

GCSE Science

AQA Combined Science
(*Trilogy*) & AQA Biology,
Chemistry and Physics

Useful Contacts

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Exam Information

All students will be sitting 6 exams, two for each of the sciences.

| | Biology | Chemistry | Physics |
|--|---|---|---|
| Combined Science (Trilogy) Outcome = 2 GCSE's | 75mins 70 marks 2 papers, each have a 16.7% weighting | 75mins 70 marks 2 papers, each have a 16.7% weighting | 75mins 70 marks 2 papers, each have a 16.7% weighting |
| Separate Science Outcome = 3 GCSE's | 105 minutes 100 marks 2 papers, each have a 50% weighting | 105 minutes 100 marks 2 papers, each have a 50% weighting | 105 minutes 100 marks 2 papers, each have a 50% weighting |

Exam Information

All students will be sitting 6 exams, two for each of the sciences.

| | Biology | Chemistry | Physics |
|---------|--|--|---|
| Paper 1 | Cell Biology; Organisation; Infection and response; and Bioenergetics. | Atomic structure and the periodic table; Bonding, structure, and the properties of matter; Quantitative chemistry; Chemical changes; and Energy changes. | Energy; Electricity; Particle model of matter; and Atomic structure. |
| Paper 2 | Homeostasis and response; Inheritance, variation and evolution; and Ecology. | The rate and extent of chemical change; Organic chemistry; Chemical analysis; Chemistry of the atmosphere; and Using resources. | Forces; Waves; and Magnetism and electromagnetism (<i>and space physics for separates only</i>) |

Exam Information

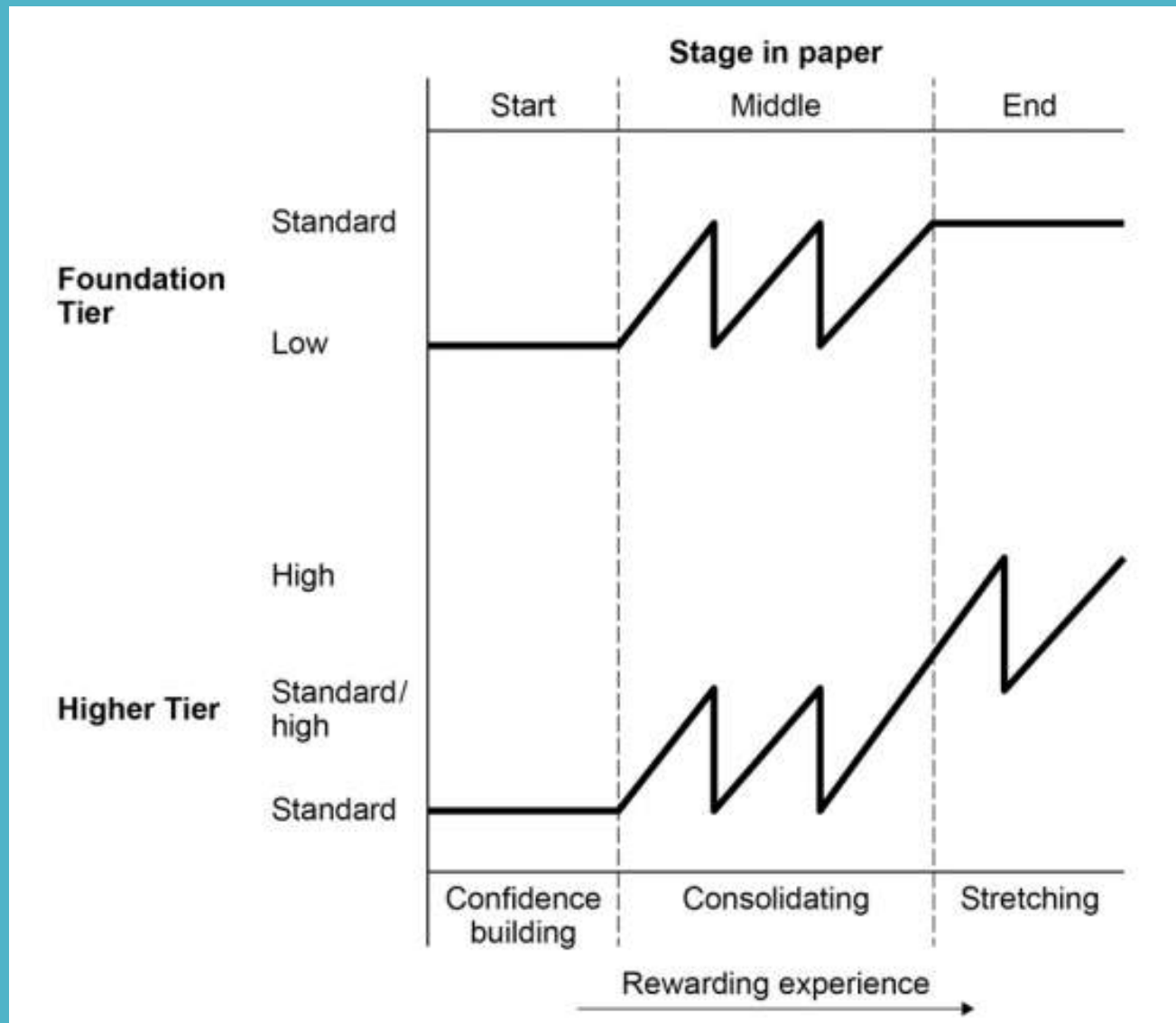
Can you mix and match tiers?

