

## Huntington School: Science Department



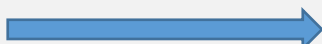
### Curriculum Intent: Key Stage Five Biology

The science department at Huntington School will have a curriculum which creates learners who will thrive in a changing world by giving them the knowledge to:

- Confidently and accurately work scientifically and solve scientific problems;
- Think creatively to overcome and tackle problems with resilience and an open mind-set;
- Appreciate and enjoy the uniqueness of science as a discipline;
- Seek further knowledge and skills independently, based upon a fascination of learning;
- Achieve great exam results that allow our students to progress to the next steps in their lives as scientifically informed citizens.

We will develop this in our students by:

- Using purposeful practical activities with an emphasis on understanding scientific ideas rather than participation.
- Highlighting the relevancy of science to the modern world.
- Assessing pupils starting points and their progress by using effective questioning.
- Creating a true multi- disciplinary approach to science where scientific skills are deployed confidently across all three sciences.
- Using guided practice and modelling to scaffold student's problem solving abilities.
- Being reflective practitioners who constantly evaluate and improve our practice.

<b>Foundations of KS4</b> 		<b>Y12</b> 	<b>Y13</b> 
<b>B2 Organisation</b>	<b>1 Biological Molecules</b> This unit is about the basic building blocks of everything. We cover Carbohydrates, Proteins, Lipids, Nucleotides and Water. Once this foundation is covered we look in more detail at the action of Enzymes and the basic structure and replication of DNA.	Links to this topic: This topic can be linked with every topic covered in the specification.	
<b>B1 Cell Biology</b> <b>B3 Infection and response</b>	<b>2 Cells</b> Cells are what all living things are made of. We look at their structure, how we study them, how they divide and how substances move across their membranes. We then study how the immune system responds to various pathogenic threats.	Links to this topic: This topic can be linked with every topic covered in the specification.	
<b>B2 Organisation</b> <b>B6 Homeostasis and response</b>	<b>3 Organisms exchange substances with their environment</b> Organisms exist within an environment containing things that they need and other things that they need to rid themselves off in order to perform living processes. We focus on the structures that aid their transfer and transport into and around organisms.	<b>6 Organisms respond to changes in their internal and external environments</b> How organisms react to stimuli both external and internal is covered here. The control, both hormonal and nervous is looked into in greater detail than that of GCSE here. Then we look at how sugar and water levels are maintained in the blood.	
<b>B4 Bioenergetics</b> <b>B7 Ecology</b>	A basic reminder of the bioenergetics of photosynthesis is given in year 12 in the cells unit.	<b>4 Energy transfers in and between organisms</b> Here we look at how the energy is transferred both, within the mitochondria and chloroplasts of organisms and between those organisms themselves. The nitrogen cycle also features here	
<b>B6 Inheritance, Variation and Evolution</b> <b>B7 Ecology</b>	<b>4 Genetic information, variation and relationships between organisms</b> This is where the foundation of the function of DNA at a cellular and organism level is laid. We look at cell division and how the resulting variation from meiosis impacts interactions within and between species.	<b>7 Genetic, populations, evolution and ecosystems</b> Here ideas from unit 4 and GCSE are built on as we learn about the frequency of alleles in populations. The dynamics of those populations is studied alongside consolidating knowledge on evolution and thinking about how we can collect data from the environment around us.	
		<b>8 The control of gene expression</b> The pinnacle of the study so far is to think about how our simple biology can effect expression in the phenotype. We then go on to look at how this can be used and manipulated by humans to solve other challenges and problems.	
<b>CPAC</b>	The assessment of practical skills is a compulsory requirement of the A-Level Biology course. Students will complete a minimum of 12 required practical activities covering all the required practical techniques and apparatus as outlined by the specification. Teachers will assess these practical activities using the Common Practical Assessment Criteria (CPAC). Students will be assessed on the following; 1a – following written procedures 2a – Correctly uses appropriate instrumentation, apparatus and materials (including ICT) to carry out investigative activities, experimental techniques and procedures with minimal assistance or prompting. 2b - Carries out techniques or procedures methodically, in sequence and in combination, identifying practical issues and making adjustments where necessary. 2c - Identifies and controls significant quantitative variables where applicable, and plans approaches to take account of variables that cannot readily be controlled. 2d - Selects appropriate equipment and measurement strategies in order to ensure suitably accurate results. 3a - Identifies hazards and assesses risks associated with those hazards, making safety adjustments as necessary, when carrying out experimental techniques and procedures in the lab or field.		

