Year 7 – Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Introduction Lessons**	• Risk assessment – identifying risks in the lab and taking steps to prevent them. • Use working scientifically skills to learn how to use common lab equipment.	• How do we stay safe in a school laboratory? • How do we use common measuring equipment?	Risk, hazard, Bunsen burner, conical flask, measuring cylinder, beaker, tripod, gauze.
	Cells and movement	• Using a microscope to observe, interpret and record cell structure • Use working scientifically skills to observe diffusion • Developing comparison skills. • Method writing.	• What are living things made of? • How are the building blocks adapted to be able to carry out their functions? • How do bacterial cells differ from plant and animal cells?	Nucleus, cytoplasm, cell membrane Chloroplast, vacuole, cell wall, prokaryote, Magnification, diffusion, muscle, bone, joints, antagonistic,
	Particles and separating mixtures	• Use working scientifically skills to separate mixtures. • Method writing. • Risk assessment – identifying risks in investigations and taking steps to prevent them. • Maths skills – graph drawing • Interpretation of graphical data	• How do particles behave in solids, liquids and gases? • How can we separate mixtures for different purposes?	Solids, liquids, gases, evaporation, condensation, melting, freezing, sublimation, state, mixture, chromatography, filter, pure, solubility, distillation.
Half term 2	**Light and sound**	• Use working scientifically skills to investigate properties of light. • Maths skills - Use a protractor to measure angles. • Drawing and interpreting wave diagrams	• How do we hear sounds? • Why are there some sounds we cannot hear? • How are we able to observe the world? • Why do we see different colours?	Waves, longitudinal, transverse, wave speed, loudness, amplitude, frequency, pitch, period, ear drum, cochlea, ossicles, reflection, refraction, retina, pupil, iris, optical nerve.

	Energy cost and transfer	• Maths skills – Using equations to solve problems with the help of HESSU. • Method writing/planning. • Maths skills – graph drawing • Interpretation of graphical data • Developing comparison skills by comparing energy resources.	• What is work done? • How much energy do we get from our food? • Which methods of generating energy are the best and why?	Energy stores and pathways, power, work, combustion, renewable, non-renewable, global warning, greenhouse gases
Half term 3	**Reactions of acids and alkalis and reactions of metals and non-metals**	• Use working scientifically skills to investigate chemical reactions. • Writing word and symbol equations. • Interpretation of data • Making conclusions • Development of evaluation skills.	• What are acids and alkalis? • What happens to chemicals when they react?	Acids, alkalis, neutralisation, pH, indictor, salts, metals, non-metals, displacement
	Variation and human reproduction.	• Use working scientifically skills to investigate characteristics • Maths skills – graph drawing • Development of evaluation skills	• What is variation? • How do humans reproduce? • What happens during pregnancy and birth? • How can pregnancy and STI's be prevented?	Continuous and discontinuous variation, adaptation, surface area: volume ratio, gamete, fertilisation, puberty, adolescence Menstrual cycle.
Half term 4	**British Science week**	• Dependent on theme of the year	• Dependent on theme of the year	Dependent on theme of the year
	Magnets and electromagnets	• Use working scientifically skills to investigate electromagnets. • Method writing/planning. • Maths skills – graph drawing • Making conclusions	• How do magnets work? • How can magnets be made to be more useful to us? • How can the strength of an electromagnet be altered?	Magnet, pole. North, south, compass, electromagnet, current, solenoid.
Half term 5	**Forces**	• Maths skills – Using equations to solve problems with the help of HESSU. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Making conclusions	• What are forces and how do they affect objects? • How does distance and time affect the motion of objects?	Speed, velocity, friction, drag, weight, normal contact force, air resistance, gravity, mass.

	Interdependence and plant reproduction	• Draw food chains. • Use working scientifically skills to investigate seed dispersal. • Development of evaluation skills • Method writing/planning. • Making conclusions	• What is interdependence? • How do adaptations help organisms survive? • How do plants reproduce?	Food chains, webs, energy, Interdependence, competition, predator, prey, pollination, germination, dispersal
Half term 6	**Earth structure and universe**	• Use working scientifically skills to investigate viscosity and crater sizes. • Developing comparison skills. • Development of evaluation skills • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Making conclusions • Create a scale model of the solar system. • Use models to represent rocks and the rock cycle. • Explain how models help us understanding the structure of the Earth.	• What makes up the atmosphere? • How are different types of rock made? • Why do rocks have different properties? • What makes up our solar system? • Why do we have day/night and the seasons?	Core, mantle, crust, gravity, sedimentary, igneous, metamorphic, solar system, planets, Earth, Moon, Satellites, viscosity.
	STEM Project To be decided by classroom teacher from a range of topics.	• Dependent on STEM project – based heavily on developing working scientifically skills.	• Dependent on STEM project	Dependent on STEM project

