrast the different types of microscope.

 • Explain how to use a light microscope.

 • Convert units and complete microscopy calculations.

**Task 1**

Microscopes are one of the most important tools that Biologists have had at their disposal for the last 250 years. They have helped us understand much more about the world around us, and have aided us in making some of the most important scientific breakthroughs in science such as the discovery and classification of bacteria, and the development of penicillin.

1. Watch <https://www.bbc.co.uk/bitesize/guides/zpqpqhv/revision/1>

 2. Find out and write down the definition for the terms magnification and resolution.

 3. Find out and write down the equation which links together magnification, image size and actual size

**Task 2**

In Biology there are three main types of microscope we use; the light microscope (which you will have used at KS3 and KS4), the transmission electron microscope, and the scanning electron microscope.

The following resources may help you with the tasks below:

<https://alevelnotes.com/notes/biology/cells/cell-structure/magnification>

<https://www.ivyroses.com/Biology/Techniques/light-microscope-vs-electron-microscope.php>

1. Research and produce a brief summary of the key features, benefits and drawbacks of each type of microscope.

2. Produce a table to compare the main similarities and difference between light microscopes and electron microscopes.

**Task 3**

1. Watch this video from YouTube about how to use a microscope https://www.youtube.com/watch?v=SX6mow1AExI 2. Make a set of bullet pointed notes on how to use a microscope. Try to keep your bullet points to a maximum of ten so that your information is concise.

**Task 4**

You are probably familiar with measuring things in millimetres (mm), centimetres (cm), metres (m) and kilometres (km), and selecting which unit would be best to use for measuring different objects. In Biology we must be confident in using and converting between much smaller units and showing small (or sometimes very large) numbers in standard form.

1. Find out the following

 a. How many millimetres are in one metre?

 b. How many micrometres in one millimetre?

 c. How many micrometres in one nanometre?

2. Watch this video on YouTube about unit conversions <https://www.youtube.com/watch?v=paITDZ6wAAM> make notes on how to covert units.

 3. Read the information and watch the video on the BBC website at <https://www.bbc.co.uk/bitesize/guides/zxsv97h/revision/1> on standard form. Make notes as necessary.

**Task 5**

1. Complete the questions on the ‘Measurements in Microscopy’ worksheet.

2. Mark your answers using the mark scheme provided.

3. File your exam questions and your notes from the previous tasks.

**The aim of Week 3 bridging work is:**

* Define key terminology used in the transport of molecules into and out of cells
* Describe diffusion, osmosis and active transport
* Explain the processes of diffusion, osmosis and active transport
* Compare and contrast diffusion, osmosis and active transport

**Task 1**

Read: <https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/1> <https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/2>

Watch: <https://www.youtube.com/watch?v=LUPHohqlPTU>

1. Make notes on the process of diffusion. You must ensure that your notes contain the following key points

a. A definition of diffusion. You may choose to use a series of diagrams to aid your definition.

b. Examples of where diffusion occurs in biology (add your own examples where possible).

c. Definitions of solute, solvent and solution.

d. A list of the factors which can affect diffusion and the reason these factors affect diffusion.

**Task 2**

Read: <https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/4>

Watch: <https://www.youtube.com/watch?v=g7phKY726X0> <https://www.youtube.com/watch?v=4Eq8rO3fABM>

1. Make notes on the process of osmosis. You must ensure that your notes contain the following key points:

a. A definition of osmosis. You may choose to use a series of diagrams to aid your definition.

b. Explain when no net movement of water occurs in cells.

 c. Explain what happens when plant cells are placed in different solutions.

 d. Explain what happens when animal cells are placed in different solutions.

**Task 3**

Watch: <https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/8>

1. Write a bullet pointed method of how to carry out the investigation.

2. Write down the equation a student would use to calculate the percentage change in mass.

**Task 4**

Read: <https://www.bbc.co.uk/bitesize/guides/zs63tv4/revision/8>

Watch: <https://www.youtube.com/watch?v=AxXN-j6UzOY>

1. Make notes on the process of active transport. You must ensure that your notes contain the following key points:

a. A definition of active transport. You may choose to use a series of diagrams to aid your definition.

b. Explain some examples of active transport that occurs in both plants and animals.