Science (GCSE)

The areas of development are:	Solutions
Biology	
• Paper 1: Cell Biology – Unspecialised plant cells, differentiation, cells structure and microscopes	• 4.1.1/Cell Structure Cell Biology • Seneca Foundation – Cell biology • Seneca Higher – Cell biology • BBC Bitesize – Cell biology
• Paper 1: Cell Biology – Cells, mitosis, stem cells, growth and multicellular organisms	• 4.1.2/Cell Division • Seneca Foundation – Cell division • Seneca Higher – Cell division • BBC Bitesize – Cell division
• Paper 1: Cell Biology - Osmosis, diffusion and active transport, surface to volume ration and gas exchange	• 4.1.3/Transport in Cells – Transport in cells • Seneca Foundation – Transport in cells • Seneca Higher – Transport in cells • BBC Bitesize – Transport in cells
• Paper 1: Organisation – Diet, health, disease, enzymes, blood and the circulatory system	• 4.2.2/Animal tissues, organs and organ systems • Seneca Foundation – Animal tissues, organs and organ systems • Seneca Higher – Animal tissues, organs and organ systems • BBC Bitesize – Animal tissues, organs and organ systems
• Paper 1: Organisation – Transpiration, plant organs, plant structures and plant minerals	• 4.2.3/Plant tissues, organs and systems • Seneca Foundation – Plant tissues, organs and systems • Seneca Higher – Plant tissues, organs and systems • BBC Bitesize – Plant tissues, organs and systems

• Paper 1: Infection and Response – Immunisation, drug trials, viruses, disease prevention, defences, immunity and resistance	• 4.3.1/Communicable disease • Seneca Foundation – Communicable diseases • Seneca Higher – Communicable diseases • BBC Bitesize – Communicable diseases
• Paper 1: Bioenergetics – Photosynthesis, limiting factors, gas exchange and plant growth	• 4.4.1/Photosynthesis • Seneca Foundation - Photosynthesis • Seneca Higher - Photosynthesis • BBC Bitesize - Photosynthesis
• Paper 1: Bioenergetics – Metabolism, respiration both aerobic and anaerobic and energy	• 4.4.2/Respiration • Seneca Foundation - Respiration • Seneca Higher - Respiration • BBC Bitesize – Respiration
• Paper 2: Homeostasis and Response - Homeostasis	• 4.5.1/Homeostasis • Seneca Foundation - Homeostasis • Seneca Higher - Homeostasis • BBC Bitesize - Homeostasis
• Paper 2: Homeostasis and Response – Central nervous system, reflex arc, synapses, reflexes, receptors and effectors	• 4.5.2/The human nervous system • Seneca Foundation – The human nervous system • Seneca Higher – The human nervous system • BBC Bitesize – The human nervous system
• Paper 2: Homeostasis and Response – Type 1 and type 2 diabetes, hormones, controlling fertility and human reproduction	• 4.5.3/Hormonal coordination in humans • Seneca Foundation – Hormonal coordination in humans • Seneca Higher – Hormonal coordination in humans • BBC Bitesize – Hormonal coordination in humans
• Paper 2: Inheritance, Variation and Evolution – Meiosis, genetics, inheritance, foetal screening, sperm and egg and reproduction in plants	• 4.6.1/Reproduction • Seneca Foundation – Reproduction • Seneca Higher - Reproduction • BBC Bitesize - Reproduction
• Paper 2: Inheritance, Variation and Evolution – Genetic engineering, GM, cloning, variation, selective breeding and speciation	• 4.6.2/Variation and evolution • Seneca Foundation – Variation and evolution • Seneca Higher – Variation and evolution