Year 8 – Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Breathing and digestion**	• Use working scientifically skills to investigate biological molecules in food (food tests). • Use models to look at movement of gases in and out of the lungs • Developing comparison skills. • Development of evaluation skills • Method writing/planning. • Interpretation and analysis of data	• How do we breathe? • How is the body adapted for effective gas exchange? • What effects does smoking and alcohol consumption have on our body? • What constitutes a healthy diet? • How do we know which molecules are in our food? • How does the digestive system work?	Diffusion, alveoli, alcohol, smoking, stomach, pancreas, small intestine, enzyme, active site, substrate, denature, protein, carbohydrates, lipids, Benedict's solution, Biuret solution, ethanol, Iodine solution.
	Space week	• Dependent on National focus each year.	• Dependent on National focus each year.	Dependent on National focus each year.
	Elements and the periodic table	• Use working scientifically skills to investigate polymers. • Developing comparison skills. • Development of evaluation skills • Maths skills – graph drawing • Interpretation of data – graphical • Making conclusions • Use of models/timelines.	• What are atoms, elements, compounds and mixtures? • Why do different materials have different properties? • What are polymers? • What is the periodic table and how has it changed over time?	Elements, compounds, mixtures, Periodic Table, atoms, Alkali metals, Halogens, Displacement, Noble Gases, polymers, chemical formulae
Half term 2	**Electricity**	• Use working scientifically skills to investigate resistance in a circuit. • Maths skills – Using equations to solve problems with the help of HESSU. • Development of evaluation skills • Method writing/planning. •	• What is electricity? • How does resistance affect electrical circuits? • What is static electricity?	Series, parallel, current, potential difference, resistance, amps, volts, ohms, electrons, static.
Half term 3	**Evolution and inheritance.**	• Use of modelling to determine DNA structure • Development of evaluation skills	• Why do we look the way we do? • What is evolution and who is Charles Darwin? • What evidence do we have that Natural Selection drives evolution? • What is biodiversity?	Chromosome, gene, DNA, natural selection, Darwin, evolution, biodiversity, pollution, deforestation

			• How do humans affect the planet?	
	Chemical energy and types of reactions	• Use working scientifically skills to investigate fuels and endo/exothermic reactions. • Development of evaluation skills • Developing comparison skills. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Making conclusions • Draw reaction profile diagrams for exothermic and endothermic reactions. • Maths skills – Calculate energy changes within a reaction.	• What happens when fuels burn? • What is conservation of mass? • What energy transfers happen within chemical reactions? •	Combustion, thermal decomposition, conservation, endothermic exothermic, bond
Half term 4	**Work, heating and cooling**	• Use working scientifically skills to investigate conduction and convection, and infrared radiation. • Maths skills – Using equations to solve problems with the help of HESSU. • Developing comparison skills. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Making conclusions	• What is work done? • What is the difference between heat and temperature? • How is heat energy transferred? • How does a thermos keep your tea hot and your water cold?	Work done, conduction, convection, temperature, thermal, radiation, insulation.
	British science week	• Dependent on National focus each year.	• Dependent on National focus each year.	Dependent on National focus each year.
	Climate and earth resources	• Use working scientifically skills to investigate the best materials to use for a bag and the reactivity of metals. • Developing comparison skills. • Development of evaluation skills • Method writing/planning. • Making conclusions • Modelling of the carbon cycle	• How has the Earth's atmosphere changed over time? • How will global warming and climate change affect me? • How do we extract and use the Earth's resources? • How can we prevent overuse of Earth's resources?	Global warming, carbon cycle, photosynthesis, respiration, atmosphere, greenhouse, metals, reduction, electrolysis, ceramics, metal ores

Half term 5	**Respiration and photosynthesis**	• Use working scientifically skills to investigate respiration and photosynthesis. • Developing comparison skills. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Development of evaluation skills	• How do organisms get the energy they need to survive? • How does exercise affect the body? • How do plants make their own food? • How are plants adapted to make their own food?	Ecosystem, Photosynthesis, aerobic respiration, anaerobic respiration, lactic acid, oxygen, carbon dioxide, glucose, chlorophyll, chloroplasts, light, starch, epidermis, palisade mesophyll, spongy mesophyll, xylem, phloem, guard cells, stomata.
Half term 6	**Contact forces and pressure**	• Use working scientifically skills to investigate friction, floating and sinking, forces on springs and moments. • Maths skills – Using equations to solve problems with the help of HESSU. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data	• How do forces affect objects? • Why is friction important? • What are moments? • Why do deep sea explorers need submarines and why do balloons burst when they get too high?	Friction, drag, stretch, squash, moments, torque, pressure, collisions, density, stress

