



Queen Elizabeth's

— ACADEMY —

Curriculum Rationale

Science



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Part of
Diverse Academies

 THE CHURCH OF ENGLAND
Diocese of Southwell & Nottingham

Introduction

The science curriculum at Queen Elizabeth's Academy is designed to develop our students into citizens who have the knowledge needed to understand the phenomena they see in the world around them. By gaining a deep, broad understanding of science, students are able to have a sense of wonder when they see the natural world and are able to fully engage with the environment in which they live, the ability to question why, ask for truth and transparency in information. The powerful knowledge we teach allows students to understand science in the news and be aware of the implications of what they hear and read in the media for themselves and others. They can make informed decisions about their health based on what they learn in our lessons, and we aim to inspire all students for a love of learning. Our curriculum allows students to understand how to look after the world they live in and to become people who can discuss important issues that arise with confidence as they are well informed.

Christian Distinctiveness

In science learning without limits means that every student has access to the knowledge we believe is needed to feel part of the world around them. We teach empathy through consideration of ethics as students learn about genetic engineering, embryo screening and fertility treatment, we discuss science in the news such as in dealing with energy costs, using resources and recycling of materials.

In practical work students work in groups and practice togetherness by helping each other to succeed as they learn experimental techniques and gather data to observe the phenomena that they have learnt the scientific theory behind. Learning about the world around them in our science lessons increases the joy that students can experience in their surroundings, joy matters to us and we take great joy in sharing how the living and non-living parts of our world interact with each other.

Knowledge and wisdom are gained by our students in every science lesson and the knowledge is frequently revisited to ensure it is remembered and built upon to develop a clear picture of scientific discoveries and phenomena.

Knowledge in Science

We follow the National Curriculum, it has been put together by educational experts and covers a broad spectrum of the key ideas across the scientific disciplines of biology, chemistry, and physics.

During Year 7 students are introduced to the concepts and scientific principles that will underpin the learning throughout their education, and throughout the course the knowledge that we teach our students is carefully sequenced by considering prerequisite knowledge for each topic and ensuring that is taught in advance. We collaborate with the mathematics department so that we know when students will have learnt mathematical concepts that are relevant to science and ensure our sequencing reflects this, for example the energy topic at GCSE is taught later in the course than the specification guidance as it has the most challenging calculations, allowing students to develop competence in algebra before attempting these. Students are taught the history of scientific theories including evolution and the development of the model of the atom so they can understand how scientists adjust their theories based on new information and understand the importance of scientific research in ensuring a stable food supply, improving medical treatment and preserving the Earth for future generations.

Within each topic of the curriculum there is an emphasis on practical work, both to engage and motivate students and to develop the key practical skills that will be required to be successful at key stage 4. Students will also practise important processes including using models to explain abstract ideas and graphical analysis.

Our teachers are passionate about science and share stories that are relevant to the topics they teach, from their own life experiences and from their academic study. We share real life examples to increase interest in our topics and to show how relevant they are to our students lives. We want to impart knowledge that students would otherwise not come across. We focus on scientific content that needs to be explained by experts to be fully understood. We make the links between new and existing knowledge explicit for students and use retrieval practice to help students remember what we have taught them. Our topics are interleaved so that the links between different topics are explicit, for example, students learn about specialised cells when they learn cell structure but we return to this knowledge when we teach reproduction and photosynthesis as we refer to the role of specialised cells in these processes.

Careers and Aspirations

In every topic we teach there are careers that the knowledge we are imparting is essential to and we explain this to students. We tell them how engineers use the knowledge of forces that we study to build structures, how technological advancements have been possible because of scientific research into the chemical structures we are learning and explain how medicine has developed through scientific research. Our students have the opportunity to study triple science, which is excellent preparation for scientific A levels and university courses. Students will often express a passion about a particular area of science and we explain how their interests could lead to a particular career or course of study, encouraging students to be ambitious in their future plans. All students, irrespective of their individual pathway, will have the opportunity and knowledge to thrive in modern day Britain, using the fundamental principles of Science to explore and evaluate contemporary scientific issues.