Combined Science – No. You must complete all exams on the same tier.

Separates – No you can not mix between paper 1 and paper 2 for each subject, however, yes you can mix between each subject. E.g. you could do Foundation Biology but Higher Physics and Chemistry.

Foundation Tier – Grade 1 → 5 Or 11 → 55 in Combined Science

Higher Tier Papers – Grade 4 → 9 Or 44 → 99 in Combined Science



Question papers will be ramped and get progressively harder throughout the paper and questions

Available Resources

1) Revision Guides, Work Books and Answer Books

All available from Mrs Stokes in the Library

Combined Science Revision guide = £6.00

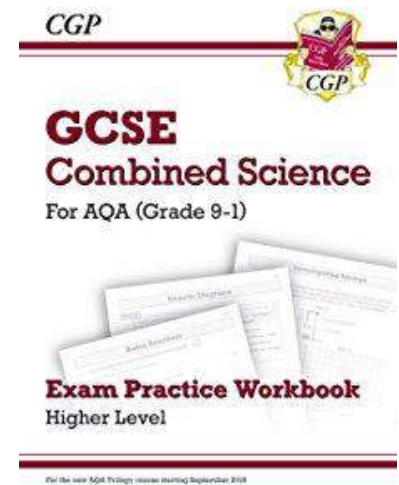
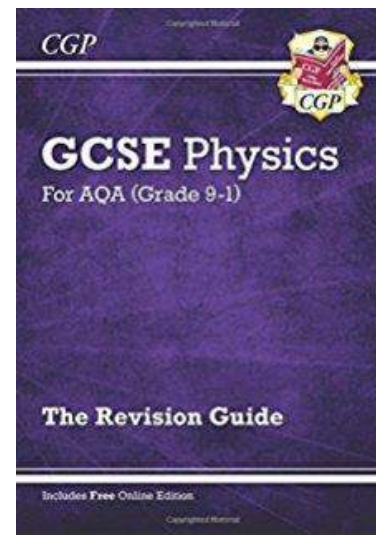
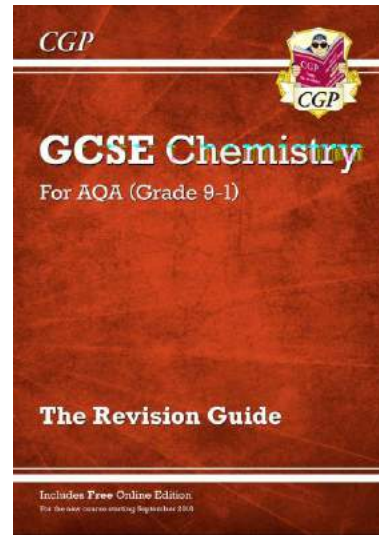
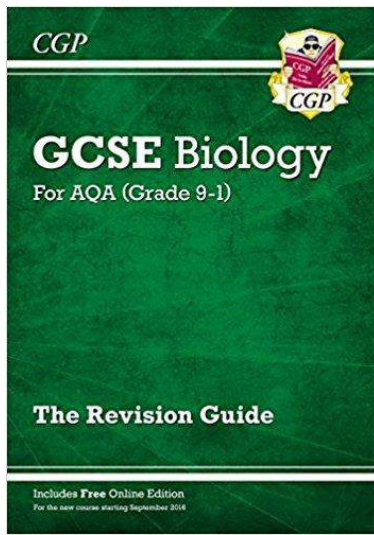
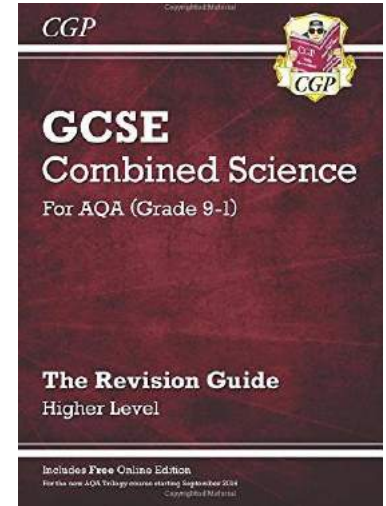
Combined Science Work Book = £6.00