Year 9 – Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Cells and organisation**	• Using a microscope- magnification calculation • Use working scientifically skills to investigate factors affecting diffusion, osmosis, and enzymes. • Maths skills - Calculate % change. • Method writing/planning • Developing comparison skills. • Development of evaluation skills • Making conclusion • Modelling processes	• What is the difference between prokaryotic and eukaryotic cells? • How do cells obtain what they need? • How are living things organised? • What are enzymes and how do they help with digestion? • How do we know what food molecules are in our food? • How does the circulatory system work? • How are plants organised? • How do plants transport substances?	Eukaryotic/prokaryotic, stem cells, magnification, mitosis, diffusion, osmosis, enzyme, atria, ventricle, arteries, veins, capillaries, mesophyll, xylem, phloem
	Atomic structure and the periodic table	• Using models. • Interpretation of data and identifying patterns. • Evaluation of evidence over time. • Draw atoms – electronic structure • Use working scientifically skills to separate mixtures.	• How have the ideas around the periodic table and the structure of the atom changed over time? • What makes up an atom? • How does the structure of atoms affect their chemical properties? • How do we separate mixtures based on their properties?	Elements, compounds, mixtures, Periodic Table, atoms, Alkali metals, Halogens, Displacement, Noble Gases, protons, electrons, neutrons
Half term 2	**Energy**	• Use working scientifically skills to investigate specific heat capacity and thermal insulation. • Maths skills – Using equations to solve problems with the help of HESSU. • Developing comparison skills. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data	• How can we work out the energy stored in different stores? • On a hot, sunny day, why is the sand hotter than water? • Why do we need to move to more renewable energy resources? • What effect does insulation have on heat transfer?	Stores, pathways, kinetic, elastic, gravitational, specific heat capacity, efficiency, renewable, non-renewable, biomass, geothermal, hydroelectric, waves, tidal, wind, solar, fossil fuels, nuclear
Half term 3	**Respiration and photosynthesis**	• Use working scientifically skills to investigate respiration and photosynthesis. • Developing comparison skills. • Method writing/planning.	• How do organisms get the energy they need to survive? • How does exercise affect the body? • Why is formation used in brewing and baking?	Ecosystem, Photosynthesis, aerobic respiration, anaerobic respiration, fermentation, lactic acid, oxygen, carbon dioxide, glucose, ethanol, chlorophyll, chloroplasts, light,

		• Maths skills – graph drawing • Interpretation of data – graphical • Development of evaluation skills	• How do plants make their own food? • How are plants adapted to make their own food? • What is metabolism?	limiting factor, starch, epidermis, palisade mesophyll, spongy mesophyll, xylem, phloem, guard cells, stomata, iodine solution, metabolism, anabolic, catabolic
	Atomic structure and nuclear radiation	• Using models. • Interpretation of data – half life graphs. • Developing comparison skills.	• What makes up an atom? • What are the properties of different types of nuclear radiation? • What happens to radioactive isotopes over time? • How can we make use of radioactive isotopes?	Proton, neutron, electron, energy level, alpha, beta, gamma, ionisation, irradiation, contamination, half-life.
Half term 4	**Energy changes**	• Use working scientifically skills to investigate changes of temperature during a reaction. • Drawing reaction profiles. • Method writing/planning. • Maths skills – graph drawing • Interpretation of data – graphical • Use bond energies to calculate enthalpy change (HT only)	• How is energy transferred in reactions? • What happens to the temperature of a reaction over time?	Endothermic, exothermic, reaction profiles, thermal decomposition, combustion, bonds, enthalpy, activation energy
	Particle Model of matter and density.	• Use working scientifically skills to investigate ways to calculate density. • Maths skills – Using equations to solve problems with the help of HESSU. • Method writing/planning. • Interpretation of data – graphical	• How can we calculate the density of an irregular object e.g. a statue? • What happens during a change of state?	Density, solid, liquid, gas, mass, volume, heat, temperature, internal energy, specific latent heat, pressure, work done.
Half term 5	**Chemistry of the atmosphere**	• Using models. • Interpretation of data • Making conclusions. • Maths skills - Calculate carbon footprint • Balance chemical equations	• How has our atmosphere changed? • What impact does human activity have on our atmosphere?	Greenhouse, global warming, methane, water vapour, carbon dioxide, pollutants, carbon footprint, peer-reviewed