	• BBC Bitesize – Variation and evolution
• Paper 2: Inheritance, Variation and Evolution – Extinction, evolution, bacteria, Darwin and evolution, natural selection and fossil record	• 4.6.3/The development of understanding of genetics and evolution • Seneca Foundation – The development of understanding of genetics and evolution • Seneca Higher – The development of understanding of genetics and evolution • BBC Bitesize – The development of understanding of genetics and evolution
• Paper 2: Inheritance, Variation and Evolution – Five kingdoms and classifications	• 4.6.4/Classification of living organism • Seneca Foundation – Classification of living organism • Seneca Higher – Classification of living organism • BBC Bitesize – Classification of living organism
• Paper 2: Ecology – Competition, adaptations, extreme conditions and ecosystems	• 4.7.1/Adaptations, interdependence and competition • Seneca Foundation – Adaptations, interdependence and competition • Seneca Higher – Adaptations, interdependence and competition • BBC Bitesize – Adaptations, interdependence and competition
• Paper 2: Ecology – Carbon cycle, fieldwork, water cycle, food chains and webs	• 4.7.2/Organisation of an ecosystem • Seneca Foundation – Organisation of an ecosystem • Seneca Higher – Organisation of an ecosystem • BBC Bitesize – Organisation of an ecosystem
• Paper 2: Ecology – Population change, biodiversity, human waste, deforestation and peat removal, global pollution and greenhouse effect	• 4.7.3/Biodiversity and the effect of human interaction on ecosystems • Seneca Foundation – Biodiversity and the effect of human interaction on ecosystems • Seneca Higher – Biodiversity and the effect of human interaction on ecosystems • BBC Bitesize – Biodiversity and the effect of human interaction on ecosystems
Chemistry	

• Paper 1: Atomic structure and the periodic table – elements, structure of the atom, subatomic particles, RAM, reactions, elements and compounds	• 5.1.1/A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes • Seneca foundation – A simple model of the atom, symbols, relative atomic mass, electronic mass, electronic charge and isotopes • Seneca higher – A simple model of the atom, symbols, relative atomic mass, electronic mass, electronic charge and isotopes • BBC Bitesize – A simple model of the atom, symbols, relative atomic mass, electronic mass, electronic charge and isotopes
• Paper 1: Atomic structure and the periodic table – Group 1, Group 7, Noble Gases and Periodic table	• 5.1.2/The periodic table • Seneca Foundation – The periodic table • Seneca Higher – The periodic table • BBC Bitesize – The periodic table
• Paper 1: Bonding, structure and the properties of matter – Ionic bonding, covalent bonding, metallic bonding, simple and giant structures	• 5.2.1/Chemical bonds, ionic, covalent and metallic • Seneca Foundation – Chemical bonds, ionic, covalent and metallic • Seneca Higher – Chemical bonds, ionic, covalent and metallic • BBC Bitesize – Chemical bonds, ionic, covalent and metallic
• Paper 1: Bonding, structure, and the properties of matter – States of matter and properties of metals	• 5.2.2/How bonding and structure are related to the properties of substances • Seneca Foundation – How bonding and structure are related to the properties of substances • Seneca Higher – How bonding and structure are related to the properties of substances • BBC Bitesize – How bonding and structure are related to the properties of substances
• Paper 1: Bonding, structure, and the properties of matter – Allotropes of carbon	• 5.2.3/Structure and bonding of carbon • Seneca Foundation – Structure and bonding of carbon • Seneca Higher – Structure and bonding of carbon • BBC Bitesize – Structure and bonding of carbon
• Paper 1: Quantitative chemistry – Atoms and formula, RFM, % mass, uncertainty and mass change	• 5.3.1/Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations

