



## Science - Curriculum Intent Statement

### **“I am among those who think that science has great beauty” – Marie Curie**

We understand science to be an intellectual and practical activity. The core aim of our curriculum is to allow the *systematic* study of the structure and behaviour of the physical and natural world.

We recognise that the scientific method is best understood through observation and experiment. We are committed to expanding scientific dialogue and thought. We know that for students to be able to engage with that dialogue and to articulate their thoughts about science we need to prioritise the explicit teaching of reading, writing and communication skills as part of our curriculum design.

Within the science curriculum pathways students can access a variety of qualifications to A level, giving a secure basis to studying science at university and within chosen professions. Our science curriculum allows all students to accumulate the knowledge and skill they need for their future learning and employment.

Our curriculum progresses from the foundations and building blocks of science. The curriculum intends for pupils to eventually develop the intellectual curiosity to allow a grasp of the major schools of thought within science. We allow time to challenge misconceptions and listen to the ideas students bring to lessons.

The biology curriculum begins with the study of the seven processes common to all life and moves through body systems, plant systems and eventually ecosystems. Pupils' knowledge, thinking and skill is developed in sequenced progression from simple biological concepts to more complex interdependent relationships. Underpinning the study of life processes is the development of the idea of a flow of inherited information through living things. As part of our ethos of developing the 'whole person' we intend for the commonality of biological themes to be used as a way of focusing on similarity rather than differences in the biological world.

The level of learning outcomes intended for students of science builds within lessons and across schema. Specific way points are assessed and eventually lead to key end points. Way points include end of topic assessments, homework and data collection points. End of year exams provide important end points to academic years. Our curriculum design intends to support students to develop the literacy skills they need to access assessments and perform to the best of their ability.

Our curriculum maps progress through to year 13, ensuring our ambition for the curriculum is reflected back through the key stages and provides an access route to higher level study of science. The suite of qualifications offered provides nationally recognised end points to our curriculum and specific exam content is built into our curriculum as our key stage 4 and 5 pupil offer.

Consensus of the knowledge and skills students need to successfully reach key end points is achieved and shared through a system of teaching rota, topic fact sheets and key vocabulary as well as exam specifications. We embrace diversity in learning needs and styles and have designed our curriculum so as to acknowledge the right all students have to access its content.

In chemistry the curriculum considers particle arrangement in solids, liquids and gases and then develops through chemical reactions, patterns and predictions in chemistry and environmental chemistry. Atomic structure becomes the cornerstone that allows students to understand matter and how atoms interact and react with each other.

The science curriculum includes a variety of approaches to practical work. Students leave lessons being able to *do more* in a physical sense as well as being able to understand more through curious experimentation.

Practical science acts as part of a sequence of activities to support learning. The purpose of practical activities has been carefully considered within the curriculum sequence and provides experience of the practical investigative skills which are fundamental to the scientific method. Evidence based, critical thinking is an important aim of the science curriculum and our practical work supports theoretical understanding.

Physics is considered from the perspective of seven tenets; electricity, magnetism, forces and space, energy, waves, particles and, atoms and radioactivity. The curriculum is sequenced so that new learning is interleaved with prior learning. Skills and knowledge are revisited and built upon as students move through the curriculum. We know that revisiting knowledge after time helps students to move learning into their long-term memory and in this way they can *know more by remembering more*.

The science curriculum supports the enrichment of student world view, developing the idea that science is not complete. Students consider a broad range of socio-scientific issues including climate change, theories of the origins of the universe, historical context of scientific thinking and the role science can play in improving the human condition. The curriculum recognises the responsibility of science education to the spiritual and moral development of each pupil, through teaching and through example. Extra-curricular opportunities further contribute to the fulfilment of this responsibility.

The demand of the science curriculum on the numeracy skills of students is considered throughout the planning process. Opportunities to teach specific numerical skills and to practice handling of data regularly take place. We consider mathematics to be a language of science explanation and know that for our students to be fluent in that language we must teach and practice number skills.

At GCSE we offer the Combined Science Trilogy qualification and separate science GCSEs allowing students a bespoke route through the curriculum and towards the qualifications which best match their abilities and future aspirations. We are also able to offer alternative programmes of study to students opting for the future pathways route.

A core aim of the science curriculum is to develop scientific vocabulary. Our curriculum supports pupils to read and write about science. We use scientific literacy strategies as part of our support of whole school literacy. Reading and writing about science are key skills in our curriculum. As knowledge content increases in our curriculum, vocabulary becomes increasingly important and demanding. Account is taken of this in the way activities and concepts have been sequenced. We scaffold the vocabulary we use across the curriculum so that students can access content and assessments.

All pupils at St Pauls Catholic School have a right to access the science curriculum and for that curriculum to have been designed in a way that provides them with a culmination of knowledge and skills needed for future successes. Our pedagogical approaches to classroom practice mean that our curriculum can be flexible and rigorous enough to meet the needs of all of our students. The work we ask students to do in and out of lesson time is closely matched to the aims and intents of our curriculum. We provide a high quality of science education and so that students who experience our curriculum can understand the living world, its chemical nature and the physical forces that regulate it.