Answer Book = £1.00

Each of the separates revision guides = £3.50

Each of the workbooks = £3.50

Each answer book = £1.00



Available Resources

2) Practical Past Paper Question Packs

One past paper pack available for each of the sciences, for both combined science and separates science courses.

These can either be put onto a USB for your son/daughter or emailed/SMHW depending on size restrictions

They can also be printed, however these will be charged at a cost of £1 per booklet (£3 in total)

Combined Science: Biology Required Practical Past Paper Booklet

Required Practical 1 – Using Microscopes

You can calculate the magnification of an image using the formula:

$$\text{magnification} = \frac{\text{image size}}{\text{real size}}$$

Image size and real size should have the same units. If they don't, you'll need to convert them first (see page 11).

If you want to work out the image size or the real size of the object, you can rearrange the equation using the formula triangle.

Remember to convert from micrometres (µm) to millimetres (mm), you need to divide by 1000 (see page 11).
Eg. 5000 µm = 5 mm

EXAMPLE: A specimen is 50 µm wide. Calculate the width of the image of the specimen under a magnification of × 100. Give your answer in mm.

- 1) Recall the formula.
- 2) Fill in the values you know.
- 3) Remember the units in your answer.
- 4) Convert the units.

Worked Example:

Image size = magnification × real size
 $\text{image size} = 100 \times 50$
 $= 5000 \mu\text{m}$
 $= 5 \text{ mm}$

Remember to convert from micrometres (µm) to millimetres (mm), you need to divide by 1000 (see page 11).
Eg. 5000 µm = 5 mm

If you want to look at a specimen (e.g. plant or animal cells) under a light microscope, you need to put it on a **microscope slide** first. A slide is a strip of clear glass or plastic onto which the specimen is mounted. Here's how to prepare a slide to view onion cells:

- 1) Add a drop of water to the middle of a clean slide.
- 2) Cut up an onion and separate it out into layers. Use tweezers to peel off some **epidermal tissue** from the bottom of one of the layers.
- 3) Using the tweezers, place the epidermal tissue into the water on the slide.
- 4) Add a drop of **iodine solution**. Iodine solution is a **stain**. Dyes are used to highlight objects in a cell by adding colour to them.
- 5) Place a **cover slip** (a square of thin, transparent plastic or glass) on top. To do this, spread the cover slip **across** on the slide, **away** from the water droplet. Then carefully **tilt** and **lower** it so it covers the specimen. Try not to get any air bubbles under there — they'll obstruct your view of the specimen.

Use a Light Microscope to Look at Your Slide

To look at your prepared slides, you need to know how to use a light microscope:

- 1) Clip the slide you've prepared onto the **stage**.
- 2) Select the **lowest-powered objective lens** (i.e. the one that produces the lowest magnification).
- 3) Use the **coarse adjustment knob** to move the stage up to just below the objective lens.
- 4) Look down the **eyepiece**. Use the coarse adjustment knob to move the stage downwards until the image is **roughly in focus**.
- 5) Adjust the **focus** with the **fine adjustment knob**, until you get a **sharp image** of what's on the slide.
- 6) If you need to see the slide with **greater magnification**, swap to a **higher-powered objective lens** and refocus.

