Year 7	Year 8	Year 9
Introduction - Hazards and Safety - Science equipment - Science investigations – variables, risk assessment, drawing a results table, drawing a line graph, writing a conclusion **Cells & Theories** **- '**MRS GREN' - Identification of the different parts of animal and plant cells and their functions - Use of microscope - Specialised cells and functions -Cell division including mitosis - Single celled organisms including microbes - Tissues and organs -Names and functions of plant cells -Photosynthesis and respiration in plants **Particle & Models** - Scientific ideas that have changed over time to make new observations - Properties of solids, liquids and gases - Particle model of solids, liquids and gases - Change of state - Particle theory and change of state	**Food, Digestion & Graphs** - Identifying food groups - Describing food tests and making observations - Balanced diet and analysing nutritional content in a meal - Poor diets and health risks including obesity, starvation and deficiency diseases - Parts of the digestive system and how food is digested - How food is absorbed in the small intestine and the structure of the villi - Function of enzymes - Effect of temperature and pH on enzymes	**Inheritance & Theories** - Reproduction in humans - Genes, chromosomes and DNA structure - Variation between organisms - Gregor Mendel and monohybrid crosses - Natural selection - Biodiversity and maintaining biodiversity - Extinction and reasons why species become extinct - Sampling techniques and estimating population sizes

- Pressure - Diffusion - Pure or mixture - Filtration - Crystallisation - Distillation - Chromatography		
Forces & Graphs - Introduction to forces - Floating, sinking and upthrust - Stretching materials and Hookes's law - Deformation and compression - Friction - Balanced and unbalanced forces - Calculating and measuring speed and stopping distances **Reproduction** - Structure of a flower - Insect and wind pollination – Seed and fruit formation - Seed dispersal and its effectiveness - Human reproductive systems & fertilisation - Pregnancy and the role of the placenta - Puberty in boys and girls	**Reactions** - Physical or chemical - Revision of atoms and ions - Revision of bonds and chemical formula - Word equations - Symbol equations - Balancing equations - Burning - Metal and oxygen - Exothermic and endothermic reactions - Catalysts **Heating, Cooling & Reliability** - Difference between temperature and energy - Interpreting cooling curves - Conduction - Expansion and contraction, and application to real life designs - Convection - Radiation - Change of state - Evaporation - Insulation and how insulators reduce conduction, convection and radiation - Brownian motion	**Metals** - Revision of elements and compounds - Revision of the periodic table - Properties of metals and non-metals (including ceramic, polymers, and composites) - Alloys - Nano and SI units - Revision of word and symbol equations - Reactivity series - Extraction of metals - Displacement reactions - Rusting - Thermal decomposition **Energy & Numeracy** - Energy stores and the law of conversation - Energy changes - Energy transformations (Energies at the start and end of a transformation) - Sankey diagrams and efficiency - Calculating power - Reducing heat loss in homes - Calculating payback times

Atoms - Structure of the atom - Atomic mass and calculating % mass - Periodic table - Elements - Electron structure - Ions - Compounds - Chemical bonds - Working out chemical formulae	**Circulation & Respiration** - Structure and function of the lungs - Gas exchange system - Naming and describing the organs in the circulatory system - The skeleton, joints and muscles - Aerobic respiration - Comparing inhaled and exhaled air - Anaerobic respiration and fermentation - Smoking and its effects - Alcohol and its effects - Measuring reaction time - Illegal drugs - Testing new drugs and ethical issues with animal testing **Acids** - Acids and alkalis - pH scale - Indicators - Neutralisation - Base/alkali + acid - Metal + acid - Metal carbonate + acid	**Forces, Pressure, Moments & Patterns** - Revision of forces - Balanced forces - Motion (changed direction and speed) - Calculating speed - Distance time graphs and velocity time graphs - Terminal velocity - Relative motion - Pressure and calculating pressure - Pressure in liquids and gases - Levers - Machines - Moments

	Earth, Space & Theories - Naming the three different types of rocks and how they are formed - Describing physical and chemical weathering - Naming parts of the Earth and describing the composition of each part - Naming the gases in the air and explaining why the composition has changed over time - Day and night - Seasons - Differences between mass and weight - Calculating mass and weight - Explaining how distance affects orbit time - Different models of the solar system - The Sun, galaxies and the Universe	
Electricity & Reliability - Circuit symbols and circuits - Measuring current - Measuring voltage - Measuring resistance - Series circuits - Parallel circuits - Fruit cells - Static Electricity - Dangers of electricity - Plugs & fuses	**Light** - Luminous and non – luminous objects - Opaque, transparent and translucent objects - How a shadow is formed - Use of a ray diagram to explain the path of light - Transverse waves and how waves can be super positioned - Reflection and mirrors - Law of reflection	**Equations & Planning** - Conservation of mass and word equations - Rusting and factors affecting rusting - Thermal decomposition - The reactivity series - Displacement reactions - Extraction of metals using carbon - Reaction of acids and bases - Reaction of acids and metals

	- Lateral inversion and virtual images - Refraction and application of refraction to lenses - Parts of the eye and their functions - Focussing of light through a convex lens - Formation of an object on a pinhole camera - Dispersion - Primary and secondary colours and explaining why different objects look different colours - Use of light in communication	- Neutralisation reactions - Reaction of acids with metal carbonates - Exothermic and endothermic reactions - Energy changes during a reaction - Catalysts - Neutralisation energy changes El**ectricity & Reliability** - Properties of magnets - Magnetic fields - Electromagnets - DC Motors - Voltage - Series and parallel circuits - Resistance and calculating resistance - Renewable and non-renewable energy sources - Generating electricity
Energy & Numeracy - Types of energy stores and the 4 transfer mechanisms - Drawing and interpreting energy transfer diagrams - Energy change (Conversion of units and comparison of energy at the start and end of a system) - Interpreting and drawing Sankey diagrams and calculating efficiency - Renewable and non-renewable energy resources,	**Microbes, Diseases & Patterns** - Microbes and how they are different to animal and plant cells - Categorisation of microbes using the 5 kingdom system - Estimation of the size of microbes - Uses of microbes (fermentation) - Aseptic techniques for growing bacteria - Work of Semmelweiss	**GCSE START: Cells** Cells Microscopy and magnification Primitive cells Specialised cells Chromosomes Mitosis Stem cells Diffusion Osmosis Active transport

including advantages and disadvantages - Application of equations to calculate the cost of electricity	- Naming particular diseases and how they are spread - Role of white blood cells - Vaccination - Antibiotics - History of disease **Sound & Numeracy** - Definition of sound and how it is created - Sound as a longitudinal wave - Pitch, frequency and amplitude - Calculating the speed of sound - Echoes - Parts of the ear and how we hear - Effect of loudness on hearing - Ultrasound and ethics of the mosquito sound box	
Ecology, Variation & explaining patterns - Variation between species and measuring variation - Adaptations of plants and animals - Adaptations to feeding of animals - Changes to habitats - Food chains and food webs - Evidence for food webs - Classification and understanding how to interpret a key - Classification of vertebrates	**Ecology & Planning** - Photosynthesis - Limiting factors affecting photosynthesis - Animal classification - Different sampling methods - Sampling using a quadrat - Pyramid of numbers and pyramid of biomass - Bioaccumulation - Physical factors which affect the environment (abiotic factors) - Living factors and populations (biotic factors)	**GCSE Atoms** Atomic structure Atomic theory changes Periodic table Elements and compounds Word and symbol equations Mixtures and separation Metals and non-metals Group 1 Group 0 Group 7 Transition metals (C)

- Classification of invertebrates - Classification of plants - Behaviour (Innate and learned)		