KS3 SCIENCE

Team Leader: Ms Shariff
Teachers: Ms Hill (Acting Subject Lead for Biology), Dr Wellington (Subject Lead for Chemistry), Mr Papapostolou (Subject Lead for Physics), Ms Cater (KS3 Coordinator), Mr Taylor-Mitchinson, Ms McDaniel, Ms Castro, Mr Peri, Ms Soblyte, Ms Farah, Ms O'Connor. Ms Perry (Subject lead for Biology, Maternity leave).

Aims

- To capture the students' imaginations and develop their scientific curiosity.
- To enable our students to grow into confident learners who can use their science knowledge fluently, appreciate the patterns and links across biology, chemistry and physics and use their practical and investigative skills to explore problems and find solutions.
- To enable our students to become responsible citizens who can ask the questions that need to be asked, live safe, healthy, fulfilling lives and make a positive contribution to society.

Ks3 science	Year 7	Year 8	Year 9
Lessons per two week cycle	6 lessons	7lessons	7 lessons
Assessment	• A skills-based task per topic • A topic test at the end of every two topics. The test will assess fact recall, application of knowledge, and the key skill for each topic.	• A skills-based task per topic • A topic test at the end of every two topics. The test will assess fact recall, application of knowledge, and the key skill for each topic.	• A skills-based task per topic • A 30 minute topic test at the end of each topic. The test will assess fact recall, application of knowledge, and the key skill for each topic.
Home learning	• Set weekly (Tuesday) on Sparx to support and consolidate learning and due in the following week.		
Remote learning	• Learning booklets are all uploaded onto Teams • If students are working from home, they should message their class teacher via TEAMS for work to complete.		

Useful resources and enrichment

- **Watch**
  Bang Goes the Theory on BBC
  Any scientific documentary on the BBC- e.g. Planet Earth, Stargazing Live, Wonders of the Universe. Catch them again on iPlayer!
- **Read**

Catalyst Science Magazine for students
The Microcosm Science pages in the Metro.
NT Science Activities

- **Visit**
  The Science Museum
  The Natural History Museum
  The Greenwich Observatory

Year 7	**Scheme of Learning**	**Brief description of content & Teams links to resources**
Autumn term	Transition unit	• Students will learn how to work safely in a science lab • How to recognise and mitigate hazards in the lab • How to operate a Bunsen burner safely • How to plan a scientific investigation Key skill: How to draw laboratory equipment scientifically
	Chemistry U1: The Particle Model	• Students will learn about the particle model of matter • The different states of matter and how changes of state occur • How to separate mixtures using practical techniques Key skill: How to draw particle diagrams
	Physics U1: Energy & Electricity	• Students will learn about the different types of energy and how energy is shifted in appliances • How the idea of energy can be used to understand voltage, current, and resistance of a circuit • Recognising circuit components and their functions • The differences between series and parallel circuits Key skill: How to draw circuit diagrams scientifically
	Biology U1: Cells	• Students will look at the building blocks of living things, cells • The range of structures found inside cells • How different living things have evolved to become most suited to their environment on a cellular level • A range of specialised plant and animal cells • How cells work together in tissues, organs and systems Key skill: How to draw cells/tissue scientifically
Spring term	Physics U2: Forces	• Students will learn about the different types of forces and their uses • How to use the idea of forces to describe the motion of objects • How friction affects the motion of objects • Investigate the effect of different factors on air resistance • Key skill: Drawing bar graphs
	Biology U2: Movement	• How the skeleton, muscles and joints work together to enable movement. • Students will then investigate how different animals' skeletons have adapted to allow movement that is better suited to their environment and lifestyle. • How muscles work to enable ventilation

		Key skill: Making a scale on a scatter graph
	Physics U3: Space	• Students will learn about the origins and features of the solar system, as well as our place within it • The phases of the Moon • Why we have days, years, and seasons • The various means of exploring space Key skill: Plotting points on a scatter graph
Summer term	Chemistry U2: Acids & Alkalis	• Students will learn about chemical and physical reactions • Examples of, and the differences between, acids and alkalis • How indicators work and examples of them • Neutralisation reactions Key skill: Drawing lines of best fit on a scatter graph
	Crick project	• How to use scientific equipment to obtain accurate results • How to interpret and evaluate qualitative data
	Revision End of year test	The end of year test will assess content knowledge and skills developed throughout the year through fact recall and application questions.
	Biology U3: Reproduction	• Students will learn about the reproductive system of mammals • The changes that occur during puberty and the similarities and differences between boys and girls • What happens to a foetus during pregnancy • The reproductive system of plants • How plants disperse their seeds Key skill: How to interpret information from graphs

