THE SWEYNE PARK SCHOOL

CURRICULUM INTENT: **Science**

A key element of Science is discovery, the discovery of how the world works and our impact on it, from the subatomic to the galactic. The purpose of our curriculum is to produce young scientists who have a well-rounded background in all three Sciences. We aim for all students to be scientifically literate so that they can understand the new, ever-developing world around us. We are committed to giving pupils the skills to understand new discoveries, evaluate their importance and assess their reliability.

We encourage practical work as a key factor in developing an understanding of the nature, processes and methods of Science through different types of scientific inquiry in order to help pupils to answer scientific questions about the world around them.

We endeavour to continue these themes through all key stages.

We use a customised curriculum based on the AQA KS3 scheme of work. The scheme of work is split into short topics covering all aspects from the KS3 National Curriculum. It is assessed formally every term, with an exam that assesses all topics covered up to that point. This is designed to increase interleaving and to try and promote the idea that all three Sciences are interwoven and build upon each other.

Pupils begin their GCSE course in the Summer term of Y9. The majority of pupils will study the AQA Combined Science course. Full details of this can be found on the AQA website. These pupils will study short units of approximately 3-4 weeks, covering all of the content in Biology, Chemistry and Physics. Units will be assessed after each unit, these tests will include other content to promote interleaving.

Some pupils can choose to study separate Science GCSEs in Biology, Chemistry and Physics. This course is structured in the same way as the combined course however pupils will study all topics in greater detail.

At Key Stage 5 pupils may study AQA A Level Biology, AQA A Level Chemistry or OCR A Level Physics. In Key Stage 5, the focus becomes much more about content and preparing pupils for the rigours of university. We use a flipped learning approach to encourage students to prepare for the lessons beforehand. Full details of the content covered can be found on the associated exam board websites.

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CURRICULUM MAP: **Science**

Year	Knowledge (Topics / contexts) What pupils will '**know**'.	Skills acquired What pupils will be able to '**do**'.	Concepts developed What pupils will '**understand**'.	Assessments How do we and the pupils know what has been learnt?
7	Cells and Movement, Particles and separating mixtures, Sound and Light. Periodic Table and Elements, Human reproduction, Variation. Metals and Non-metals, Speed, Gravity, Earth Structure and Universe.	Basic Practical skills, including how to design and carry out experiments. How to record observations in tables. How to plot bar graphs to display results.	The importance of observation and understanding of anomalies. How scientific ideas have developed over time. The terms control variable, independent variable, dependant variable.	Each KPI is assessed either through an end of topic assessment, multiple choice quiz or teacher input. 7.0 Remember key basic scientific principles 7.1 Demonstrate science skills and follow the correct safety procedures 7.2 Use scientific language appropriately 7.3 Collect, present and analyse data 7.4 Understand cells and evaluate movement 7.5 Explain methods of separating mixtures using the particle model 7.6 Understand and compare sound and light waves 7.7 Analyse trends in the periodic table and explain properties of elements 7.8 Understand human reproduction and the importance of variation

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				7.9 Perform calculations, including rearranging equations, involving speed and gravity 7.10 Examine the structure of the earth and understand the structure of the universe
8	Current and Voltage, Breathing and Digestion, Acids and Alkalis Reparation and Photosynthesis, Chemical Energy and Reactions, Energy transfer and costs, Wave properties and affects and Interdependence.	Begin to design experiments with the independent and dependent variable in mind, including how to control some of the variables. Plot scatter graphs, and draw lines of best fit.	The importance of repeats and how to handle them.	Each KPI is assessed either through an end of topic assessment, multiple choice quiz or teacher input. 8.1 Demonstrate science skills and follow the correct safety procedures 8.2 Use scientific language appropriately 8.3 Collect, present and analyse data 8.4 Explain the interactions of acids and alkalis, metals and non-metals. 8.5 Understand electricity through current and voltage 8.6 Discuss the effects of interdependence and recall structures involved in plant reproduction