	Ecology	• Use working scientifically skills to investigate ways to sample populations of organisms (and the effect of decay).
		• Method writing/planning.
			• How would you estimate:
			  ○ The population of daisies in a field?
			  ○ The distribution of organisms?
				Interdependence, pollination, decay, biodiversity, pollution, biotechnology, quadrat, transect, population, community,

		• Maths skills – graph drawing • Interpretation of data – graphical • Maths skills – calculating population sizes. • Development of evaluation skills • Using models. • Interpretation of data • Making conclusions.	• How is carbon recycled between the living and non-living world? • Why is decay essential for life? • How are humans affecting biodiversity? • How can we ensure the world has access to enough good quality food?	ecosystem, habitat, precipitation, transpiration, drainage, predator, prey, producer, trophic level, biomass, carbon dioxide, methane, peat bog, deforestation, global warming, quotas, fish farming, battery/intensive farming, mycoprotein.
Half term 6	Revision for assessment	• Dependent on needs of each class	• Dependent on needs of each class	Dependent on needs of each class

	Ecology	• Use working scientifically skills to investigate ways to sample populations of organisms (and the effect of decay).
		• Method writing/planning.
		• Maths skills – graph drawing
		• Interpretation of data – graphical
		• Maths skills – calculating population sizes.
		• Development of evaluation skills
		• Using models.
		• Interpretation of data
		• Making conclusions.
			• How would you estimate:
			  ○ The population of daisies in a field?
			  ○ The distribution of organisms?
			• How is carbon recycled between the living and non-living world?
			• Why is decay essential for life?
			• How are humans affecting biodiversity?
			• How can we ensure the world has access to enough good quality food?
				Interdependence, pollination, decay, biodiversity, pollution, biotechnology, quadrat, transect, population, community, ecosystem, habitat, precipitation, transpiration, drainage, predator, prey, producer, trophic level, biomass, carbon dioxide, methane, peat bog, deforestation, global warming, quotas, fish farming, battery/intensive farming, mycoprotein.

	STEM Project To be decided by classroom teacher from a range of topics.	• Dependent on STEM project –based heavily on developing working scientifically skills.	• Dependent on STEM project	Dependent on STEM project

Year 10 – Trilogy Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Cell biology**	• Using a microscope- magnification calculation • Use working scientifically skills to investigate factors affecting diffusion and osmosis. • Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills - Calculate % change. • Method writing/planning • Developing comparison skills. • Development of evaluation skills • Making conclusion • Modelling processes	• What is the difference between prokaryotic and eukaryotic cells? • Why are microscopes so important? • How do cells obtain what they need? • How can cells be used to treat medical conditions?	Eukaryotic/prokaryotic, stem cells, magnification, mitosis, diffusion, osmosis.
	Structure and Bonding	• Draw dot and cross diagrams for covalent compounds. • Model different types of bonding. • Interpretation of data	• How does the structure and bonding within substances give rise to different properties? • How are alloys different to metals?	Covalent, ionic, metallic, solid, liquid, gas, diamond, graphite, graphene, fullerene, alloys, polymers.
	Electricity (into half term 2)	• Maths skills – Using equations to solve problems with the help of HESSU. • Use working scientifically skills to investigate resistance and current-voltage characteristics of several components • Method writing/planning • Making conclusion • Graph drawing	• How do your electrical devices work? • Why do we connect components in series and parallel? • How do we get electricity to our homes? • What helps keep us safe when using electricity? • Why do birds like sitting on power cables and why don't they get shocked?	Charge, current, potential difference, resistance, coulombs, amperes, volts, ohms, static, cells, switch, ammeter, voltmeter, resistor, bulb, series, parallel, ohmic, non-ohmic. Variable resistor, thermistor, LDR, diode, LED, fuse, earthing, national grid, transformers.
Half term 2	**Infection & Response**	• Interpret data and evaluate evidence about new drugs, vaccinations • Use models • Application of knowledge	• What is a pathogen? • How does the body protect itself from pathogens? • How can we prevent and treat disease? • Why is antibiotic resistance such a concern?	Pathogen, bacteria, virus, fungi, protist, white blood cell-phagocytosis, antibody, antitoxin Vaccine, antibiotic, placebo, double blind trial.

