Science

Curriculum Intent 2024-2025

Our Aim:

- To offer a high-quality Science education that develops the scientific knowledge and skills laid out by the National Curriculum, and at KS5 by AQA, to allow students to develop a further understanding of the impact of science in the world around us.

This is a working document and as such will be subject to changes as it is continuously reviewed.

National/horizontal alignment:

- By the end of year 9, all students will have had the opportunity to meet all the learning outcomes stated by the National Curriculum, in line with students across the country
- By the end of year 11, all students will have had the opportunity to meet all the learning outcomes stated by AQA
- By the end of year 13, all students studying a Science will have had the opportunity to meet all the learning outcomes stated by AQA

Vertical alignment:

- Our Key Stage 3 curriculum has been designed as a spiral program of study to allow students to build upon their knowledge of our "big topics" throughout their education. These include Enquiry processes, Forces, The Earth, Energy, Electricity and Magnetism, Matter, Organisms, The Periodic Table, Chemical Reactions, Genes, Ecosystems and Waves
- Our Key Stage 3 curriculum builds on the knowledge and skills students gained in Key Stage 2. Students are continuously assessed formatively to influence planning after their arrival from Primary School to ensure content is challenging and that students have the opportunity to meet the specified outcomes.
- Each topic within the program of study is logically sequenced so the knowledge and skills gained prepares students for what they will be learning in the next lesson, topic, year or Key Stage.
- The Key Stage 3 outcomes allow a firm understanding of the basic skills and knowledge for Key Stage 4 to build upon
- For Key Stage 4 and 5 we follow the specification as created by AQA. This means that students get the breadth of topics students should study to help bridge the gap between GCSE and further education
- Our Key Stage 5 curriculum allows us to cover topics that students will need to carry their education into University

Subject alignment:

- All teachers follow the programme of study and have access to the same lessons. The resources are continuously changed to ensure they are the highest quality possible. This means all students have the opportunity to meet comparable learning outcomes
- All students are assessed on the same knowledge and skills so progress can be tracked, and it can be used to inform our teaching of individuals, classes and cohorts. These assessments include quizzes, extended writing, practical write ups and exam questions.

Interdisciplinary alignment (based on Curriculum intent statements Spring 2022):

Geography	• Year 7 Geographers study waste management, recycling and human effects on the environment. We then build on this in our Earth topic and hope to use their "upcycle" projects from Geography as the starting talking points of our topic which more heavily focusses on the limited resources we have • Geography leave the teaching of geology to Science so we are not repeating content • Year 8 Geographers study climate change. We link the knowledge they have already learned into our lessons on combustion. We set a pre topic assessment before the Earth climate change topic to ensure we are not reteaching content they are already competent with. • Year 9 Geographers cover Pandemics and diseases. They look at Ebola, Covid-19 and malaria too. Our content on communicable diseases builds upon this • Year 10 and 11 look into energy resource management including water which links into our Using Resources topic in Chemistry • Year 10 students look at ecosystems which we build on in the Ecology topic of Biology in Year 11 • Year 11 Geographers study climate change which builds on from some of the content we complete in Year 9. We build on their additional knowledge from Geography during revision sessions in Year 11 Chemistry.
Physical Education	• Year 7 students learn the major muscle groups and bones and we build on this in year 9 • Year 8 students investigate the effect of exercise on heart rate and breathing rate which we build on with respiration • Year 10 PE students study red and white blood cells, the respiratory system, alveoli and the cardiovascular system. This builds on from the organisation topic we complete in Year 9
Mathematics	• Mathematical fluency and confidence in numeracy are a vital part of science and it features heavily throughout our Key Stage 3 curriculum • Year 7 students look at simplifying and manipulating algebraic expressions, tables, charts, calculating means, understanding and using percentages and standard units of measure all of which we consistently reinforce throughout our Key Stage 3 Curriculum • Year 7 students look at area and volume which we build on when doing density calculations • Students look at standard form in year 8 which we then use in year 9 • In year 9 students look at probability and tree diagrams. We teach punnet squares in Year 8 so help to develop these comparable skills earlier. • Year 10 students look at standard form, algebraic equations, straight line graphs, simultaneous equations and presentation on data. We build on this throughout the sciences using standard form in biology and chemistry when talking about cell and atom size. Physics use simultaneous equations when using kinetic energy equations with gravitational potential energy equations. • Year 11 students continue to build on tables, charts and graphs which we revisit consistently through KS4 science. • Mathematicians in year 11 convert metric measurements which we do throughout KS3 and KS4 • Year 10 and 11 mathematicians need to be able to draw scale diagrams. We use this skill when students have to resolve forces in Physics
PSCHE	• PSHCE topics covered vary based on what is needed to be covered by our school. • Topics on drugs, vaccinations, sexual health have, in the past, all been planned by Science teachers to ensure they are in alignment and build on the content done within lessons
Literacy/English	• All topics include suitable reading comprehension and extended writing tasks • Pupils are supported in their use and spelling of Key Scientific terminology

	• Key words are highlighted at the start of each lesson • Pupils are provided with knowledge organisers to use as a reference

Assessment:

Year 7-13 students will be assessed throughout the year through summative and formative assessments

- Formative assessments are more diagnostic than evaluative and allow us to monitor pupil learning style and ability, to provide ongoing feedback and allow us to improve and adjust our teaching methods to help students progress. These may take the form of, but are not limited to:
    - Questioning in class
    - Impromptu quizzes
    - Prepare for Learning and Review Activities
    - Monitoring of class work and homework
    - Peer Review
    - Self-Assessment
    - Specific teacher marked tasks
- Our summative assessments aim to evaluate student learning and academic achievement. These assessments will also allow us to provide feedback and help improve the students progress throughout their education at All Hallows.
    - These assessments in Key Stage 3 will take the form of:
        - Two synoptic assessments
        - Educake homework quizzes
    - Key Stage 4:
        - Year 10 will do three synoptic assessments
        - Year 11 will do two synoptic assessments
    - Key Stage 5:
        - Key Stage 5 students will do two synoptic assessments