

Science Key Stage 3 Programme of Study

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Cells	Energy resources	Forces	Ecology	Electricity	The Solar system
	In this unit pupils are introduced to cells. They will explore and develop their understanding of animal and plant cells, cell specialisation, cell division and organ systems. Students will also have the opportunity to develop microscopy skills, slide preparation and scientific drawing.	An introduction to the basic concept of energy and the forms it can take. Knowledge of the different forms energy takes and of energy transfers will be applied to the context of living things, fuels as sources of energy (including fossil fuels and renewable energy resources) and the importance of the sun. The environmental impacts of different energy resources will also be considered.	Students will explain what a force is and how it can affect a body. Contact & non-contact forces will be introduced and the basic principles / facts of friction, & balanced and unbalanced forces covered. This topic will also introduce the basic equation for calculating speed.	Looking at the environment, adaptations of animals (genetic and environmental) and predator prey relationships. Students will then look at food chains and webs, including the role of producers, complex food webs, animal populations & the need for food management & sustainable development. Students will then apply this to their local context.	Students will look at conductivity of different materials, the uses of electricity and series and parallel circuits. Students will also be introduced to models that will help explain current, voltage and resistance.	Students will look at why we have day/night, seasons, the cycle of the moon, the movement of the stars and the structure of our solar system. Students will also learn about the gravitational pull between bodies, how gravity relates to mass and distance and how gravity keeps satellites (natural and artificial) in orbit.
	Particles	Reproduction	Classification	Acids & Alkalis	Chemical Reactions	Year 7 science project
An introduction to the three states of matter and the particle model. Students will be asked to apply this to a number of scientific concepts; e.g. diffusion, density pressure and dissolving / solutions.	Looking at the science behind human reproduction from fertilisation through to birth and beyond. Students will learn the anatomical structure of the reproductive system and look at internal & external fertilisation, IVF & ethical issues such as abortion.	Students will develop their classification skills by looking at variation among biological groups. Students will identify and classify animals into groups (kingdoms, phylum, family etc.). Students will apply these skills to other contexts	Students are introduced to acids and alkali's. They will look at indicators and misconceptions around the meanings of strong, weak, concentrated, dilute, acid etc.	An introduction to common chemical reactions (e.g. combustion & oxidation) and word equations. Students will learn how to identify when a chemical reaction has taken place and the difference between chemical and physical changes will be revised. The concept of the conservation of mass will be introduced	Science fayre – Year 7 project work celebrating science innovation and invention.	
Year 8	Food and Digestion	Magnets & Electromagnetism	Compounds & Mixtures	Microbes & disease	Heating & Cooling	Extended science
	Exploring food groups and how they are important in a balanced diet. The structure of each of the food groups and how all components of a healthy diet are important for energy, growth or repair.	Looking at magnetic materials and magnetic fields. Introducing electromagnets and electromagnetism and Investigating factors that affect the strength of permanent and temporary magnets (distance from magnet / number of turns on an electromagnet coil).	Identifying compounds Vs elements. Using formulae to describe compounds and introducing symbol equations to describe reactions. Comparing compounds to mixtures (e.g melting / boiling curves for pure / impure substances & looking at separating mixtures & solutions).	Learning that micro-organisms are living things, how they grow, how they can be used to make products and how they cause infection. Students will also learn how we have evolved to prevent and deal with infections.	Understanding temperature scales and the difference between temp and heat (internal energy). Looking at how heat is transferred by conduction, convection and radiation. Linking these to how heat affects particles (particle model) in terms of expansion. Convection currents and changing state.	Options range from specific and discreet units such as the science of forensics or rockets to the development of investigative skills and the concept of “how science works”.
	Atoms & Elements	Respiration	Light, Sound & Hearing	The Earth & the Rock Cycle	Ecological relationships	
Looking at the concept and definitions of atoms and elements. Looking at the structure of the	The process of respiration that occurs in living cells. The purpose/function of respiration	Building on knowledge of light. Representing light as a ray that can be reflected, refracted, diffracted	Students will identify different rock types based on their physical and chemical properties (e.g. the	Studying habitats in detail. Identifying organisms in it, population sizes and feeding		

	periodic table, how it was constructed and element symbols. Using the particle model to explain the properties of different elements and what happens when atoms combine.	and how cells are provided with the materials it needs to carry the process out. (This includes anaerobic & aerobic resp)	and split. This links to the electromagnetic spectrum and the science of colour (appearance, absorption and transmission) Build on knowledge of sound and hearing.. Explaining how and why the ear works and why sound needs a medium to travel through. Also looking at the dangers of loud sounds to our hearing.	reactions of carbonate rocks). This topic will also look at how sedimentary, igneous and metamorphic rocks are formed. They will also cover weathering, erosion, transportation and sedimentation. Combining this into the rock cycle.	relationships. Quantifying communities with pyramids of number and biomass & methods for gathering this data (quadrants, sampling techniques). Learners will also pull learning from year 7 together to look at how a community is affected by its environment and the activities of humans. Again – to be applied to a local context.	
Year 9	Speed, Acceleration & understanding forces	Inheritance & selection	Reactions of metals, non metals and their compounds & Patterns of reactivity	Energy Transfers and the importance of electricity.	Extended science/ how science works	Extended science/ how science works Preparation for the GCSE course and the specific investigative / science enquiry skills.
	Looking at Newton's laws e.g. $f=ma$. Discovering the relationship between forces acting on an object and its movement. Looking at air and water resistance and falling.	How traits and characteristics are inherited. The applications of this knowledge in selective breeding (and genetic engineering?). Looking at environmental variation in more detail.	Exploring the chemical properties of metal and non-metal elements. Using word and symbol equations. Using these reactions to create a reactivity series for group 1 (and other) elements.	Exploring energy transfers and transformations. The uses of electricity to transfer energy. The conservation of energy and a detailed look at voltage.		
	Plants, Photosynthesis & plants for food	Fit & healthy	Environmental and material chemistry	Newtonian Physics – Pressure & Moments		
	Linking photosynthesis with the production of Biomass. How the sugar produced in photosynthesis is used by plants. Details of photosynthesis including symbol equations, limiting factors and the structure and function of the roots, leaf & specific organelles relating to photosynthesis (chloroplasts & chlorophyll)	The structure of the respiratory, digestive and circulatory systems and how smoking, diet and drugs etc. can affect the human body. The function of the skeletal and muscular systems to be looked at too.	Looking at the chemistry in the environment, chemical weathering, soils, ores as a source of metals and minerals, water, carbon and nitrogen cycles & the effects of human activities on the atmosphere & environment. Looking at the chemistry behind materials science and the production of chemicals and new materials.	Students will look at the pressure in more detail, and then consider the applications of pressure in our lives, hydraulics, pneumatics etc. Students will also look at the uses of Moments to do work (leverage & turning effects – the principle of moments).		

Options for extended science projects will range from specific and discreet units such as the science of forensics or rockets to the development of investigative skills and the concept of “how science works”. The final term of year 9 will be used to prepare students for the GCSE course and the specific investigative / science enquiry skills.