	Quantitative Chemistry (into half term 3)	• Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills - Calculate RFM and use moles to calculate different variables (HT only) • Balance chemical equations	• How are chemical equations used to communicate chemical ideas? • What is a mole? (HT only)	Relative formula mass, conservation, chemical formulae, balance, moles, concentration, Avogadro's constant.
Half term 3	**Chemical changes**	• Use working scientifically skills to investigate making salts from different acids and alkalis and electrolysis of ionic compounds. • Method writing/planning • Making conclusion • Evaluation skills	• How are metals extracted from their ores? • What is neutralisation? • How are ionic compounds split into their component elements?	Metals, reactivity, reduction, oxidation, strong, weak, salts, acids, base, electrolysis, electrolyte, anode, cathode, molten, aqueous, ionic
Half term 4	**Revision**	• Dependent on needs of each class.	• Dependent on needs of each class.	Dependent on needs of each class.
Half term 5	**Using Resources**	• Use working scientifically skills to investigate purification of water. • Evaluation skills • Comparison skills	• How can we use the Earth's recourses sustainably? • How do we obtain drinking water? • How do we assess the impact of products on the environment?	Water, pure, potable, sewage, filter, sterilisation, microbes, pH, LCA, recycling
	Forces (into half term 6)	• Use working scientifically skills to investigate Hooke's law and Newton's second law. • Maths skills – Using equations to solve problems with the help of HESSU. • Use of protractors to resolve vector forces. • Method writing/planning • Making conclusion • Graph drawing • Interpreting velocity-time and distance-time graphs.	• How do forces affect objects? • What is Hooke's law? • How do speed and acceleration affect objects? • Why do we need speed limits? • What happens during a skydive? • What is momentum and how does it affect objects?	Vector, scalar, contact, non-contact, resolving, balanced, equilibrium, resultant force, extension, spring constant, elastic, plastic, limit of proportionality, displacement, acceleration, stationary, stopping distance, thinking distance, braking distance, air resistance, drag, terminal velocity, collisions, explosions, momentum, conservation of momentum.
	Chemical analysis	• Use working scientifically skills to investigate chromatography and gas tests. • Method writing/planning	• Is orange juice pure? • How do we separate soluble substances using chromatography? • How can we tell the identity of a gas?	Pure, impure, formulation, chromatography, mobile phase, stationary phase, soluble, insoluble, solvent, oxygen,

		• Making conclusion • Maths skills – measuring and calculating Rf values.		hydrogen, carbon dioxide, hydrogen.
Half term 6	**Revision**	• Dependent on needs of each class.	• Dependent on needs of each class.	Dependent on needs of each class.
	Homeostasis and response	• Use working scientifically skills to investigate reaction time. • Comparison skills – nervous and endocrine • Method writing/planning • Making conclusion • Evaluation of contraceptive methods.	• How are conditions in the body controlled? • What can affect reaction times? • How do we prevent pregnancy? • How can infertility be treated? (HT only)	Stimulus, receptor, effector, response, neurone, synapse, reflex arc, insulin, glucagon (HT), FSH, LH, Oestrogen and progesterone, Puberty, menstrual cycle, Contraceptive
	Organic Chemistry	• Use a general formula to determine the molecular formula of different alkanes. • Use a chemical test to identify alkanes from alkenes • Comparison skills • Method writing/planning • Balancing equations.	• How to we obtain useful products from crude oil? • Why is it important to use crude oil in a sustainable way? (Links to Using Resources)	Crude oil, hydrocarbons, fractional distillation, cracking, alkanes, alkenes, combustion

Year 10 – Triple Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Cell biology**	• Using a microscope- magnification calculation, osmosis and culturing micro-organisms. • Use working scientifically skills to investigate factors affecting diffusion and osmosis. • Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills - Calculate % change. • Method writing/planning • Developing comparison skills. • Development of evaluation skills • Making conclusion • Modelling processes	• What is the difference between prokaryotic and eukaryotic cells? • Why are microscopes so important? • How do cells obtain what they need? • How can cells be used to treat medical conditions? • How do we grow bacteria safely in a lab?	Eukaryotic/prokaryotic, stem cells, magnification, mitosis, diffusion, osmosis, aseptic technique, sterilisation, inoculation loop.
	Structure and Bonding	• Draw dot and cross diagrams for covalent compounds. • Model different types of bonding. • Interpretation of data	• How does the structure and bonding within substances give rise to different properties? • How are alloys different to metals?	Covalent, ionic, metallic, solid, liquid, gas, diamond, graphite, graphene, fullerene, alloys, polymers.
	Electricity (into half term 2)	• Maths skills – Using equations to solve problems with the help of HESSU. • Use working scientifically skills to investigate resistance and current-voltage characteristics of several components • Method writing/planning • Making conclusion • Graph drawing	• How do your electrical devices work? • Why do we connect components in series and parallel? • How do we get electricity to our homes? • What helps keep us safe when using electricity? • Why do birds like sitting on power cables and why don't they get shocked? • What is static electricity and why can it give us a shock?	Charge, current, potential difference, resistance, coulombs, amperes, volts, ohms, static, cells, switch, ammeter, voltmeter, resistor, bulb, series, parallel, ohmic, non-ohmic. Variable resistor, thermistor, LDR, diode, LED, fuse, earthing, national grid, transformers, static, insulator, conductor, discharge.
Half term 2	**Infection & Response**	• Interpret data and evaluate evidence about new drugs, vaccinations • Use models • Application of knowledge	• What is a pathogen? • How does the body protect itself from pathogens? • How can we prevent and treat disease?	Pathogen, bacteria, virus, fungi, protist, white blood cell-phagocytosis, antibody, antitoxin

