

# Richard Lander School



## Statement of Intent

Every subject maximises the potential of each student, enabling them to become successful learners, confident learners and responsible citizens. We will ensure that all students are well prepared for life and work and are keen to make a positive difference to the world they live in.

### Science

#### Intent

We believe that students deserve a broad and ambitious Science curriculum, rich in skills and knowledge, which develops a sense of excitement, ignites curiosity, equips them with the skills to understand and challenge information in the wider world, and ultimately prepares them for the next stages of their education, employment or training.

#### Skills

Our Science curriculum will give students the opportunity to:

- Develop practical skills by working scientifically; understanding the importance of valid and reliable data and how it is used in the wider world.
- Become scientifically literate, and able to articulate scientific concepts clearly and precisely.
- Use numerical and problem solving skills to generate and test their own hypotheses.
- Evaluate sources of information and address misconceptions in society.
- Become aware of the advances science has contributed to the modern world.

#### Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

#### Aims

The national curriculum for science aims to ensure that all students:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

## **Assessment**

Assessment is strategically positioned to enhance learning outcomes for all students. Formative assessments will be employed to gauge student understanding in real-time, allowing staff to adjust their teaching strategies promptly. Regular feedback loops, both teacher-student and peer-to-peer, will be integrated to create an environment of continuous improvement. Summative assessments in the form of end of module tests, end of year exams and PPEs will provide comprehensive insights into overall student achievement, enabling the department to identify areas of strength and weakness within the curriculum. By analysing assessment data collaboratively, our department will be empowered to make data-driven instructional decisions, adapting and refining lesson plans to better address the diverse needs of our students.

## **Rationale**

Key Stage 3 Science covers all of the aspects of the National Curriculum Programme of Study. Students build on learning from Key Stage 2, with the principal focus to develop a deeper understanding of a range of scientific ideas in the subject disciplines of biology, chemistry and physics. Concepts are sequenced to enable the revisiting of topics and skills each year, allowing consolidation of prior learning and the ability for students to see the connections between topics year on year and between the separate science disciplines. Students additionally develop key investigative skills and use of appropriate vocabulary. Year 7 topics are sequenced to allow a degree of interleaving. For example, the first biology topic is Cells, the second biology topic is Body Systems which revisits cells then explores levels of organisation and the structure and function of body systems. Year 8 topics build on the work covered in Year 7. As an example, in the third term of Year 7 students complete a chemistry module called Chemical Reactions. Part of this is work revisited in the first term of Year 8 where students study the Acids and Alkalies module and explore neutralisation reactions.

The interleaving of knowledge, practical, literacy and numeracy skills allows students across the ability range to revisit and build on prior knowledge which will support them to transfer information into long term memory, improving retention of knowledge and depth of understanding.

In Year 9 students begin the topics of AQA GCSE. All topics are found on both the Combined Science Trilogy as well as the Separate Science specifications. The chosen modules are designed to link the Key Stage 3 National Curriculum to GCSE, providing an important bridge between both key stages. As pupils progress through the science curriculum, new knowledge gets systematically integrated into pre-existing knowledge. This allows pupils to operate at more abstract levels. Year 9 topics include chemistry modules on Atomic structure and the Periodic Table. These revisit work completed during Key Stage 3 where students learn about particles and elements in Year 7 and the Periodic Table in Year 8. In Year 9 physics students study modules on Waves and Energy Resources which build on the work from Key Stage 3 on Sound, Light, Energy and Electricity. Year 9 biology topics include modules on Communicable and Non-communicable diseases which builds on some of the work covered in the Year 8 module Health and Lifestyle.

In year 10 and 11 students follow one of 2 pathways;

- AQA Combined Science Trilogy (8464) leading to 2 GCSEs in Science
- AQA GCSE Separate Science in Biology (8461), Chemistry (8462) & Physics (8463) leading to 3 Science GCSEs.

Combined Science students have 10 periods of science a fortnight and 2 science teachers, Separate Science students have 15 periods of science a fortnight and 3 specialist teachers. During Year 10 students cover modules of content from the Paper 1 exams, Year 11 focuses on the content from Paper 2. Year 11 PPE exams in November are Paper 1 exam papers which allow students to revisit the work that they have covered in Year 10 and some of the work covered in Year 9. Year 11 PPE exams in February are Paper 2 exams. Time is built in towards the end of Year 11 to allow for a comprehensive revision programme to ensure that students are well prepared for their GCSE exams.