Year 8 Curriculum Implementation: Science

	Autumn	Spring	Summer
Knowledge & Skills	**Nutrition & Digestion** • Identify the seven nutrient groups and what each is needed for • Food tests for starch, protein, glucose and fat • Identify what makes a balanced diet • Energy in food practical • Unbalanced diets and deficiency diseases • Identify parts of the digestive system and their function • The role of enzymes in digestion • The role of bacteria in absorption **Periodic Table, Atoms & Elements** • Knowing that elements are made of one type of atom • Identifying common elements of the periodic table • History of the periodic table • The modern periodic table and how to interpret it • Group 1, 7 & 0 elements and their properties • What a compound is and how they are formed • Naming compounds and molecular formula • Calculating relative formula mass • Writing word equations **Light** • Introducing waves – transverse and longitudinal • Transmitting light – EM spectrum • Investigating transparent, translucent and opaque materials • Reflecting light – ray box practical • Bending light – refraction practical • Structure & function of the eye and camera and making comparisons • Colours of light • Filtering and mixing colours of light	**Sound** • Sound waves and how they are made • Analysing frequencies for different pitches and sounds • How sound travels and what echoes are • Measuring the speed of sound • Structure and function of the ear • Comparing human hearing range to other organisms • Investigating ultrasound and infrasound • How sound can damage the ear and how to prevent this • Investigating and comparing microphones and loudspeakers **Chemical Reactions 1** • Identifying and comparing physical and chemical changes • Oxidation – what is it • Fire triangle and combustion • Constructing combustion equations • Catalysts – what they are and how they work • Exothermic and endothermic reactions • Gas tests practical (oxygen, hydrogen and carbon dioxide) • Flame tests practical • Thermal decomposition **Energy, Heat & Insulation** • What is energy? • Energy stores and transfers • Temperature and how it differs from heat • Convection practical • Conduction practical • Radiation practical • Thermal equilibrium or imbalance • Investigating insulation	**Health** • Drugs (legal & illegal) – what they are, what they do and how they are categorised • Alcohol – what it is, the short and long-term effects on the body • Smoking – the contents of cigarettes and how they affect health • Structure of the lungs and how asthma affects the lungs • Effects of exercise – heart rate and pulse • Diffusion in liquids and gases practical • Diffusion in cells • Aerobic respiration – what it is, why it's necessary and the reactants and products • Anaerobic respiration - what it is, why it's necessary and the reactants and products • Fermentation **Electrical Circuits & Magnetism** • Static electricity – what is it and how is it made • Electrical circuits and their components • Making and comparing series and parallel circuits • Investigating current • Investigating potential difference • Investigating resistance in a wire • Comparing appliances and the power they use • Calculating home energy use • Investigating magnetic materials • Making magnets • Uses of electromagnets **Pressure** • Pressure – what it is and how to calculate it • Investigating pressure • Investigating why heavy objects float • Pressure in liquids • Atmospheric pressure • Uses of P-waves
Links to prior learning	**Year 3 Animals, including Humans** • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat **Year 4 Animals, including Humans** • Describe the simple functions of the basic parts of the digestive system in humans **Year 6 Animals including Humans** • Recognise the impact of diet, exercise, drugs, and lifestyle on the way their body's function • Describe the ways in which nutrients and water are transported within animals, including humans **Year 3 Light** • Recognise that they need light to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by an opaque object • Find patterns in the way that the size of shadows change **Year 6 Light** • Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to explain that objects are seen because they give out of reflect light into the eye • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	**Year 4 Sound** • Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound source increases **Year 5 Properties and changes of materials** • Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity, and response to magnets • Know that some materials will dissolve in a liquid to form a solution and describe how to recover a substance from a solution • Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving, and evaporating • Give reasons, based on evidence from comparative and fair tests, for the uses of everyday materials, including metals, wood, and plastic • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	**Year 6 Animals including Humans** • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs, and lifestyle on the way their body's function • Describe the ways in which nutrients and water are transported within animals, including humans **Year 3 Forces and Magnets** • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing **Year 4 Electricity** • Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers • Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery • Recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit • Recognise some common conductors and insulators, and associate metals with being good conductors

			Year 6 Electricity • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Used recognised symbols when representing a simple circuit in a diagram
Assessment	• Nutrition & Digestion prior knowledge quiz • Nutrition & Digestion formative assessment • Periodic Table, Atoms & Elements formative assessment • Nutrition & Periodic Table assessment (when both units completed) • Light prior knowledge quiz • Light formative assessment • Light & Sound assessment (when both units completed)	• Sound prior knowledge quiz • Sound formative assessment • Light and Sound assessment (when both units completed) • Chemical Reactions prior knowledge quiz • Chemical Reactions formative • Energy, Heat & Insulation formative assessment • Chemical Reactions and Energy, Heat & Insulation assessment (when both units completed)	• Health prior knowledge quiz • Health formative assessment • Electricity & magnetism prior knowledge quiz • Electricity & magnetism formative assessment • Chemical Reactions and Energy, Heat & Insulation and Health assessment (when all three units completed) • Pressure formative assessment • Electricity & Magnetism and Pressure end of unit assessment (when both units completed)
Home learning	• Key word spellings and definitions • Educake quiz • Food is our fuel article • Atoms & Elements article • What causes reflections article • Retrieval Practice sheets	• Key word spellings and definitions • Educake quiz • They see with their ears article • Measuring temperature article • Retrieval Practice sheets	• Key word spellings and definitions • Educake quiz • Oxygen exchange article • Charge it article • Retrieval Practice sheets
Cultural Capital and extra-curricular opportunities	• KS3 STEM club	• KS3 STEM club • British Science Week Activities • Science House Cup Challenge	• KS3 STEM club • KS3 trip to Manchester Museum of Science & Industry
Literacy	• Key word spellings and definitions • Science story – discovery of vitamins • Science story – atomic theory • Science story – a journey through photography	• Key word spellings and definitions • Science story – discovering the magic of sound • Science story – activation energy • Science story – the first law of thermodynamics	• Key word spellings and definitions • Science story – discovery of alveoli • Science story – lighting the way with blue light • Science story – Treasure voyages
Numeracy	• RDA food intake • Interpreting food labels • Measuring angles of incidence, reflection & refraction • Calculating mass	• Calculating speed of sound • Interpreting sound wave diagrams • Drawing, interpreting & analysing graphs	• Calculating and comparing energy use • Calculating the cost of electricity
Careers Information, Education, Advice and Guidance (CEIAG)	• Dietician reading comprehension • Dental hygienist Lesson • Cosmetic chemist reading comprehension • Architectural glass engineer reading comprehension • Optician lesson	• Sound engineer reading comprehension • Pharmacist lesson • Thermodynamics engineer reading comprehension	• Respiratory specialist reading comprehension • Health care assistant lesson • Mechanical engineer lesson • Electrical engineer reading comprehension • Meteorologist reading comprehension
Spirituality	• Working with a lab partner – respect/ friendship • How our bodies work – self awareness	• Working with a partner – tolerance, patience	• Respect for ourselves, our bodies • Working with a lab partner – respect/ friendship • How our bodies work – self awareness
How can parents support the curriculum?	• Read the science article together • Test the key words and definitions • Encourage students to use the knowledge organiser • Watch documentary series on BBC iplayer such as: Royal Institution Christmas Lectures – ‘the truth about food’	• Read the science articles together • Test the key words and definitions • Encourage students to use the knowledge organiser	• Read the science articles together • Test the key words and definitions • Encourage students to use the knowledge organiser