			• Why is antibiotic resistance such a concern? • What are monoclonal antibodies and how are they being used as treatment? • How do plants defend themselves against pests and disease?	Vaccine, antibiotic, placebo, double blind trial, monoclonal antibodies, myeloma, hybridoma, lymphocyte.
	Chemical changes (into half term 3)	• Use working scientifically skills to investigate making salts from different acids and alkalis and electrolysis of ionic compounds. • Method writing/planning • Making conclusion • Evaluation skills	• How are metals extracted from their ores? • What is neutralisation? • How are ionic compounds split into their component elements?	Metals, reactivity, reduction, oxidation, strong, weak, salts, acids, base, electrolysis, electrolyte, anode, cathode, molten, aqueous, ionic
	Forces (into half term 3 and 4)	• Use working scientifically skills to investigate Hooke's law and Newton's second law. • Maths skills – Using equations to solve problems with the help of HESSU. • Use of protractors to resolve vector forces. • Method writing/planning • Making conclusion • Graph drawing • Interpreting velocity-time and distance-time graphs.	• How do forces affect objects? • What is Hooke's law? • What is a moment? • How do speed and acceleration affect objects? • How does pressure affect liquids and gases? • Why do we need speed limits? • What happens during a skydive? • What is momentum and how does it affect objects?	Vector, scalar, contact, non-contact, resolving, balanced, equilibrium, resultant force, extension, spring constant, elastic, plastic, limit of proportionality, displacement, acceleration, stationary, stopping distance, thinking distance, braking distance, air resistance, drag, terminal velocity, collisions, explosions, momentum, conservation of momentum, moment, lever, pivot, pressure.
	Quantitative Chemistry (into half term 3)	• Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills - Calculate RFM and use moles to calculate different variables (HT only) • Balance chemical equations	• How are chemical equations used to communicate chemical ideas? • What is a mole? (HT only) • How can moles be used to calculate masses, percentages yield, atom economy and balance equations?	Relative formula mass, conservation, chemical formulae, balance, moles, concentration, Avogadro's constant, atom economy, percentage yield.
Half term 3	**Using Resources**	• Use working scientifically skills to investigate purification of water. • Evaluation skills • Comparison skills	• How can we use the Earth's recourses sustainably? • How do we obtain drinking water? • How do we assess the impact of products on the environment?	Water, pure, potable, sewage, filter, sterilisation, microbes, pH, LCA, recycling, corrosion, ceramics, composites, polymers, Haber process, ammonia,

			• What is corrosion and how can it be prevented? • What is the Haber process and how is it useful?	
	Homeostasis and response (into half term 4)	• Use working scientifically skills to investigate reaction time and phototropism. • Comparison skills – nervous and endocrine • Method writing/planning • Making conclusion • Evaluation of contraceptive methods.	• How are conditions in the body controlled? • What can affect reaction times? • How do we correct long and short sightedness? • How do we prevent pregnancy? • How can infertility be treated? (HT only) • How does the body control water levels? • What is dialysis? • How do plants respond to a stimulus?	Stimulus, receptor, effector, response, neurone, synapse, reflex arc, insulin, glucagon (HT), FSH, LH, Oestrogen and progesterone, Puberty, menstrual cycle, Contraceptive, retina, lens, ciliary muscle, hypothalamus, pituitary gland, ADH, kidney, renal, thermoregulation, germination, phototropism, gravitropism.
Half term 4	**Chemical analysis**	• Use working scientifically skills to investigate chromatography and gas tests. • Method writing/planning • Making conclusion • Maths skills – measuring and calculating Rf values.	• Is orange juice pure? • How do we separate soluble substances using chromatography? • How can we tell the identity of a gas?	Pure, impure, formulation, chromatography, mobile phase, stationary phase, soluble, insoluble, solvent, oxygen, hydrogen, carbon dioxide, hydrogen.
	Revision	• Dependent on needs of each class.	• Dependent on needs of each class.	Dependent on needs of each class.
	Energy changes	• Application of knowledge and skills	• How do cells and batteries work?	Cell, battery, hydrogen, energy, fuel cell.
Half term 5	**Magnetism**	• Use working scientifically skills to investigate permanent and induced magnets and electromagnets. • Method writing/planning • Making conclusion • Maths skills – Using equations to solve problems with the help of HESSU. •	• Why do paper clips stick to magnets but drinks cans not? • How could you used a wire and a magnet to generate electricity? • Why do motors move? • How do speakers and microphones work?	Permanent magnet, induced magnet, attract, repel, solenoid, electromagnet, motor effect, coil, magnetic flux density, split ring commutator, generator, transformer, induction.
	Organic Chemistry	• Use a general formula to determine the molecular formula of different alkanes.	• How to we obtain useful products from crude oil?	Crude oil, hydrocarbons, fractional distillation, cracking,