	<p>3b - Uses appropriate safety equipment and approaches to minimise risks with minimal prompting.  4a - Makes accurate observations relevant to the experimental or investigative procedure.  4b - Obtains accurate, precise and sufficient data for experimental and investigative procedures and records this methodically using appropriate units and conventions. 5. Researches, references and reports  5a - Uses appropriate software and/or tools to process data, carry out research and report findings.  5b - Cites sources of information demonstrating that research has taken place, supporting planning and conclusions.</p> <p>Students will have to keep their own record of the practical activities completed and students who demonstrate the required standard will be awarded a “pass” grade for their practical work. Practical work is also assessed in the three written exams.</p>
<b>Assessment</b>	<p>Students will experience a variety of different assessment techniques during the A-Level. They range from formative assessment during lessons – making use of whiteboards, quick quizzes, questioning and other written activities.  Summative assessment will take the form of end of topic tests, re tests and practice mock papers.</p>
<b>Feedback</b>	<p><b>Verbal feedback</b> is recognised as having the greatest impact on student progress and will be at the core of our everyday teaching in Science at all key stages.</p> <p>Students will usually receive immediate verbal feedback on their contributions, ideas and questions in class. Verbal feedback is often given <i>whilst</i> students are completing tasks, students will usually act on this feedback and improve their work immediately, and therefore there is no need for it to be recorded. Students may also receive immediate verbal feedback on their performance on short formative tasks such as mini-quizzes. Verbal feedback can be given on an individual, small group or whole-class basis.</p> <p><b>Other in-lesson feedback.</b> In science, students will receive feedback on short activities/tasks/quizzes/their Extended Learning (homework) frequently from lesson to lesson. Frequent use will be made of self- or peer- marking as an efficient method of students receiving immediate feedback and improving their work/knowledge/understanding.</p> <p><b>Teacher feedback on specific tasks.</b> Students will be provided with feedback from their teacher on their performance on specific tasks. This feedback could take many forms, again including (but not limited to) this list. This feedback will <u>always</u> provide guidance on how students’ work, knowledge or understanding can be improved and/or what students need to do next to make more progress. This feedback may also identify strengths/weaknesses in students’ work, if appropriate to the task.</p> <p><u>Y12/Y13</u>  At least 3 formal tests/mock exams per year in each Science A-level</p> <p><b>Student responses.</b> Students are expected to act on all feedback. DIRT (Dedicated Improvement and Reflection Time) may be given in lessons for students to improve/correct/re-attempt their work or to complete tasks set in response to their identified areas of need. It should be clear that students’ work, knowledge or understanding has improved as a result of the feedback given. Automatic feedback on Teams will also be used to ensure that students receive effective and timely feedback.</p> <p><b>Teacher feedback on tests/exams.</b> Students will be provided with detailed feedback on formal tests, end of year exams and mock exams. This feedback could take many forms, including (but not limited to):</p> <ol style="list-style-type: none"> <li>marking and annotations on test papers</li> <li>written feedback addressed to individuals, small groups or on a whole-class basis</li> <li>verbal feedback addressed to individuals, small groups or on a whole-class basis</li> <li>re-teaching of specific science content, in response to areas of need identified during the marking process</li> <li>use of mark schemes or other written resources (e.g. model answers) which provide feedback on how to improve specific answers and/or describe common mistakes/misconceptions</li> <li>feedback grids to identify areas of strength and weakness and/or guide students to reflect on their performance</li> </ol> <p>Test feedback in science will <u>always</u> (i) identify (or allow students themselves to identify) areas of strength and weakness, and (ii) provide guidance on how students’ exam responses can be improved and/or what students need to do next to improve their exam responses/performance in the future.</p>
<b>Homework</b>	<p><i>Frequency:</i> Homework tasks will be set on a weekly basis. Students are encouraged if they find a task challenging to seek support from their teacher.</p> <p><i>Types of tasks:</i></p> <ul style="list-style-type: none"> <li>▪ Reinforce and extend learning in class e.g. to practise examination questions.</li> <li>▪ Research in preparation for future tasks e.g. research properties of chemical elements, the applications and implications of using stem cells.</li> <li>▪ Embed key subject content in long term memory, e.g. the formulae for calculations.</li> <li>▪ Practise and develop skills e.g. review and annotation of class notes, graph plotting, identifying patterns, drawing conclusions, answering past exam questions.</li> <li>▪ Extension of learning from the lesson e.g. comprehension questions related to key learning.</li> <li>▪ Review learning by producing mind maps, revision cards etc.</li> <li>▪ Learning and revision for class tests and examinations.</li> <li>▪ Improvement and use of DIRT time to improve or develop set tasks.</li> <li>▪ Wider/topical reading &amp; summarise - around the subject.</li> </ul>

**How can I support my child at home?**

- Asking them about what they are learning
- Encouraging them to consolidate their notes as they go along
- Encouraging them to complete extended learning using their classwork
- Encouraging them to ask for help when they are stuck
- Encouraging them to produce revision resources as each topic is completed.
- CGP Revision resources; revision guide, workbook, pre-made flashcards. These can be purchased from the department.
- Helping them with homework tasks, especially quizzing them during revision extended learning.
- Encourage them to watch the news and discuss real-life applications –medicines, industrial applications.