Year 8	Scheme of Learning unit	Brief description of content & Teams links to resources
Autumn term	Chemistry U3: Chemical reactions	• Students will learn about elements, compounds and mixtures • The layout and use of the Periodic table • Reactivity series of metals • Chemical reactions of metals with water, oxygen, and acid Key skill: Writing word equations
	Biology U4 – Plants and Photosynthesis	• Students will learn about the structures and functions of the different parts of a plant. • Students will learn how plants are adapted to utilise the products of photosynthesis • Students will investigate factors that affect the rate of photosynthesis and how these can be used by agricultural scientists to maximise crop yields. • Key skill: Analysing data from graphs
	Physics U4: Energy	• Students will learn about different types of energy and how energy is shifted from one type to another • How to calculate the gravitational potential energy of an object and work done • Factors that affect the efficiency of energy shifts • How electricity is generated in power stations • Alternative fuel sources for electricity generation • Key skill: Using equations to perform calculations
	Chemistry U4: Earth and its atmosphere	• Students will learn about the Earth's structure • How the Earth's atmosphere has evolved over time • How to categorise rocks and describe the rock cycle • Climate change • Key skill: Describing processes
Spring term	Biology U5: Diet and digestion	• Students will learn what makes up a balanced diet • How different animals have different diets and the adaptations they have evolved to make them most suited to these lifestyles • Diet deficiencies causing a range of diet related diseases • How to chemically test food for a range of food groups • How the body is adapted to digest food and the effect of enzymes in digestion. Key skill: Describing processes

	Physics U5: Forces	• Students will learn how to measure forces experimentally as well as how to draw and interpret force diagrams • How the idea of resultant forces is applied in Newton's laws, describing the motion of objects • How to explain the difference between the mass and weight of an object • How to calculate moments, pressure, and the speed of an object Key skill: Using equations to perform calculations
	Crick project	• How to use scientific equipment to obtain accurate results • How to interpret and evaluate qualitative data
Summer Term	Chemistry U5: Energy changes	• Students will learn about different chemical reactions in terms of energy • The difference between endothermic and exothermic reactions • Drawing reaction profiles Key skill: Drawing scatter graphs with lines of best fit
	Revision End of year test	The end of year test will assess content knowledge and skills developed throughout the year through fact recall and application questions.
	Physics U6: Waves	• Students will learn about the key features and examples of waves • The difference between sound waves and light waves • What happens to waves during reflection and refraction • Use the idea of waves to explain, for example, why the sky is blue and how a pinhole camera works Key skill: Labelling waves
	Biology U6: Respiration and breathing	• Students will learn about the structures of the respiratory system and how these are adapted to maximise gas exchange • Students will learn about respiratory diseases • How exercise impacts respiration • How aerobic respiration compares to anaerobic respiration Key skill: Analysing data from graphs
Year 9	**Scheme of Learning unit**	**Brief description of content & Teams links to resources**

Autumn term	Biology – Cells and Transport	In this topic, students will learn: • The structure and function of cells (eukaryotic and prokaryotic cells) • How to successfully use a microscope and calculate magnification • How to convert units • How to rearrange equations with 3 variables
	Chemistry – Atoms & equations	In this topic, students will learn: • About the particle model & changing states • How the Periodic table is organised • How to calculate the number of protons, neutrons and electrons using the atomic number & atomic mass of an element • How to draw electronic configuration
Spring Term	Physics – Electricity and magnetism	In this topic, students will learn: • How to draw and construct series & parallel circuits scientifically • Current and potential difference in series & parallel circuits Key skills: • Scientific drawings of circuits • Extended writing – evaluations using key terminology
	Biology – Genetics	• The structure of DNA and an introduction to genetics • How the theory of natural selection is a mechanism for evolution Key skills: • Drawing and interpreting graphs • Extended writing – Explain how species have evolved using Darwin's theory of natural selection
	Chemistry – Rate of Reaction	• How to write word equations and balance symbol equations • How to safely carry out and plan a practical to investigate the effect of a factor on the rate of reaction
	Physics - Energy	• Describe different energy stores. • Explain energy shifts • Explain energy efficiency
	Revision for end of year 9 test	The end of year test will assess content knowledge and skills developed throughout the year through fact recall, application and analysis questions
Summer term	End of year 9 topic test	The end of year test will assess content knowledge and skills developed throughout the year through fact recall, application and analysis questions
	Chemistry GCSE C1 **How is atomic structure linked to reactivity?**	In this topic, students will learn: • The history of the Periodic Table • Atomic structure and electron configuration • How to separate substances • The reactivity of elements (the reactivity series and Group 1&7 elements) • How the reactivity series can be used to predict the outcome of reactions (displacement reactions)

		Key skills: • Predict the outcome of reactions using the reactivity series • Research on the development of the Periodic Table
	Biology GCSE B1 **How is the structure of cells related to function?**	In this topic, students will learn: • How the microscope developed over time • How to calculate magnification and convert between units of length. • The structure and function of specialised cells • How substances are transported into and out of cells (diffusion, osmosis and active transport) Key skills: • Drawing and interpreting images of cells Converting between units of length (centimetre, millimetre, micrometre, nanometre)
	Physics GCSE P3 **How does the particle model apply to everyday life?**	In this topic, students will learn: • How to calculate the density of regular and irregular objects • Different changes of state and why they occur in terms of internal energy • How to calculate specific heat capacity • How to calculate specific latent heat – the energy needed for a substance to change state • How the movement of particles in a gas and pressure exerted changes when the temperature changes Key skills: • Calculations and change in units • Write a method to carry out the density practical on an irregular object