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				8.7 Apply ideas about energy transfer and calculate household costs 8.8 Examine the structures in breathing and digestion and analyse their adaptations 8.9 Establish wave effects and properties 8.10 Model chemical reactions using ideas about energy 8.11 Compare and contrast respiration and photosynthesis
9	Contact forces and Pressure, Evolution and Inheritance, Heating, Cooling and Work. Wave Properties and Effects, Magnets and Electromagnetism, Earth Structure and Climate and Earth Resources, .	Confidently be able to choose and draw appropriate graphs, including a correct scale, and correct line of best fit. Be able to confidently use Chemical symbols. Begin to convert between units. Construct tables with multiple data sets	The importance and use of preliminary experiments. How scientific thinking has developed over time. How scientific claims and evaluated and the concept of peer review.	Each KPI is assessed either through an end of topic assessment, multiple choice quiz or teacher input. 9.1 Demonstrate science skills and follow the correct safety procedures 9.2 Use scientific language appropriately 9.3 Collect, present and analyse data 9.4 Evaluate the role of energy in heating, cooling and work. 9.5 Establish the genetics of inheritance and discuss the evolution of species

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				9.6 Resolve contact forces and pressure in different systems 9.7 Recall the fundamentals of magnetism and the uses of electromagnetism 9.8 Appraise the evidence surrounding climate and the sustainability of earth resources.
10 & 11	Biology Cell Biology, Organisation, Infection and response, Bioenergetics, Homeostasis and Response, Inheritance, Variation and Evolution, Ecology. Chemistry Atomic Structure and the Periodic Table, Bonding, Quantitative Chemistry, Chemical Changes, Energy Changes, Rates of Reaction, Organic Chemistry, Chemical Analysis, Chemistry of the Atmosphere, Using Resources,	Using and evaluating scientific models. Being able to understand how an anomaly can occur and how it can affect results. Be able to calculate gradients from graphs. Be able to use y=mx+c and apply it to any graphs drawn. Confidently recall and rearrange all of the required equations.	How Scientific ideas have developed and changed over time. Understand how models are used in Science and the limitations of these models. How to design experiments to reduce potential anomalies and what to do if one occurs.	Summative assessments after every topic based on the scheme of work. Covering all content from that topic. Year 10 exam week, 1h 30m exam covering all content. Year 11 mock exam week. 3x 1h15min exams covering the content in Biology, Chemistry and Physics.
A-level Biology	Biological Molecules, Cells, Exchange and Transport, Genetics and Variation, Energy Transfers, Organisms Responses, Populations, Evolution and Ecosystems, Gene Expression.	Using and evaluation Scientific models, create and design experiments to create, test and evaluate key Biological concepts.	Pupils will understand how organisms function both on a cellular and macromolecular level. They will be able to design and evaluate how our understand has evolved and how we can test new (and existing) ideas.	Pupils will complete key end of topic tests to assess their knowledge and understanding of the key concepts.

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		Pupils will be able to develop key experimental skills both using specialist equipment and evaluating its uses.		Pupils will also complete the CPAC practical assessment throughout the course to assess their practical skills
A-level Chemistry	Physical Chemistry 1+2 Inorganic Chemistry 1+2 Organic Chemistry 1+2	Using and evaluation Scientific models, create and design experiments to create, test and evaluate key Chemistry concepts. Pupils will be able to develop key experimental skills both using specialist equipment and evaluating its uses.	Pupils will see how our fundamental knowledge of Chemistry has evolved over time. They will also understand the key chemical concepts of Physical, organic and inorganic chemistry.	Pupils will complete key end of topic tests to assess their knowledge and understanding of the key concepts. Pupils will also complete the CPAC practical assessment throughout the course to assess their practical skills
A-level Physics	Development of Practical Skills, Foundations of Physics, Motion, Forces in Action, Work, Energy and Power, Materials, Newtons Laws and Momentum, Electricity Waves, Quantum Physics, Thermal Physics, Gravity, Astrophysics, Capacitors, Electric Fields, Nuclear and Particle Physics.	Using and evaluation Scientific models, create and design experiments to create, test and evaluate key Physics concepts. Pupils will be able to develop key experimental skills both using specialist equipment and evaluating its uses.	Pupils will understand how the universe works in terms of forces and energy. They will understand the key mathematical principles behind the everyday laws that govern our universe. They will also be able to design and evaluate key experimental data to draw conclusions and evaluate discoveries.	Pupils will complete key end of topic tests to assess their knowledge and understanding of the key concepts. Pupils will also complete the CPAC practical assessment throughout the course to assess their practical skills