

Science



Aims:

- To teach students a love of science through a variety of engaging, creative and motivational lessons by teaching both project based learning and stand-alone science lessons, providing opportunities for a hands on application of knowledge and skills.
- To use big ideas and mastery goals to equip all of the students for the future, providing students with the ability to connect concepts, ensuring that they can see the world analytically, explain phenomena and make predications
- To ensure that all students will gain the appropriate base-level and beyond understanding to access the AQA GCSE science curriculum

Content:

Our curriculum is based on the AQA KS3 syllabus, ensuring that students are taught the skills and knowledge to access the KS4 GCSE science curriculum. The aim is to re-explore and develop a range of modules that students have been introduced to in year 7 and 8 across the following themes of: Forces, Electromagnets, Energy, Waves, Matter, Reactions, Earth, Organisms, Ecosystems and Genes. These 10 themes focus on core aspects of the GCSE curriculum enabling a solid base for students to build upon when they reach GCSE level. Once the 'core' modules have been taught in Year 9, students will focus on developing areas of their knowledge of biology, chemistry and physics through application in relation to: new technology, key turning points in science and the use of skills in detection.

Curriculum Map

| Year | Term | Curriculum | Assessment |
|------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 9 | Term 1 | Students will study a range of Biology, Chemistry and Physics topics. Topics within term 1 include Pressure, Heating and Cooling, Types of reactions, photosynthesis and respiration | Formal Exam style assessments, knowledge recall and creative extended learning pieces and retrieval quizzes in lessons. |
| | Term 2 | Students will study a range of Biology, Chemistry and Physics topics. Topics within term 2 include Breathing, current and interdependence. Students will then move on to develop areas of knowledge through the application of content in relation to new technology, key turning points in science and the use of skills in detection. | Formal Exam style assessments, knowledge recall and creative extended learning pieces and retrieval quizzes in lessons. |
| | Term 3 | In the study of new technology students will develop an understanding of the science and consider the ethics of how we use this new technology. Turning points in Science provides the opportunity to celebrate the contributions of famous, and some less famous, scientist including the role of women. In the study of detection students will learn how scientific evidence is gathered and the importance basing our opinions on evidence. | Formal Exam style assessments, knowledge recall and creative extended learning pieces and retrieval quizzes in lessons. |

Assessment:

Within each topic we will explore student's ability to work scientifically providing opportunities for students to develop skills in analysis, communication, enquiry and problem solving. We will also provide opportunity for students to engage in practical activities to demonstrate their practical skill and apply knowledge acquired.

To promote individual progress within the classroom, students will be encouraged to self-assess and test each other through peer assessment to develop their own understanding. Teachers will use a variety of assessment methods to



monitor this progress. This will include formative and summative assessment in the form of small topic tests, assessed written work, presentations and practical skills assessment.

Extended Learning:

Extended learning in science draws from both Mode A and Mode B types. Mode A extended learning is where the extended learning focusses on knowledge recall and Mode B is where the students are invited to express themselves creatively to succeed at a challenge. There will also be lots of opportunity for students to engage with science outside of the classroom through the wealth of enhanced curriculum provided at the John Taylor Free School. This includes participating in the STEAM club (Science Technology, Engineering, Arts and Maths) and attending science educational visits.

Connection to the JTFS Approach

| Whole School Theme | How does Science support this? |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STRIPE | Modules within the year help to address the key driving questions of the STRIPE curriculum and encourage students to use this knowledge to aid their other subjects. STRIPE habits are used constantly within science with particular reference to team player during experimental teamwork and the reflective and resilient strand where students are encouraged to reflect and refine their methodology. Students are also constantly encouraged to be innovative when designing their investigations |
| STEAM | As science is one of the key strands of STEAM, we focus on many opportunities for students to connect their learning to other subjects. We also focus on job opportunities and possibilities that exist for students. The modules of study towards the end of the year focus on applying this knowledge to the skills of detections focusing on job opportunities through crime detection such as DNA and fingerprint analysis |
| Literacy | Throughout each module, students are encouraged to write like a scientist. This includes learning many new science specific words and using them appropriately within their work. Students are provided with literacy template for writing up correct scientific methodology and are encouraged to self-reflect and peer-reflect for spellings, punctuation and grammar prior to submitting work. |
| Numeracy | Students are encouraged throughout this module to relate the content that they study to the skills they have learnt in maths. Modules in pressure and current encourage students to rearrange equations, convert figures and perform complex calculations. |
| SMSC, British Values and Citizenship | Students debating the ethical issues surrounding current issues. This develops a sense of how citizens can influence decision making through the democratic process by considering the way in which controversial scientific techniques are approved. Looking into the future options for the production of electricity, alternative fuels, and methods to reduce pollution with discussion of how these can improve people's lives and the environment in general. Discussion on the impact of wind turbines also develops British Values such as student's sense of respect for others in the community. Students investigating the historical impact of scientists from around the world in numerous famous discoveries. Students considering how scientific perceptions can alter due to the development of new technologies. Students will consider local issues that develop British values, such as light pollution in Astronomy or Recycling in Chemistry. |