CORE KNOWLEDGE

What I will know and understand by the end of Year 7.

	During this year in science we will be developing our scientific knowledge and conceptual understanding of-	This links to:	Key Vocabulary:	
1	• **Organisation** – biological molecules that make up the diet, energy in food, the skeleton, the digestive system, reproduction, gametes, fertilisation, pregnancy and birth. • **Energy** – energy stores and transfers, types of energy resources. • **Particle model** – the particle, solids, liquids and gases, changes in state, physical and chemical changes.	**Y4 & Y6** digestive system and nutrients. **Introduction** to energy. **Y4 & Y5** properties of different materials.	Carbohydrate Protein Digestion Enzyme Gamete	Fertilisation Renewable Non- Renewable Physical Chemical
2	Assessment Point 1 – All content from half term 1. • **Cells and Transport** – levels of organisation, animal cells and organelles, diffusion. • **Variation** – Watson, Crick and Franklin, DNA, genes, chromosomes and heredity. • **Chemistry of the Atmosphere-** structure of the earth, the atmosphere, rocks and the rock cycle. • **Bioenergetics** – aerobic respiration.	**Introduction** to animal cells. **Y1,Y4 & Y6** how organisms are grouped together. **Y3** types of rock. **Cells** - the role of the mitochondria.	Organelle Mitochondria Ribosome Respiration Nucleus	Chromosome Atmosphere Igneous Metamorphic Sedimentary
3	• **Cells and Transport** – plant cells and organelles. • **Bioenergetics** – photosynthesis and plant adaptations. • **Atomic Structure** – introduction to atoms, elements, compounds and mixtures. • **Chemical Changes** – the rearrangement of atoms in a chemical reaction, chemical formulae and equations. • **Electricity and magnetism** – static electricity, circuit symbols, permanent magnets. • **Waves** – longitudinal and transverse waves, the human ear, amplitude, frequency and ultrasound.	**HT2 Animal cells** **Plant cells** – the role of the chloroplast **Introduction** to atomic structure. **Y5** formation of new materials being irreversible. **Y4&Y6** electric circuits. **Y3,Y4,Y6** light and sound waves.	Chloroplast Vacuole Photosynthesis Glucose Atom	Element Compound Series Parallel Current
4	Assessment Point 2 – All content from half terms 1-3. • **Atomic Structure-States of Matter and Atomic Model.** Changes of state, chemical and physical properties of elements, metals and non metals, the periodic table, chemical symbols and formulae, atomic model and subatomic particles. • **Space** – seasons, the solar system, stars and galaxies.	**HT1** particle model,**HT3** atomic structure. **Y1,Y5** the sun and planets.	Galaxy Universe Gravity Orbit	Properties Proton Neutron Electron Symbol
5	• **Atomic Structure – Separating Mixtures,** diffusion, filtration, evaporation, distillation and chromatography. • **Forces** – contact and non-contact forces, balanced and unbalanced forces, air resistance, friction and gravity.	**HT3 & HT4** atomic structure. **Y3 & Y5** contact and non contact forces.	Evaporation Distillation Filtration Chromatography Diffusion	Resultant Air resistance Friction Balanced
6	Assessment Point 3 – All content from half terms 1-5. • **Ecology** – food chains, food webs, accumulation of toxic substances and sampling techniques. • **Rates of Reaction** – collision theory, the effect of temperature and catalysts. • **Energy Changes** – exothermic and endothermic reactions.	**Y1,Y2,Y4** habitats and food chains. **HT3** chemical changes. **HT3** chemical changes **& HT6** rates of reaction.	Organism Accumulation Quadrat Sampling Ecosystem	Collision Catalyst Temperature Exothermic Endothermic

We will learn to use these command words; state, describe, calculate, define, choose, draw, give, identify, label, name, write

We will learn to develop these practical skills; control variables, risk assessments, obtaining and analysis of data.

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 8.

