Ifield Community College
Science Department

Head of Department: AHE
Head of Subjects: CBO, HSU, MHA
Teachers: CPI, DBI, DWH, JLO, SJI, SSA, SRM, TAT

Year 10 Curriculum Overview
Subjects and qualifications: GCSE Combined Science

GCSE Combined Science:

The Big Idea Principle.

Our KS4 Science curriculum at ICC builds on our KS3 approach, using AQA's big ideas principle so that the generalisations, principles and models which connect Scientific concepts are at the heart of student learning. We believe this is how students learn to see the world analytically, to explain phenomena and make predictions – all skills they need for their next stage of scientific learning. Content across KS4 is colour coded and mapped against the big idea principles from our key stage 3 curriculum so that students can clearly recognise the progression in their learning and as a result are more confident in applying the transferable skills that they have developed in their prior learning to new and unfamiliar ideas in their GCSE studies.

The Big Idea's studied in Biology lessons: Organisms and Genes

The Big Idea's studied in Chemistry lessons: Reactions

The Big Idea's studied in Physics lessons: Forces, Electromagnets and Waves

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Biology		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	**Unit(s):**	**Infection and response**	**Infection and response** and **Homeostasis and response**	**Homeostasis and response**	**Homeostasis and response**	**Inheritance, variation and evolution**	**Inheritance, variation and evolution** and Application of skills & knowledge
	Key Skills:	**HSW**: Analyse data from graphs and tables, using models **Maths:** Interpreting graphs, analysing correlation, making estimations, using standard units and converting, orders of magnitude **Literacy:** Defining keywords, discussion, oracy, long answer questions, comprehension, organising information	**HSW**: Collecting data, converting data using a table, using apparatus, applying practical to real life situations **Maths:** Analysing correlation, graphs and tables, making estimations, drawing graphs **Literacy:** Discussion, debate, oracy, long answer questions, comprehension, labeling diagrams, defining keywords, using articles	**HSW**: Interpreting data from graphs and tables, discussing limitations, using models **Maths:** Decimals, interpreting line graphs, making estimations, drawing graphs **Literacy:** Labelling diagrams, discussion, debate, oracy, long answer questions, organising information	**HSW**: Interpreting data, using models, applying information to real life situations **Maths:** Decimals, interpreting bar graphs and tables **Literacy:** Discussion, debate, oracy, long answer questions, organising information, using articles	**HSW**: Discuss limitations, using Punnett squares **Maths:** Using percentages, probability, and ratios to predict inheritance of traits **Literacy:** Comprehension, defining keywords, discussion, comparison, long answer questions	**HSW**: Discuss limitations, using Punnett squares **Maths:** Using percentages, probability, ratios to predict inheritance of traits **Literacy:** Comprehension, defining keywords, discussion, long answer questions

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	Assessment:	**Extended Response**: **1. Explaining** how white blood cells protect us **Practical:** N/A **Homework:** **Infection and response** MCQ, **Cell Biology** retrieval questions	**Extended Response**: **1. Describe** the process to test new drugs **2. Describe** the blink reflex and **explain** why we have this **End of unit test:** **Infection and response** **Practical:** **RP6 Reaction time:** Plan and carry out an investigation into the effect of a factor on human reaction time. **Homework:** **Infection and response** Seneca, **Organisation** retrieval questions	**Extended Response**: N/A **Cumulative assessment:** **Cell Biology** **Bioenergetics** **Organisation** **Infection and Response** **Practical:** N/A **Homework:** **Homeostasis and response** MCQ, **Bioenergetics** retrieval questions	**Extended Response**: **1. Evaluate** the use of contraceptive methods **End of unit test:** **Homeostasis and response** **Practical:** N/A **Homework:** **Homeostasis and response** Seneca, **Infection and response** retrieval questions	**Extended Response**: N/A **Cumulative assessment:** **Cell Biology** **Bioenergetics** **Organisation** **Infection and Response** **Homeostasis and response** **Inheritance** **Practical:** N/A **Homework:** **Inheritance** MCQ, **Cell Biology** retrieval questions	**Extended Response**: **1. Complete** the genetic diagram **Exam week:** Paper 1 content: **Cell Biology** **Bioenergetics** **Organisation** **Infection and Response** **Practical:** N/A **Homework:** **Inheritance** Seneca, **Organisation** retrieval questions
	Retrieval:	Bacterial cells, organ systems, respiratory system, blood and circulation	Effects of drugs on the body, Organ systems, animal cells, specialised cells	Organ systems, blood and circulation, transport in cells	Aerobic and anaerobic respiration, digestion, enzymes	Mitosis and cell division, stem cells, specialised cells, organelles	Meiosis and mitosis, microscopes, photosynthesis, transport in cells, communicable diseases