	• Seneca Foundation – Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations • Seneca Higher – Chemical measurements, conservation of mass and the wuantitative interpretation of chemical equations
• Paper 1: Quantitative chemistry – Reactions, empirical formula, moles, concentration and reacting masses	• 5.3.2/Use of amount of substance in relation to messes of pure substances • Seneca Foundation – Use of the amount of substance in relation to masses of pure substances • Seneca Higher – Use of amount of substance in relation to masses of pure substances • BBC Bitesize – Use of amount of substance in relation to masses of pure substances
• Paper 1: Chemical changes – Metals and ores, transition metals, displacement, REDOX and Oxides	• 5.4.1/Reactivity of metals • Seneca Foundation – Reactivity of metals • Seneca Higher – Reactivity of metals • BBC Bitesize – Reactivity of metals
• Paper 1: Chemical changes – Salts, acids and bases, alkalis, neutralisation, strong and weak acids, acid and metal reactions	• 5.4.2/Reactions of acids • Seneca Foundation 1 – Reactions of acids • Seneca Foundation 2 – Reactions of acids • Seneca Higher 1 – Reactions of acids • Seneca Higher 2 – Reactions of acids • BBC Bitesize – Reactions of acids
• Paper 1: Chemical changes – Electrolysis, electrodes and the uses of electrolysis	• 5.4.3/Electrolysis • Seneca Foundation - Electrolysis • Seneca Higher - Electrolysis • BBC Bitesize - Electrolysis
• Paper 1: Energy changes – Exo and endothermic reactions, bond breaking and making, measuring energy changes and calculating bond energies	• 5.5.1/Exothermic and endothermic reactions • Seneca Foundation – Exothermic and endothermic reactions • Seneca Higher – Exothermic and endothermic reactions

	• BBC Bitesize – Exothermic and endothermic reactions
• Paper 2: The rate and extent of chemical change – Reaction rate and collision theory, factors affecting rate, catalysts, rate of reaction graphs and measuring rate	• 5.6.1/Rate of reaction • Seneca Foundation – Rate of reaction • Seneca Higher – Rate of reaction • BBC Bitesize – Rate of reaction
• Paper 2: The rate and extent of chemical change – Reversible reactions and choosing reaction conditions	• 5.6.2/Reversible reactions and dynamic equilibrium • Seneca Foundation – Reversible reactions and dynamic equilibrium • Seneca Higher – Reversible reactions and dynamic equilibrium • BBC Bitesize – Reversible reactions and dynamic equilibrium
• Paper 2: Organic chemistry – Crude oil, alkanes, fuels and combustion	• 5.7.1/Carbon compounds as fuels and feedstock • Seneca Foundation – Carbon compounds as fuels and feedstock • Seneca Higher – Carbon compounds as fuels and feedstock • BBC Bitesize – Carbon compounds as fuels and feedstock
• Paper 2: Chemical analysis – Chromatography, formulations and pure substances	• 5.8.1/Purity, formulations and chromatography • Seneca Foundation – Purity, formulations and chromatography • Seneca Higher – Purity, formulations and chromatography • BBC Bitesize – Purity, formulations and chromatography
• Paper 2: Chemical analysis – Identification of common gases	• 5.8.2/Identification of common gases • Seneca Foundation – Identification of common gases • Seneca Higher – Identification of common gases • BBC Bitesize – Identification of common gases
• Paper 2: Chemistry of the atmosphere – Atmosphere past and present	• 5.9.1/The composition and evolution of the Earth's atmosphere • Seneca Foundation – The composition and evolution of the Earth's atmosphere • Seneca Higher – The composition and evolution of the Earth's atmosphere • BBC Bitesize – The composition and evolution of the Earth's atmosphere
• •Paper 2: Chemistry of the atmosphere – Climate changes and the processes that change the atmosphere	• 5.9.2/Carbon dioxide and methane as greenhouse gases