Turn over for some practice questions.....

Q1) The image below shows some muscle cells from the wall of the stomach, as seen through a light microscope.

(a) Describe the function of muscle cells in the wall of the stomach.

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(b) Figure above is highly magnified. The scale bar in Figure above represents 0.1 mm. Use a ruler to measure the length of the scale bar and then calculate the magnification of Figure above.

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Magnification = times

(c) The muscle cells in Figure above contain many mitochondria. What is the function of mitochondria?

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(d) The muscle cells also contain many ribosomes. The ribosomes cannot be seen in Figure above.

(i) What is the function of a ribosome?

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(ii) Suggest why the ribosomes cannot be seen through a light microscope.

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(Total 8 marks)

Available Resources

4) Regular assessments

20 minute tests after each topic

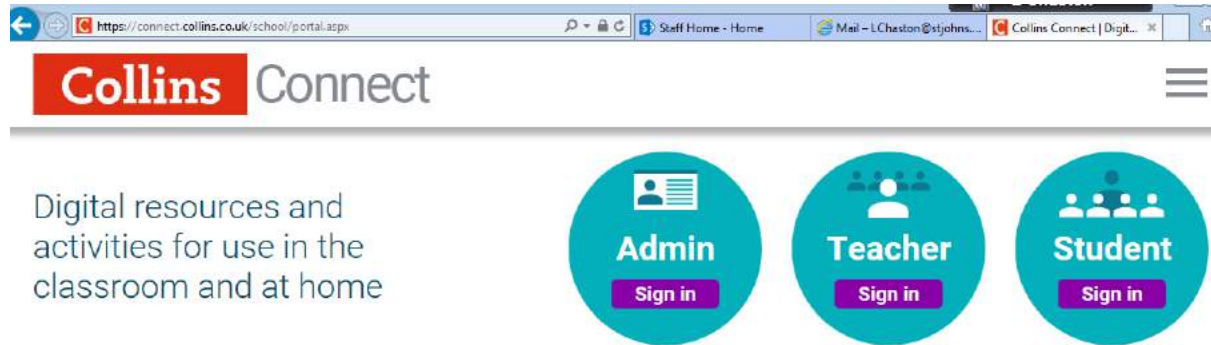
Feedback sheets on each

Mocks

Available Resources

5) Online Text Book

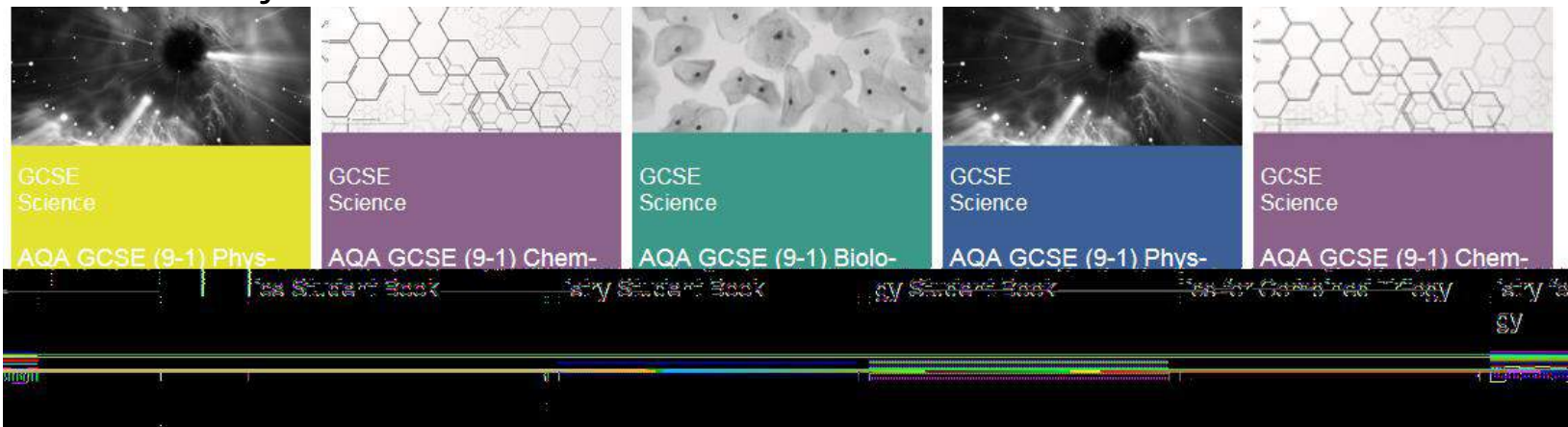
Go to the Collins connect website and select student