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Chemistry		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	**Unit(s):**	Chemical Changes	Chemical and Changes Quantitative chemistry 2	Rates of reaction	Rates of reaction	Rates of reaction and Organic Chemistry	Chemical analysis
	Key Skills:	**HSW:** Chemical reactions practical's, electrolysis, making salts **Maths:** pH scales and orders of magnitude, concentrations, equations **Literacy:** Writing chemical equations, deducing products	**HSW:** Maths skills, scientific definitions, concentrations and moles in everyday language **Maths:** Chemical equations, balancing equations, ratios, substituting values, percentages, rearranging equations, standard form, decimals, units **Literacy:** Scientific vocabulary and definitions	**HSW:** Rates of reaction experiments, using models and analogies **Maths:** Estimates, graphs, gradients, fractions, writing equations **Literacy:** Using information in everyday contexts	**HSW:** Rates of reaction experiments, using models and analogies **Maths:** Estimates, graphs, gradients, fractions, writing equations **Literacy:** Using information in everyday contexts	**HSW:** Using models, making drawings, investigating properties **Maths:** 3D forms, balancing equations **Literacy:** Long answer questions	**HSW:** Chromatography experiment, planning experiments, gas testing **Maths:** Using melting points, graphs, percentages, fractions, significant figures **Literacy:** Using scientific vocabulary

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	Assessment:	**Extended Response:** 1. **Describe** how to make pure crystals **End of unit test:** Chemical Changes **Practical:** RQP 8 soluble salts: Preparation of a pure, dry sample of a soluble salt from an insoluble oxide **Homework:** Chemical changes Seneca and MCQ / Quantitative chemistry 1 and Energy changes retrieval questions	**Extended Response:** 1. **Balancing equations** and **calculating** mass. **Practical:** RQP 9 soluble salts: Investigate what happens when aqueous solutions are electrolysed. **Homework:** Quantitative chemistry 2 MCQ and Seneca / Chemical changes retrieval questions	**Extended Response:** 1. **Describe** how to carry out fair investigations on rate of reaction **End of unit test:** Quantitative chemistry (part 1 and 2) **Practical:** RQP 11 rates of reaction: investigate how changes in concentration affect the rates of Reactions. **Homework:** Rates of reaction MCQ, Quantitative chemistry 2 retrieval questions	**Extended Response:** N/A **End of unit test:** Rates of reaction **Practical:** N/A **Homework:** Rates of reaction Seneca and retrieval questions	**Extended Response:** 1. Use diagrams to **describe** and **explain** how hydrocarbons are separated **Practical:** N/A **Cumulative assessment:** The rate and extent of chemical change, Organic chemistry and Chemistry of the atmosphere **Homework:** Organic Chemistry MCQ and Seneca / The properties of matter retrieval questions	**Extended Response:** N/A **End of unit test:** Chemical analysis **Practical:** RQP 12 Chromatography: Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values. **Homework:** Chemical analysis MCQ and Seneca, Rates of reaction and Chemical analysis retrieval questions
	Retrieval:	Metals and non-metals, pH, periodic table, bonding, chemical equations, reactions, experimental procedure	Bonding, chemical equations, atomic structure, Mr, conservation of mass	Maths skills incl. graphs and tables, energy changes	Chemical reactions and equations	Mixtures and separation, bonding in non-metals, writing equations, properties	Element, compounds and mixtures, states of matter

