Science Curriculum Overview KS3 – Year 7

	Autumn	Spring	Summer
1	**Science safety** To develop understanding of Science equipment and how to use it safely, what the potential dangers are and how to avoid them, what to do if something goes wrong Familiarity with the science lab & equipment. 1. Health & safety essential information. 2. Risks and peer support. Life Skills – Sharing, awareness of danger, knowing what to do if something goes wrong, developing awe and wonder, the desire to find out more	**Cell Biology 1** To be able name the parts of a plant. To know there are different types of animals Living things- Features of Plants and Animals Growing Plants from seeds and recording growth Animal Classification, Animal Life Cycles What living things need to survive? Parts of the cells Life Skills – Sharing, awareness that things grow, being able to look after a plant, developing awe and wonder, the desire to find out more (allotment bed activity) Understanding of the living world, respect for the planet	**Solids, Liquids & Gases** Investigate the structure for Solids, Liquids and Gases Investigate reversible and irreversible changes to be able to say why some materials are better than others for jobs, giving reasons using scientific language. To understand that the particles of each state of matter work differently. What the best materials are for certain jobs? Why are some better than others? Be able to describe changes using scientific language and to say what is a solid, liquid or gas, to know that they are different.
2	**Solar System** Develop understanding of the Solar System, size of different planets and distance from the sun. Orbits and how these are different for each planet. The different make-up and atmospheres of each planet, Study of a specific planet. Phases of the sun and moon and the impact this has on the earth, Name the planets in order. Know that they are different in size and what they are made of. The sun is the centre of the Solar system and we orbit it, that the moon orbits us, the sun is the biggest object in the Solar System, The sun gives us light, That 24 hours equal a day. Eclipse	**Cell Biology 2** To investigate the function of the different organs in the body and how the skeleton supports them Living things- Human Body Investigate the make- up of the Skeleton and the different bones. investigate the senses. Understanding of our own bodies, what we are capable of. What do we have in our body that keeps us alive? Life Skills - How can we keep our bodies healthy? (diet and exercise) How does exercise impact our bodies? How long does it take your bodies to get back to resting heartrate? (skipping/star jumps, measure pulse – what does it mean?)	**Acids and Alkalis** Investigate several chemical reactions using acids and alkalis and record observations. To know that chemical reactions cause changes. to be able to sort acids and alkalis onto the pH scale to indicate weaker and stronger substances. To describe changes using scientific language. To explain that acids and alkalis are on the pH scale and to know where they are found on the scale. To identify an acid and an alkali and what they are used for. To be able to state that acids and alkalis cause changes when mixed with each other. To know there is a pH scale and acids and alkalis are on it.

Science Curriculum Overview KS3 – Year 8

	Autumn	Spring	Summer
1	**Light** Light spectrum: rainbow colours. To identify that refraction is when light bends. to investigate reflection and refraction. To use a light box with colour filters to understand the light spectrum Key terms/ concepts transparent, translucent and opaque. Light travels in a straight line. Bending light. Light sources. Mirrors and reflections. Refraction. **Sound** To Investigate amplitude, measure, decibels, sound insulating properties of various materials , Safe noise levels & noise pollution. To know that sounds are made by vibrations and is measured in decibel (dB). To be aware of the affects of noise pollution	**Atoms and Elements** Materials and the elements which make them. To explain that in chemical changes new substances are formed To know that atoms can combine to form molecules To represent and explain chemical reactions by word equations, models or diagrams The Periodic Table: chemical symbols and atomic structure of common elements. Compounds and molecules: particle models; burning magnesium. To recognise the periodic table. To know that oxygen is an element in the periodic table Elements for good/bad: Uranium = nuclear power. Plutonium = Atomic bomb	**Compounds and mixtures** Combinations of elements. To explain that elements contain only one kind of Atom and that compounds contain more than one kind of atom joined together To understand that compounds contain elements that are chemically combined, boiling and melting points of elements Research melting & boiling points of compounds. Chemical reactions: observations & conclusions. To identify some elements from the periodic table, gas, liquids and solids. To name and draw some compounds. Difference between a compound and a mixture
2	**Respiration** To know that we can breathe through our mouths and noses. To know that our bodies need oxygen to survive To know that exercise can make them breathless To understand that products of digestion are transported in the blood to other parts of the body. To know that glucose is an energy resource for cells. To know that plants and other animals produce CO2 during respiration The circulatory system & the organs used. Measure pulse rates & use a stethoscope. Aerobics: the effects of exercise – data collection. Benefits of exercise in a healthy lifestyle	**Microbes and Disease** To identify and define different microorganisms. to observe what happens them over time. Three types of micro-organisms: bacteria; viruses; mould & fungi. Yeast and sugar investigation. The body's natural defences. Research diseases e.g. Measles, Athletes Foot, Thrush, Salmonella, Tuberculosis. Need for personal hygiene, vaccinations and historical practises to cure some diseases. To understand why we should 'catch it., kill it bin'.	**Magnets** To explain why opposite poles attract. To know some uses for magnets. Magnets investigation: attract & repel; poles; magnetic fields using iron filings; making magnets. Earth's magnetic field – North & South poles. Electro-magnets. magnetic field **Heating and Cooling** To explain the chemical changes which occur when a solid is heated or a liquid is cooled. To recall the boiling and freezing point of water. Reading temperature scales, using thermometers – data collection. States of Matter: Particle diagrams, solids/liquids/gases. Conduction & convection – heat transfer. Keeping warm & insulation. The importance of maintaining body temperature