School: enter SN8 and select St Johns, Marlborough

Username: stjohns

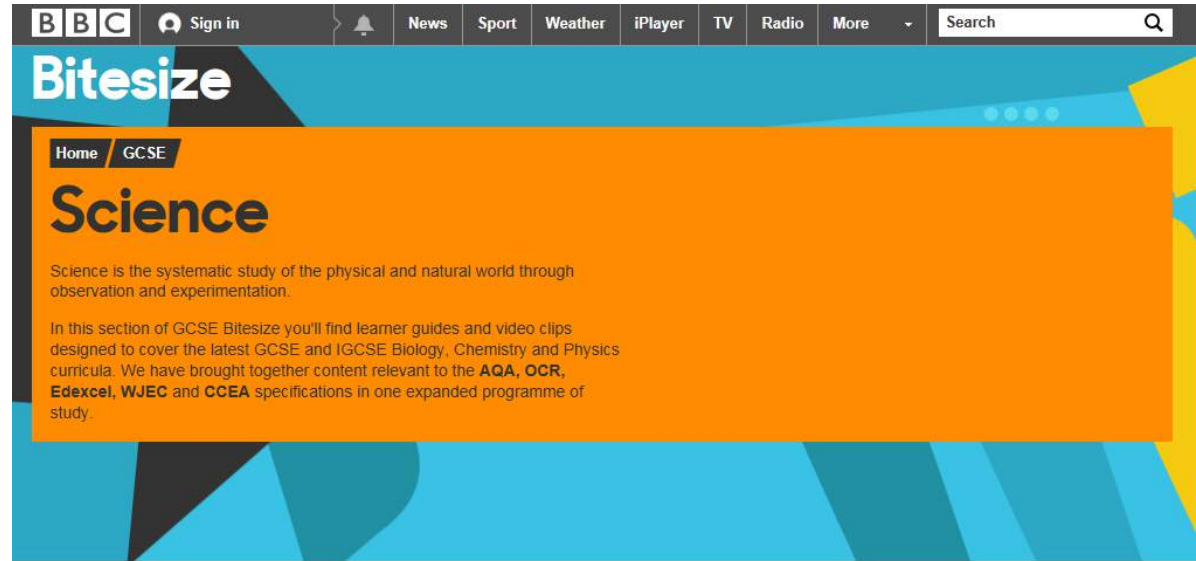
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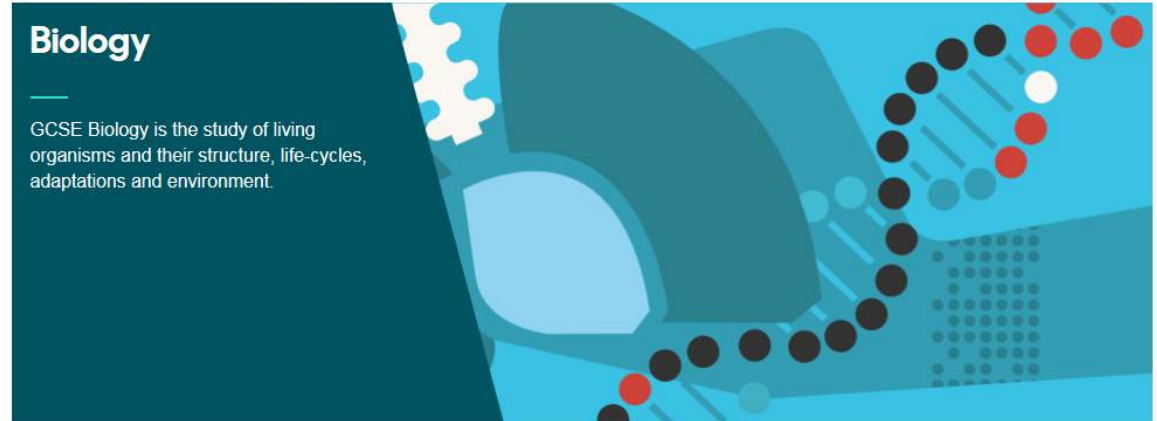
Available Resources

6) BBC Bitesize

Each topic has BBC clips linked, summary notes, animations and quizzes.