During this year in science we will be developing our scientific knowledge and conceptual understanding of-		This links to:	Key Vocabulary:	
1	• **Cells and Transport** – using microscopes, diffusion and osmosis, specialised cells. • **Quantitative Chemistry** – relative atomic/formula mass, conservation of mass. • **Atomic Structure** – the periodic table, group 1 and group 7. • **Energy** - energy changes and transfers, conduction, convection, radiation, power, fuel costs.	**Y7 HT2 & HT3** Cells **Y7 HT 4** atomic model **HT3** chemical changes. **Y7 HT4** atomic model. **Y7 HT1** energy	Light microscope Osmosis Specialised cells Differentiation. Conservation Properties	Groups Periods Energy stores Conduction Convection Radiation
2	• **Assessment Point 1 – All content from half term 1 + Year 7 content.** • **Infectious Disease** – unicellular organisms such as bacteria a viruses. • **Bonding** – ions and ionic bonding. • **Particle Model** – diffusion and Brownian motion. • **Chemical Changes** - pH, reactions of metals, displacement, thermal decomposition, oxidation, combustion.	**Introduction** to infectious disease. **Introduction** to bonding – links to atomic structure. **Y7 HT1** particle model **Y7 HT3** chemical changes	Unicellular Bacteria Virus Ions Diffusion	pH Neutralisation Combustion Displacement Extraction
3	• **Organisation** – gut bacteria, nutrient deficiencies, muscles, circulatory system, lungs, drugs. • **Electricity and Magnetism** – resistance, series and parallel circuits and electromagnets. • **Energy Changes** – bond energies and activation energy.	**Y7 HT1** organ systems **Y7 HT3** circuit symbols **Y7 HT6** exothermic and endothermic reactions.	Deficiency Obesity Antagonistic Breathing Recreational	Resistance Ohm's Law Electromagnets Bond energy Activation energy
4	• **Assessment Point 2 – All content from half terms 1-3 – Y7 content.** • **Bioenergetics** – anaerobic respiration. • **Space** - gravity on different planets, the light year. • **Bonding** – covalent bonds and simple covalent molecules. • **Organic Chemistry** – crude oil and alkanes.	**Y7 HT2** aerobic respiration. **Y7 HT4** the solar system **Y8 HT2** ionic bonding **Introduction** to organic chemistry	Anaerobic Lactic Fermentation Light year Weight	Covalent Crude oil Hydrocarbon Alkane
5	• **Organisation** – plant reproduction, pollination. • **Waves** – human eye, absorption and transmission, refraction, colour. • **Chemistry of the atmosphere** - carbon cycle, composition of the atmosphere, global warming.	**Y3** life cycle of flowering plants **Y7 HT3** transverse and longitudinal waves. **Y7 HT2** the Earth's Atmosphere	Pollination Fertilisation Dispersal Stigma Stamen	Carbon cycle Composition Climate Weather
6	• **Assessment Point 3 – All content from half terms 1-5 + Y7 content.** • **Variation and Ecology** – variation, natural selection, extinction, biodiversity. • **Forces** – speed, distance- time graphs, Hooke's Law, pressure in liquids. • **Using resources** – recycling, polymers, composites, ceramics	**Y7 HT2** genes and DNA **Y7 HT6** feeding relationships **Y7 HT5** contact and non contact forces. **Introduction** to using resources.	Continuous Discontinuous Species Natural selection Evolution	Extinction Moments Pressure Polymer Ceramics

We will learn to use these command words; state, describe, calculate, define, choose, draw, give, identify, label, name, write, compare, explain, determine, justify, plan, predict, evaluate, suggest.

We will learn to develop these practical skills; control variables, risk assessments, obtaining and analysis of data, planning.

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 9.

During this year in science we will be developing our scientific knowledge and conceptual understanding of-		This links to:	Key Vocabulary:	
1	**Atomic Structure, the Periodic Table and Quantitative Chemistry 1** • Separation techniques, subatomic particles, history of the atom, the periodic table and its history. • Conservation of mass, balancing equations, RFM and RAM. **Assessment Point 1 – Atomic structure + Y7 & Y8 content.** **Space** • Stars, the universe and our solar system. (the Big Bang and red shift)	**Y7 HT4 & Y8 HT1** – atomic structure. and **Y8 HT1** quantitative chemistry. **Y7 HT5** the solar system **Y8 HT4** gravity & the light year.	Proton Neutron Electron Isotope RAM	Conservation RFM Supernova Satellite Lifecycle
2	**Cells and Transport** • Cell structure and function, organelles, magnification, transport of substances, cell division, stem cells **RP – Magnification, RP – Osmosis.** **Particles Model-** • Density, changes of state, internal energy and particle motion. **RP- Density.**	**Y7 HT2&3** animal and plant cells. **Y8 HT1** microscopes, diffusion, osmosis & specialised cells. **Y7 HT1** the particle, states of matter, changes of state. **Y8 HT2** Brownian motion.	Nucleus Mitochondria Ribosomes Osmosis Mitosis	Chromosome Differentiation Density Motion Irregular
3	**Assessment Point 2 All Y9 HT1-2 content & synoptic section.** **Bonding** • Metallic bonding, alloys, ionic bonding, giant ionic structures, covalent bonding, simple covalent molecules, giant covalent structures and polymers.	**Y8 HT2** ions and ionic bonding **Y8 HT4** covalent bonding	Metallic Covalent Ionic Properties Structure	Ion Delocalised Graphite Diamond Polymer
4	**Energy Changes** • Endothermic and exothermic reactions and bond energies. **RP – Energy changes.** **Atomic Structure (physics)** • Structure of the atom and its development, nuclear radiation and decay, half life.	**Y7 HT6** exothermic and endothermic reactions. **Y8 HT3** bond energies and activation energy. **Y7 HT4, Y8 HT1, Y9 HT1** chemistry atomic structure.	Endothermic Exothermic Enthalpy Bond energy	Alpha Beta Gamma Half life Radioactive
5	**Assessment Point 2 All Y9 HT1-4 content & synoptic section.** **Chemical Changes** • Redox reactions, metals and acids, extraction of metals, neutralisation and electrolysis. **RP- Making salts, RP-Electrolysis.** .	**Y7 HT3** rearrangement of atoms, **Y8 HT** reaction of metals, oxidation and displacement.	Oxidation Reduction Extraction Neutralisation	Electrolysis Ion Salt Solution
6	**Infectious Disease** • Viruses, bacteria, fungal diseases, malaria, white blood cells, vaccinations, antibiotics, medicines and development of new drugs.	**Y9 HT2** cells **Y8 HT2** bacteria and viruses.	Virus Bacteria Protist Vaccination Antibodies	Antibiotics Lymphocytes Phagocytes Phagocytosis

Target Grade:		AP1:		AP2:		AP3:	