	• Seneca Foundation - Carbon dioxide and methane as greenhouse gases • Seneca Higher – Carbon dioxide and methane as greenhouse gases • BBC Bitesize – Carbon dioxide and methane as greenhouse gases
• Paper 2: Chemistry of the atmosphere – impact of burning hydrocarbons and pollution	• 5.9.3/Common atmospheric pollutants and their sources • Seneca Foundation – Common atmospheric pollutants and their sources • Seneca Higher – Common atmospheric pollutants and their sources • BBC Bitesize – Common atmospheric pollutants and their sources
• Paper 2: Using resources – Purifying water and testing for water	• 5.10.1/Using the Earth's resources and obtaining portable water • Seneca Foundation – Using the Earth's resources and obtaining potable water • Seneca Higher – Using the Earth's resources and obtaining potable water • BBC Bitesize – Using the Earth's resources and obtaining potable water
• Paper 2: Using resources – Reducing pollution and recycling metals	• 5.10.2/Life cycle assessment and recycling • Seneca Foundation – Life cycle assessment and recycling • Seneca Higher – Life cycle assessment and recycling • BBC Bitesize – Life cycle assessment and recycling
Physics	
• Paper 1: Energy – Energy changes in a system and the ways energy is stored before and after such changes – EPE, GPE, Power, what is energy, conservation, efficiency and insulation	• 6.1.1/Energy changes in a system, and the ways energy is stored before and after such changes • Seneca Foundation – Energy changes in a system, and the ways energy is stored before and after such changes • Seneca Higher – Energy changes in a system, and the ways energy is stored before and after such changes • BBC Bitesize – Energy changes in a system, and the ways energy is stored before and after such changes
• Paper 1: Energy – Conservation and dissipation of energy including Conservation of Energy, Efficiency and Insulation	• 6.1.2/Conservation and dissipation of energy

	• Seneca Foundation – Conservation and dissipation of energy • Seneca Higher – Conservation and dissipation of energy • BBC Bitesize – Conservation and dissipation of energy
• Paper 1: Electricity – Current, potential difference and resistance including Ohm's law, IV graphs, circuit symbols, resistors and LDR's	• 6.2.1/Current, potential difference and resistance • Seneca Foundation – Current, potential difference and resistance • Seneca Higher – Current, potential difference and resistance • BBC Bitesize – Current, potential difference and resistance
• Paper 1: Electricity – Series and parallel circuits including resistor combinations series and parallel circuits	• 6.2.2/Series and parallel circuits • Seneca Foundation – Series and parallel curcuits • Seneca Higher – Series and parallel circuits • BBC Bitesize – Series and parallel circuits
• Paper 1: Electricity – Domestic uses and safety including ac/dc, batteries/cells, insulation, fuses, plugs and RCD's	• 6.2.3/Domestic uses and safety • Seneca Foundation – Domestic uses and safety • Seneca Higher – Domestic uses and safety • BBC Bitesize – Domestic uses and safety
• Paper 1: Electricity – Energy transfers including transformers, national grid, electrical power and energy transfers in the home	• 6.2.4/Energy transfers • Seneca Foundation – Energy transfers • Seneca Higher – Energy transfers • BBC Bitesize – Energy transfers
• Paper1: Particle model of matter – Changes of state and the particle model including density, changes of state and states of matter	• 6.3.1/Changes of state and the particle model • Seneca Foundation – Changes of state and the particle model • Seneca Higher – Changes of state and the particle model • BBC Bitesize – Changes of state and the particle model
• Paper 1: Particle model of matter- Internal energy and energy transfers including heat and temperature, SHC and latent heat	• 6.3.2/Internal energy and energy transfers • Seneca Foundation – Internal energy and energy transfers • Seneca Higher – Internal energy and energy transfers • BBC Bitesize – Internal energy and energy transfers
• Paper 1: Particle model of matter – Particle model and pressure including Kinetic Theory	• 6.3.3/Particle model and pressure • Seneca Foundation – Particle model and pressure • Seneca Higher – Particle model and pressure

