



Science department curriculum statement

Intent:

When looking at our intent as a department we began by looking at the school mission statement as developed by our governors. As a department we aim to foster high aspirations and determination in our pupils, driving them to be high achievers in all aspects of learning and development. We intend for them to be confident in their ability in science and equip them to achieve excellence in their studies leading to success in continuing education or training and future careers. We teach that science and faith can go together, and where possible show the links between the two by studying catholic scientists and celebrating our Patron Saint for natural science: St Albert the Great.

The study of science is essential for every pupil because science has changed our lives in every way and is vital to the worlds' future prosperity. As pupils learn about science, they also learn about its uses and significance in society and their own lives. This will highlight the significant contribution science has made in the past. For example, eradicating smallpox and developing penicillin. Pupils will also learn about the continuing importance of science in solving global challenges such as climate change, food availability, controlling disease and access to water. Science is in everyday life, and it is important that pupils have the ability to understand what is happening in the world around them. This enables them to be able to make informed decisions regarding for example health decisions, nutritional decisions, understanding the impact of global warming or different sources for producing electricity. We encourage pupils to be able to explain what is happening, predict how things will behave and analyse causes in order to be more aware of what is happening around them.

Our intent is to provide a science curriculum that is accessible to all pupils, which engages them in their learning and ignites a curiosity of the world in which they live.

Implementation:

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. When mapping out our seven-year curriculum we started at the beginning. What does the KS2 national curriculum look like, what should the pupils already know when they join Y7 and how does this link to the KS3 national curriculum. The Ofsted research review highlighted the variability in the delivery of science at primary school, we endeavour to welcome the pupils to KS3 and develop their practical skills along with their knowledge of processes in Y7. As a department we have looked at the KS2 curriculum and refer to it when teaching KS3 where appropriate. For KS4 we build upon the knowledge taught at KS3 and deliver the AQA Combined Science Trilogy course, and the AQA Triple science course to approx. 25% of each year group. At KS5 we offer Biology, Chemistry, Physics and Applied Science AQA A Levels.

At KS3 we follow all aspects of the national curriculum and lay down the building blocks of these topics for further development of KS4. Subject specialists have planned the route through their curriculum to ensure that material is taught in a logical order which

allows links to be made throughout the years and to ensure that topics are revisited regularly from Y7 through to Y13. For example, in KS2 pupils learn about specific organs in the body, in Y7 we break that down further to learn about the cells that make up the organs and the body, in Y8 we then link back to KS2 again to develop the understanding of the digestive system which leads into Y9 and the transport of substances around the body and within the cells of the body. Y10 then links digestion and transport with respiration, Y11 builds on this in terms of controlling blood glucose levels and in Y12 pupils will learn that cells have further subcellular structures and learn about the cell membranes in depth to see how substances are transported in and out. All throughout is the importance of the understanding of cells. In Chemistry in KS2 pupils learn about properties and changes of material, in Y7 we look at what makes up those materials, in Y8 pupils then study compounds, in Y9 how elements are arranged in the periodic table and then in Y10 and 11 how these atoms make compounds in terms of the different types of bonding. Again, all throughout an understanding of the atom is required. In Physics we develop the topic of electrical circuits. In KS2 pupils are introduced to basic component symbols and learn how to construct simple circuits enabling them to understand their function recognizing the role of conductors and insulators. In KS3 we link back to this as we evaluate the relationship between the brightness of a bulb with the number and voltage of cells used in a circuit. The next step is practically investigating how current, voltage and resistance change in series and parallel circuits. In KS4 we learn how to complete simple multistep calculations for different types of circuits and relate this to different components and their uses. By KS5 we are completing complex multistep calculations performing circuit analysis and linking the principles of charge flow to different contexts.

We have introduced knowledge organisers and low stakes testing to help pupils become secure with memory recall. Our half termly key pieces are based on revisiting prior knowledge and focus on the important practicals and providing effective feedback from assessments.

Our curriculum is ambitious for all pupils. Our SEND pupils follow the same ambitious curriculum as all other pupils and are set according to their ability. These pupils are known to staff and our SENCo provides strategies that staff can use to enable pupils to make progress. Lessons are planned to enable all pupils to make progress, scaffolding is used where appropriate.

As highlighted in the Ofsted research review disadvantaged pupils often struggle to make the same amount of progress in science. Staff know who the disadvantaged pupils in their lessons are and again pupils are set according to their ability. We are using the EEF Improving Secondary Science Education report, along with the Ofsted research review to inform our department improvement plan to continually improve our science teaching as we know that better teaching for all will improve all of our pupils progress.

In science there is a large amount of knowledge that is required to be taught, we deliver this in a carefully planned order, we aim to avoid overload by breaking topics down and interleaving them through the curriculum plan. We teach literacy throughout the curriculum by specifically teaching new vocabulary, often using the Frayer model and we spend a lot of time pulling apart the wording of questions to ensure pupils

understand what is being asked of them. As a department we have planned resources to use during DEAR time to build up the amount of subject specific reading material that our pupils are exposed to. We deliver numeracy throughout our curriculum, enabling pupils to carry out relevant calculations and providing answers in set formats e.g. two significant figures, production of tables and graphs from their own data or data provided and then the ability to analyse their data. Throughout all of the knowledge there are key concepts in science that we deliver: development of scientific thinking, experimental skills and strategies, analysis and evaluation skills, and scientific vocabulary, quantities, units, symbols and nomenclature. These make up the working scientifically skills.

As part of our long-term plans, we have planned for the delivery of interesting career pathways once a half term in our lessons. Our intent is that pupils will be more aware of the wide-ranging possibilities there are for careers in science both locally and further afield. We teach British values throughout our curriculum and again these are planned for delivery to provide more depth to a current teaching topic or to revisit a prior lesson.

Impact:

As a department we strive to enable all of our pupils to reach their potential, through a combination of excellent teaching, engaging lessons, constructive feedback and high standards. In lessons pupils are continually challenged to produce their best work and to act on feedback to improve their work. One of the impacts we intend to see is a continued and sustained improvement in outcomes which match the ability of the specific pupils.

When our pupils leave us, we aim for them to have enjoyed their science experience and have an awareness and understanding of the World in which we live. Science surrounds us on a daily basis, it has improved all of our lives. Our pupils will be able to make informed decisions on for example, their nutrition, their health, their energy supply, their impact on the world in which they live in terms of carbon emissions, packaging, pollution and many more. They will be able to understand what they see in the news and engage in discussions with their peers.

Many of our pupils progress in their science education beyond KS4 to take up any of the four A Levels offered and beyond. Osteopathy, nursing, nuclear engineering, pharmacy, medicine, automotive engineering, construction and project management, biomedical sciences, biology, forensics science, sport science and physics have been the university choices of those pupils who have studied A Level with us.