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Physics		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	**Unit(s):**	Atomic Structure	Forces	Forces	Forces **and** Waves	Waves	Waves
	Key Skills:	**HSW:** Development of scientific thinking; Experimental skills and strategies; Analysis and evaluation; Scientific vocabulary, quantities, units, symbols, and nomenclature **Maths:** Arithmetic and numerical computation; Handling data; Algebra; Graphs; Geometry and trigonometry **Literacy:** Understanding key vocabulary; Oracy via discussion	**HSW:** Development of scientific thinking; Experimental skills and strategies; Analysis and evaluation; Scientific vocabulary, quantities, units, symbols, and nomenclature **Maths:** Arithmetic and numerical computation; Handling data; Algebra; Graphs; Geometry and trigonometry **Literacy:** Written equations Written communication	**HSW:** Development of scientific thinking; Experimental skills and strategies; Analysis and evaluation **Maths:** Arithmetic and numerical computation; Algebra; Geometry and trigonometry **Literacy:** Understanding key vocabulary; Dialogic lesson	**HSW:** Development of scientific thinking; Experimental skills and strategies and Analysis and evaluation **Maths:** Arithmetic and numerical computation; Algebra, Geometry and trigonometry **Literacy:** Understanding key vocabulary; SECC	**HSW:** Development of scientific thinking; Experimental skills and strategies **Maths:** Arithmetic and numerical computation; Algebra **Literacy:** Written equations; Comprehension	**HSW**: Development of scientific thinking; Analysis and evaluation; Scientific vocabulary; quantities, units, symbols, and nomenclature **Maths:** Arithmetic and numerical computation; Handling data; Algebra; Graphs **Literacy:** Understanding key vocabulary; Written equations; Evaluating; Sequencing information

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	Assessment:	**Extended Response:** 1. **Describe** current model of atom 2. **Compare** alpha, beta and gamma radiation **End of unit test:** **Atomic Structure** **Homework**: **Atomic Structure** Seneca / **Energy**, **Electricity**, **Particle Model** MCQ	**Extended Response:** 1. **Explaining** terminal velocity **Practical:** **RQP 18 Acceleration:** Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force **Homework**: **Forces** Seneca / **Energy**, **Electricity**, **Particle Model**, **Atomic Structure** MCQ	**Extended Response:** 1. **Explaining** factors affecting stopping and breaking distance **Practical:** **RQP 19 Forces and extension:** Investigate the relationship between force and extension for a spring. **Homework**: **Energy**, **Electricity**, **Particle Model**, **Atomic Structure** and **Forces** MCQ	**Extended Response:** 1. **Compare** different types of waves **End of unit test:** **Forces** **Practical:** **RQP 20 Waves:** Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. **Homework**: **Waves** Seneca / **Energy**, **Electricity**, **Particle Model**, **Atomic Structure**, **Forces** MCQ	**Extended Response:** 1. **Describe** how to measure properties of a water wave **Cumulative assessment:** **Forces** **Waves** **Practical:** **RQP 21 Radiation and absorption:** Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface. **Homework**: **Energy**, **Electricity**, **Particle Model**, **Atomic Structure**, **Forces**, **Waves** and **Magnetism and electromagnetism** MCQ	**Extended Response:** 1. N/A **End of unit test:** **Waves** **Practical:** N/A **Homework**: **Energy**, **Electricity**, **Particle Model**, **Atomic Structure**, **Forces**, **Waves** and **Magnetism and electromagnetism** MCQ
	Retrieval:	Energy, Electricity, Particle Model and Atomic	Energy, Electricity, Particle Model and Atomic	Energy, Electricity, Particle Model, Atomic and Forces	Energy, Electricity, Particle Model, Atomic and Forces	Energy, Electricity, Particle Model, Atomic, Forces and Waves	Energy, Electricity, Particle Model, Atomic, Forces and Waves