Science KS3

To develop skilled knowledgeable independent practical scientists.

The curriculum will allow all students across the academy to become successful scientists. All students will be supported to develop their understanding, motivated to secure their knowledge, and challenged to exceed expectations and maximise their potential in science. A broad range of science topics, balanced across the three main disciplines of Biology, Chemistry and Physics, will provide students with the awe, wonder and intrigue to develop their knowledge of the "Big Ideas" in science.

	Autumn Term	Spring Term	Summer Term
Year 7	**Cells, Tissue, Organs & Systems** This unit starts by reminding students about the features of organisms, and then looks at organs, tissues and cells. These ideas are then built back up in order to look at organs once again, in the context of organ systems. **Mixtures & Separation** This unit revises and builds on work in KS2 on materials, specifically on mixtures, solutions and separation techniques using the context of providing clean drinking water. **Energy** This unit uses a theme park to introduce the idea that stores of energy are needed to make most things happen. It looks at food, energy stores and transfers, and energy resources in terms of non-renewable fuels and renewable resources. **Sexual Reproduction in Animals** This unit explores sexual reproduction in animals, with a central focus on the human reproductive system and sexual reproduction in humans. It also cover growing up, puberty and the menstrual cycle linking closely with the wider school SRE curriculum.	**Acids and Alkalis** This unit looks at acids and alkalis and how they are described using a pH number. It looks at neutralisation reactions and some of their uses, and also introduces standard hazard symbols. **Current Electricity** This unit looks at the measurement of current and how it behaves in series and parallel circuits, and at voltage and resistance. Various models for thinking about what is happening in circuits are explored, and the unit concludes by looking at how we use electricity safely **Muscles and Bones** This unit uses a 'fitness' theme to cover three important organ systems: the gas exchange system, the circulatory system and the locomotor system. The various effects of drugs on these systems are also considered, together with their effects on the nervous system **The Particle Model** This unit develops an understanding of the different properties of solids, liquids and gases within the context of waste management and disposal.	**Forces** This unit revises the concepts of forces and their effects and extends students' knowledge of friction, gravity and springs. These ideas are presented using a theme of outdoor sports, such as climbing and mountain biking, to link to ideas about forces, friction and pressure. **Ecosystem** With a general theme about explorers, this unit looks at ecosystems and the factors that affect them. This includes the impact of human activity and the importance of biodiversity. **Atoms, Elements and Compound** This unit expands on particle theory and explains the differences between atoms, molecules, elements and compounds. It looks at the symbols and formulae for elements and compounds. Chemical reactions, the formation and decomposition of compounds, naming compounds and word equations are also covered. **Sound** This unit looks at how sounds are made, transmitted and detected, some uses of sound and compares sound waves with waves on the surface of water.
Year 7 Impact.	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term.**	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term plus content from the Autumn Term.**	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term plus content from the Autumn and Spring Terms.**