	• BBC Bitesize – Particle model and pressure
• Paper 1: Atomic Structure – Atoms and isotopes including history, isotopes and the PT, protons, neutrons and the atom	• 6.4.1/Atoms and isotopes • Seneca Foundation – Atoms and isotopes • Seneca Higher – Atoms and isotopes • BBC Bitesize – Atoms and isotopes
• Paper 1: Atomic Structure – Atoms and nuclear radiation including Alpha, Beta, Gamma, the dangers of radioactivity, half-life, ionising and detecting, decay and transmutation and nuclear reactions	• 6.4.2/Atoms and nuclear radiation • Seneca Foundation – Atoms and nuclear radiation • Seneca Higher – Atoms and nuclear radiation • BBC Bitesize – Atoms and nuclear radiation
• Paper 2: Forces – Resultant forces, vectors and scalars	• 6.5.1/Forces and their interactions • Seneca Foundation – Forces and their interactions • Seneca Higher – Forces and their interactions • BBC Bitesize 1 • BBC Bitesize 2 • BBC Bitesize 3
• Paper 2: Forces – Work done 1 and work done	• 6.5.2/Work done and energy transfer • Seneca Foundation – Work done and energy transfer • Seneca Higher – Work done and energy transfer • BBC Bitesize – Work done and energy transfer
• Paper 2: Forces – Elastic potential energy and Hooke's Law	• 6.5.3/Forces and elasticity • Seneca Foundation – Forces and elasticity • Seneca Higher – Forces and elasticity • BBC Bitesize – Forces and elasticity
• Paper 2: Forces- Acceleration, distance time graphs, Newton's Laws, speed and stopping distances	• 6.5.6/Forces and motion • Seneca Foundation – Forces and motion • Seneca Higher – Forces and motion • BBC Bitesize 1 • BBC Bitesize 2
• Paper 2: Forces – Momentum and collisions	• 6.5.5/Momentum • Seneca Higher - Momentum

	• BBC Bitesize - Momentum
• Paper 2: Waves -Wavelength, the wave equation and types of waves	• 6.6.1/Waves in air, fluids and solids • Seneca Foundation – Waves in air, fluids and solids • Seneca Higher – Waves in air, fluids and solids • BBC Bitesize 1 • BBC Bitesize 2 • BBC Bitesize 3 • BBC Bitesize 4
• Paper 2: Waves – Wireless signals, the EMS, refraction, frequency and wavelength	• 6.6.2/Electromagnetic waves • Seneca Foundation – Electromagnetic waves • Seneca Higher – Electromagnetic waves • BBC Bitesize – Electromagnetic waves
• Paper 2: Magnetism and electromagnetism – magnetic fields	• 6.7.1/Permanent and induced magnetism, magnetic forces and fields • Seneca Foundation – Permanent and induced magnetism, magnetic forces and fields • Seneca Higher – Permanent and induced magnetism, magnetic forces and fields • BBC Bitesize – Permanent and induced magnetism, magnetic forces and fields
• Paper 2: Magnetism and electromagnetism – Electromagnets, left hand and right hand rule	• 6.7.2/The motor effect • Seneca Foundation – The motor effect • Seneca Higher – The motor effect • BBC Bitesize – The motor effect
• Presenting observations and other data using appropriate methods	• Undertake the exercises on the AQA Making Sense of Graphical Data and Describing Patterns documents
• Carrying out and representing mathematical and statistical analysis	• Undertaking the exercises on the AQA Describing Patterns document
• Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including	• Undertake the exercises on the AQA The Earl of Abergavenny and Organising a mind map documents

identifying patterns and trends, making inferences and drawing conclusions	
• Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error	• Undertake the exercises on the AQA Describing Patterns document
• Identifying trends on a graph and producing a conclusion	• Undertake the exercises on the AQA Describing Patterns document
• Plotting data and drawing a line of best fit	• Undertake the exercises on the AQA Making Sense of Graphical Data document
• Making conclusions from table data	• Undertake the exercises on the AQA Making Sense of Graphical Data and Pineapple Jelly documents
• Evaluating information from a table and linking it to your own knowledge	• Undertake the exercises on the AQA Pineapple documents

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