		• Use a chemical test to identify alkanes from alkenes • Comparison skills • Method writing/planning • Balancing equations.	• Why is it important to use crude oil in a sustainable way? (Links to Using Resources) • How are organic molecules used to make a variety of materials such as polymers, pharmaceuticals, perfumes and flavourings?	alkanes, alkenes, combustion, alcohols, carboxylic acids, esters, addition polymers, condensation polymers, DNA
Half term 6	**Revision**	• Dependent on needs of each class.	• Dependent on needs of each class.	Dependent on needs of each class.

Year 11 – Trilogy Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Homeostasis and response**	• Use working scientifically skills to investigate reaction time. • Comparison skills – nervous and endocrine • Method writing/planning • Making conclusion • Evaluation of contraceptive methods.	• How are conditions in the body controlled? • What can affect reaction times? • How do we prevent pregnancy? • How can infertility be treated? (HT only)	Stimulus, receptor, effector, response, neurone, synapse, reflex arc, insulin, glucagon (HT), FSH, LH, Oestrogen and progesterone, Puberty, menstrual cycle, Contraceptive
	Organic Chemistry	• Use a general formula to determine the molecular formula of different alkanes. • Use a chemical test to identify alkanes from alkenes • Comparison skills • Method writing/planning • Balancing equations.	• How to we obtain useful products from crude oil? • Why is it important to use crude oil in a sustainable way? (Links to Using Resources)	Crude oil, hydrocarbons, fractional distillation, cracking, alkanes, alkenes, combustion
	Inheritance, variation and evolution (into half term 2)	• Comparison skills -mitosis and meiosis, sexual and asexual reproduction. • Evaluation of selective breeding, genetic engineering and natural selection. • Maths skills – using Punnet squares to calculate probability of inheriting conditions/characteristics.	• How do different organisms reproduce? • Why do we look the way we do? • What causes variation? • How can humans use reproduction and DNA to solve problems with food security? • How have organisms changed over time and what evidence do we have to support this?	DNA, gene, genome, allele, homozygous, heterozygous, phenotype, genotype, dominant, recessive, chromosome, meiosis, evolution, natural selection, variation, mutation, genetic engineering, vector, extinction, fossils.
	Waves (into half term 2)	• Use working scientifically skills to investigate wave speed in solids, liquids and reflection/refraction and infra-red radiation. • Method writing/planning • Making conclusion • Comparisons between waves and reflection and refraction.	• What are waves and how can we measure their variables? • How do we use waves to communicate? • How can waves be useful? • How can waves be dangerous?	Transverse and longitudinal, radio waves, microwaves, infrared, visible, ultra violet, x rays, gamma rays, ionising,.

		• Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills – using protractors to measure angle of reflection.		
Half term 2	**Magnetism**	• Use working scientifically skills to investigate permanent and induced magnets and electromagnets. • Method writing/planning • Making conclusion • Maths skills – Using equations to solve problems with the help of HESSU.	• Why do paper clips stick to magnets but drinks cans not? • How could you used a wire and a magnet to generate electricity?	Permanent magnet, induced magnet, attract, repel, solenoid, electromagnet, motor effect, coil, magnetic flux density, split ring commutator, generator, transformer, induction.
	Rates of Reaction	• Use working scientifically skills to investigate how different variables affect rates of reaction. • Maths skills - Calculate rate of reaction from a graph using a tangent (HT only) • Measure the rate of reaction using a variety of scientific methods such as the disappearing cross • Explain Le Chatelier's Principle (HT only)	• How do we measure the rate of a chemical reaction? • How can we speed up chemical reactions? •	Rates, independent, dependent, control, tangents, pressure, temperature, concentration, surface area: volume ratio, catalyst, equilibrium, Le Chatelier's
	Revision	Dependent on needs of each class.	Dependent on needs of each class.	Dependent on needs of each class.
Half term 3 onwards	**Revision**	Dependent on needs of each class.	Dependent on needs of each class.	Dependent on needs of each class.

