KS3-4 Biology Curriculum Intent

The Science curriculum is designed to foster a curiosity about the world around us, enable citizens of the future to understand and explore the world effectively and to be able to use scientific principles to both answer and ask questions about the universe and everything in it.

Our intent is that our curriculum

- inspires a love of learning and curiosity about the world
- ensures students understand the second greatest advance in the history of humanity – the scientific method – and can apply this process to questions they might ask
- develops the practical knowledge and skills to use scientific equipment safely and accurately to competently test ideas and demonstrate phenomena
- fosters a sense of awe in the beauty of our universe and how we can work together (or individually) to deepen our understanding of ANYTHING
- informs knowledge of the key workings of the human body so that educated opinions and decisions can be made about health, products and stories in the media
- develops analytical skills to scrutinise data presented in any format to draw out meaning
- combines basic Maths and English skills in context to help students develop their application skills
- informs students of issues facing themselves and the wider world to help this future generation look after themselves and their planet
- ensures students leave GHS able to critically analyse and evaluate data, stories and phenomena in everyday situations
- improves transferable skills such as time-keeping, teamwork and organisation
- develops students learning skills and independence so they can go on to be life-long learners
- makes students more employable so they become a self-sufficient and productive member of society
- delivers opportunities to apply the skills learnt in the form of a wide range of practicals.
- helps students develop logical thinking and problem-solving skills
- teaches students how to be safe and evaluate risks in everyday life and in particular scientific contexts

Key Stage Three Science encompasses a wide range of Biology, Chemistry and Physics topics. We follow the Activate Science Curriculum to enable our students to follow a spiral curriculum up to GCSE.

Students have 3 lessons a week from Year 7 through to Year 9. In year 10 to year 11 students have 6 lessons a week.

Biology Programme

Year 7

B1, chapter 1, 'Cells' links to students' previous ks2 knowledge on living organisms by going into further detail regarding living organisms, from the basic building blocks i.e. cells to their organisation into tissues, organs and organ systems. Unicellular as well as multicellular organisms are also covered.

Chapter 2 'Structure and function of body systems' is a continuation of learning about the human/animal anatomy, in ks2 the students learned the names of organs and the basic functions in relation to the circulatory system e.g. heart, blood vessels etc… In yr7 students learn regarding the circulatory system in more detail as well as explore other systems present in the animal anatomy. Examples of this include the gas exchange system. Muscles and bones are also covered in this chapter which links to the previous topic as cells, and tissues are what makes the human skeletal.

Chapter 3 'Reproduction' looks at the male and female reproductive system in humans and explores the journey of conception to birth. Plant reproduction is also covered, including the structure of flowers and the process of pollination. Different methods of pollination are taught and students are expected to compare the different methods.

Year 8

B2, chapter 1 'Health and lifestyle' builds up on the ks2 knowledge on 'diet'. Students are required to understand what a balanced diet is as well as the consequences of an unbalanced diet. The addition of mathematical concepts and calculating results extends their knowledge on analysis and evaluation. The effects of recreational drugs are also explored in this chapter.

Chapter 2 'Ecosystems processes' introduces photosynthesis and is linked to B1, chapter 1, by going into further detail on how cells receive energy as students expand their knowledge on respiration but this time in plants. Photosynthesis is introduced which expands their knowledge on plants from 8B explores the wide variety of living organisms and how they're adapted to their environment. This topic goes into detail regarding the abiotic factors of living organisms, which links to the previous topics as abiotic and biotic factors is what makes an ecosystem.

Chapter 3, 'Adaptation and inheritance' links to previous ks2 knowledge on inheritance, students get a deeper insight on why parents and their offspring vary and are not identical to their parents.

Year 9

9A 'Genetics and Evolution' is a continuation of 8B, this unit recaps ideas about the causes of variation and then looks at inherited variation in more detail. DNA is introduced and students consider how inherited genes can affect an organism's survival.

9B 'Plant Growth' links to 8C

9C Is a review of all the topics learnt in ks3 with the addition of the 'working scientifically' component in which students use their knowledge to evaluate, analyse, predict etc.…

9D 'Biology Transition into GCSE'S' utilizes the context of disease to introduce certain topics that will later on be developed in their GCSE'S. Ecology will be covered which links to their previous knowledge in 7D on 'ecosystems'. Osmosis will be introduced also which links to diffusion in 8C 'breathing' as osmosis is a type of diffusion.

Year 10.
Unit 1 'Organisms and Life Processes' revisits the topic on life processes which was previously covered in 7A as well as the variety of living organisms which again was covered in 8B 'classification and biodiversity'.

Unit 2 'Animal Physiology' links to 8C where gas exchange is covered in more detail, and coordination/chemical coordination is covered which links to 9D. The same topics are being taught, with further in-depth information and understanding behind these topics.

Unit 3 'Plant Physiology' covers reproduction in plants, which links to previous knowledge learnt in 8B. There is also a link to Unit 2 as students expand their knowledge on coordination by learning how plants coordinate.

Unit 4 'Ecology and The Environment' links to 7D and 9D and goes into further detail.

Unit 5 'Variation and Selection' links to the topics covered in 9A with the addition of the topic on 'Selective Breeding',

which links to a different type of breeding previously learnt on 'natural Selection' in 9A.

Unit 6 ‘Microorganisms and Genetic Modification’ links to unit 5 on the topic of selective breeding, as students explore the differences between genetic engineering and selective breeding.

Year 11

This unit on 'particle theory' in year 11 continues the themes introduced in KS3 chemistry 'the particle model' and physics 'energy transfers' by including the gas laws, pressure in liquids, and absolute zero.

'Magnets and electromagnetism' builds on KS3 topics of 'forces', 'force fields' and 'electricity' by including Fleming's left hand rule to understand motors, uses of electromagnets, and transformers.

'Radiation' also builds on the themes introduced in KS3 of 'particles' because radiation such as alpha, beta are particles; 'energy' because gamma is pure energy and it is by virtue of the particle motion that their energy is dangerous; and 'energy transfers' through ionising the medium that these particles travel through.