The screenshot shows the BBC Bitesize website interface. At the top, there is a navigation bar with the BBC logo, a 'Sign in' button, and links for News, Sport, Weather, iPlayer, TV, Radio, and More. A search bar is located on the right. Below the navigation bar, the 'Bitesize' logo is prominently displayed. The main content area is titled 'Science' and includes a sub-navigation bar with 'Home' and 'GCSE'. The text describes science as the systematic study of the physical and natural world through observation and experimentation. It also mentions that the section contains learner guides and video clips for GCSE and IGCSE Biology, Chemistry, and Physics, covering specifications from AQA, OCR, Edexcel, WJEC, and CCEA.



The screenshot shows the BBC Bitesize website interface for the Biology section. The background features a stylized illustration of a DNA double helix and a gear. The text defines GCSE Biology as the study of living organisms and their structure, life-cycles, adaptations, and environment.

Tips for Trying at Home

Everybody learns differently!

- Distributed practice
- Making a plan
- Not copying
- Rewards for targets
- Auditory
 - Podcasts
 - Recording yourself
 - Talking to friends/ family
 - Teaching others
 - Quizzing each other
- Practice as many past papers as possible!

1. Planned relaxation
2. Short bursts
3. Real rest
4. No distractions
5. Exam practice

'Chunking' Revision

- We have broken down the specification into smaller chunks.
- At the start of each topic there is an assessment grid
- Then a 20 minute test at the end
- These can be used to help prioritise revision

| Lesson title | 9-6 | 5-3 | 2-1 |
|---|--|--|--|
| The Endocrine System | Explain why the pituitary gland is often called the master gland | Describe the endocrine system and define the term hormone Compare actions of the nervous and endocrine systems | Label a diagram of the organs in the endocrine system |
| Blood glucose control | HT: Explain when glucagon is produced by the pancreas and its effects on blood glucose levels | Explain how insulin and glucagon work together to control blood glucose levels | Describe how blood glucose levels are monitored Describe glycogen as a stored carbohydrate |
| Diabetes | Evaluate modern methods of treating diabetes | Explain the causes, treatments and problems associated with type 1 and type 2 diabetes | Compare the causes, treatments and problems associated with type 1 and type 2 diabetes |
| Water and ion changes | Describe how amino acids are deaminated in the liver to form ammonia which is converted to urea for excretion | Explain how the body responds to different temperature and osmotic challenges in terms of sweat and urine release | Describe the effect of too much or too little water on cells (in terms of osmosis) |
| Osmoregulation | HT: Identify the site of production and target organs for ADH | Describe the effects of ADH Explain how ADH controls blood concentration using negative feedback | Label a diagram of the excretory system Describe how urine is produced |
| Kidneys and Dialysis | Evaluate the use of kidney transplants and dialysis to treat kidney failure | Explain why dialysis fluid contains sugar and ions at the same concentration as normal blood but no urea Explain how a kidney machine works | Describe the advantages and disadvantages of a kidney transplant |
| HT: Negative Feedback: Thyroxine and adrenalin | Draw a diagrams to explain how adrenaline and thyroxine are released and how it is controlled by negative feedback | Describe where and when adrenaline is released and its target organs. | Describe the effects of adrenaline on the body. Describe where thyroxine is produced and its effects on the body. |

Final Tips

Literacy – Focus on key vocabulary. Make sure you can define key words and use them correctly to answer questions.

Maths – There is an increased demand for maths in each exam paper. 30% in Physics, 20% in Chemistry and 10% in Biology. Don't forget your ruler, calculator and ALWAYS show your workings out. Equation sheets are provided in physics.

Chemical Formulas – A periodic table is provided with the exams. Use this! Also read the questions carefully, do the examiners want word equations or symbol equations.

Required Practicals – All students are completing key practicals . 15% of the total exam papers will be based on these practical skills. Make sure you revise these. You should know the methods, variables, expected trends and hazards.

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Thank you. Any questions please feel free to contact us or your son/daughter's teachers

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