Science Curriculum Overview KS3 – Year 9

	Autumn	Spring	Summer
1	**Ecological Relationships & Nature Studies** To explain that organisms only survive in a habitat where they have all the essentials for life and reproduction To know that that green plants can be subdivided into those with vascular tissues (xylem and phloem) and complex leaves with a waterproof cuticle, and those without. Classifying animals: vertebrates & invertebrates Classifying green plants, preserving rainforests Habitats and adaptation To show sensitivity to living things in their environment.	**Food** To explain how photosynthesis and describe the structure of plants and transportation of water and minerals. Recognise environmental factors that affect plant growth. Plant propagation: from seed & cloning Testing leaves for starch & measuring soil pH. Organic farming & fertilisers Milk production; pasteurisation & sterilisation Organic farming - yield Vs cost; cloning Selective breeding and its impact on yield, and begin to understand genetic engineering. Consideration of food provenance and sustainability GM foods	**Acids & Alkalis** To be able to use a pH scale and know examples of why it's important in daily life Common acids & alkalis & their uses; pH tests. Chemical reactions to make & test for carbon dioxide & hydrogen gases. common acids & alkalis around the home Make connections to soil testing and understand neutralization e.g use of indigestion remedies. Recognise & recall common acids & alkalis. Neutralisation linked to indigestion remedies. Use of dyes; water = neutral & life-saving;
2	**The Periodic Table** To explain that the periodic table is a way of organizing elements (materials) and what. metals/non-metals are The Periodic Table and common elements. Groups: Alkali metals, Halogens, Noble Gases – what makes them a group – characteristics (number of electrons in outer shell). Atomic structure and models Metals & non-metals Know that atoms from group 1 & group 7 make stable compounds e.g salt when they bond together Understand basic atomic structure & grouping in the Periodic table.	**Plants and Animals** To explain food webs begin with sun's energy Producer, primary consumer, predator / prey top predator. Be identify how we classify organisms and explain their adaption to habitats Describe that DNA is now used to help classify organisms. Food chains & webs: producers, predators, prey. Carnivore, Omnivore ,Herbivore. Sampling methods Animal welfare, sustainability, religious practice about consuming certain animals. Plants & photosynthesis Understand the impact of humans on biodiversity.	**Life Processes** To recognise & locate main organs used in life processes including liver; Know that food & oxygen give the body energy. The 7 life processes; relevant body systems & organs; cell growth & repair. Organ donation. Interpret data on breathing, pulse rates & fitness Health & fitness, life after death, reincarnation & organ donation including religious restrictions. of respiration as breathing & digestion for energy with excretion of CO2; Identify lungs, heart, brain, stomach intestines, bladder, bowel & kidneys on a model Understand how organ (& blood donation) can save lives & opting out process.