Year 11 – Triple Science

	Topic	Key Skills	Big Question	Key Terminology
Half term 1	**Homeostasis and response**	• Use working scientifically skills to investigate reaction time and phototropism. • Comparison skills – nervous and endocrine • Method writing/planning • Making conclusion • Evaluation of contraceptive methods.	• How are conditions in the body controlled? • What can affect reaction times? • How do we correct long and short sightedness? • How do we prevent pregnancy? • How can infertility be treated? (HT only) • How does the body control water levels? • What is dialysis? • How do plants respond to a stimulus? •	Stimulus, receptor, effector, response, neurone, synapse, reflex arc, insulin, glucagon (HT), FSH, LH, Oestrogen and progesterone, Puberty, menstrual cycle, Contraceptive, retina, lens, ciliary muscle, hypothalamus, pituitary gland, ADH, kidney, renal, thermoregulation, germination, phototropism, gravitropism.
	Organic Chemistry	• Use a general formula to determine the molecular formula of different alkanes. • Use a chemical test to identify alkanes from alkenes • Comparison skills • Method writing/planning • Balancing equations.	• How to we obtain useful products from crude oil? • Why is it important to use crude oil in a sustainable way? (Links to Using Resources) • How are organic molecules used to make a variety of materials such as polymers, pharmaceuticals, perfumes and flavourings?	Crude oil, hydrocarbons, fractional distillation, cracking, alkanes, alkenes, combustion, alcohols, carboxylic acids, esters, addition polymers, condensation polymers, DNA
	Inheritance, variation and evolution (into half term 2)	• Comparison skills -mitosis and meiosis, sexual and asexual reproduction. • Evaluation of selective breeding, genetic engineering, cloning and natural selection. • Maths skills – using Punnet squares to calculate probability of inheriting conditions/characteristics.	• How do different organisms reproduce? • Why do we look the way we do? • What causes variation? • How can humans use reproduction and DNA to solve problems with food security? • How have organisms changed over time and what evidence do we have to support this?	DNA, gene, genome, allele, homozygous, heterozygous, phenotype, genotype, dominant, recessive, chromosome, meiosis, evolution, natural selection, variation, mutation, genetic engineering, vector, extinction, fossils, cloning, speciation.

	Waves (into half term 2)	• Use working scientifically skills to investigate wave speed in solids, liquids and reflection/refraction and infra-red radiation. • Method writing/planning • Making conclusion • Comparisons between waves and reflection and refraction. • Maths skills – Using equations to solve problems with the help of HESSU. • Maths skills – using protractors to measure angle of reflection.	• What are waves and how can we measure their variables? • How do we use waves to communicate? • How can waves be useful? • How can waves be dangerous?	Transverse and longitudinal, radio waves, microwaves, infrared, visible, ultra violet, x rays, gamma rays, ionising,.
Half term 2	**Space**	• Use working scientifically skills to investigate permanent and induced magnets and electromagnets. • Method writing/planning • Making conclusion • Maths skills – Using equations to solve problems with the help of HESSU.	• What happens during the lifetime of a star? • What happened during the big bang and what evidence do we have? • How was the solar system formed? • How do planets and satellites orbit?	Black body radiation, atmosphere, red shift, big bang, white dwarf, supernova, black hole, gravitational force, orbit, centripetal force.
	Rates of Reaction	• Use working scientifically skills to investigate how different variables affect rates of reaction. • Maths skills - Calculate rate of reaction from a graph using a tangent (HT only) • Measure the rate of reaction using a variety of scientific methods such as the disappearing cross • Explain Le Chatelier's Principle (HT only)	• How do we measure the rate of a chemical reaction? • How can we speed up chemical reactions? •	Rates, independent, dependent, control, tangents, pressure, temperature, concentration, surface area: volume ratio, catalyst, equilibrium, Le Chatelier's
	Revision	Dependent on needs of each class.	Dependent on needs of each class.	Dependent on needs of each class.
Half term 3 onwards	**Revision**	Dependent on needs of each class.	Dependent on needs of each class.	Dependent on needs of each class.