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	Autumn Term	Spring Term	Summer Term
Year 8	**Food and Nutrition** This unit looks at the main components in the human diet and why they are needed. The digestive system is also covered in some detail, and the idea of enzymes is introduced. **Combustion** This unit covers combustion and oxidation reactions, including those of hydrocarbons, metals and non-metals. Exothermic reactions are introduced and there is also a look at the pollution of the air by the products of fossil fuel combustion. **Fluids** This unit looks at changes of state, and then goes on to look at fluids and some of their effects, including pressure, floating and sinking, and drag. **Plants and Their Reproduction** This unit covers reproduction in plants, both sexual and asexual, although the former is of chief importance. Classification and biodiversity are also covered. The theme that is threaded through the unit is the various uses that we have for plants.	**The Periodic Table** This unit uses the context of fireworks to develop students' understanding of matter, atoms and chemical and physical change. Students then look at using the trends in the periodic table to make predictions about physical and chemical properties of elements and their compounds. **Light** This unit revises work from KS2 on light, which is then extended to consider how light travels and what happens when it meets an object. The unit is set in the context of stage, film and illusions. **Breathing and Respiration** Under the broad theme of water sports, this unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans. **Metals and Their Uses** This unit uses the context of metals used in building to review common physical properties of metals, and to introduce their main chemical properties. The idea that reactions can occur at different speeds is also illustrated and this leads to the introduction of the general reactivity series of metals.	**Energy Transfers** This unit looks at energy transfers by heating in the context of homes. The difference between internal energy and temperature will be discussed, along with conduction, convection and radiation. Calculations including power, efficiency, the kilowatt-hour and payback time will be introduced **Unicellular Organisms** Under the broad theme of diseases, this unit takes a detailed look at what unicellular organisms are, the differences between different types, their problems and their uses. **Rocks** This unit uses the context of metals used in building to review common physical properties of metals, and to introduce their main chemical properties. The idea that reactions can occur at different speeds is also illustrated and this leads to the introduction of the general reactivity series of metals. **Earth and Space** This unit builds on work from KS2 on the Solar System and looks at the Earth, including the seasons and the Earth's magnetic field and gravity. It also looks at the Solar System and what is beyond the Solar System. The theme is exploring the Solar System – in terms of observations and the use of models as well as via astronauts and space probes.
	Each topic includes the following assessments: • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term plus content from Year 7)**	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term plus content from year 7 and the Autumn Term.**	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term plus content from year 7 and the Autumn and Spring Terms.**

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	Autumn Term	Spring Term	Summer Term
Year 9	**Genetics and Evolution** This unit recaps ideas about the causes of variation and then looks at inherited variation in more detail. DNA is introduced before students consider how inherited genes can affect an organism's survival. The unit ends with coverage of natural selection. **Making Materials** This unit looks at the manufacture, properties and uses of different types of materials including ceramic, polymer and composite materials. Properties of these materials are linked to their uses. The unit continues by looking at some of the problems caused by synthetic materials and possible solutions to these problems including recycling **Forces and Motion** This unit starts by revising some aspects of forces and their effects, energy stores and transfers. It then looks at calculations of speed and relative speed, and representing journeys on distance–time graphs. Finally it will look at simple machines (levers, ramps and pulleys). **Projects** Some time will be spent on project work which brings together concepts from all of KS3 in preparation for the end of Key stage assessment.	**Plant Growth** This unit looks at photosynthesis and aerobic respiration in plants in more detail, and then considers plant adaptations. The products we get from plants are then looked at, before studying farming methods and their problems. **Reactivity** This unit looks at reaction of metals including then the reactivity series. Exothermic and endothermic reactions are introduced, followed by displacement reactions. The method of extraction of a metal is related to its position in the reactivity series. Calculation of percentage change is related to oxidation and thermal decomposition reactions. **Force Fields and Electromagnets** This unit starts by revising previous work on magnetic and gravitational fields, then introduces static electricity and the idea of an electric field. Work on current electricity is revised, and then extended to look at resistance calculations and at some uses of electromagnets **KS3 Revisions** Some time will be spent revising concepts from all of KS3 in preparations for the end of key stage assessment.	**Cells** Microscopy, plant and animal cells, prokaryotic and eukaryotic cells, specialisation in plant and animal cells, diffusion, osmosis and active transport. **Atomic Structure** Atoms, Chemical symbols, chemical equations, reactants an products, balancing equations, separation techniques (filtering, distillation, chromatography, history and structure of the atom, Ions and Isotopes, Electronic Structure **Conservation of Energy** Energy Stores, Energy transfers, conservation of energy, work done, friction, GPE, KE, EPE, dissipation, useful and wasted energy, efficiency, power.
	Each topic includes the following assessments: • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of Term Synoptic assessment assesses all content from this term.**	**Each topic includes the following assessments:** • **Diagnostic Pre-Check** • **Homework booklet** • **Extended Writing Task** • **End of Topic Knowledge Checker.** **End of KS3 Test covering all content from Year**	**Each topic includes the following assessments:** • **Homework tasks** • **Extended Writing Task** • **End of Topic Knowledge Checker.**