Science Curriculum Map

Year 10						
Learning Period	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Discipline	**Biology**	**Biology**	**Physics**	**Physics and Chemistry**	**Chemistry**	**Physics and Chemistry**
Topic	Human Biology	Plant Biology	Nuclear & Thermal Physics	Electricity Chemical Fundamentals	Reacting Substances	Astrophysics Humans & The Earth
Our Big Questions in Science	1. What are living things made of? 2. What keeps organisms healthy?	1. Why do organisms depend on each other and their environment? 2. What are living things made of? 3. What keeps plants healthy? 4. How do plants grow?	1. What is matter? 2. How does energy spread?	1. What is electricity? 2. How is energy transferred? 3. What are substances? 4. What is chemical change?	1. What are substances? 2. What is chemical change?	1. Where are we in Space? 2. How does chemistry affect the earth? 3. What is the earth made of and how is it changing?
Substantive knowledge	- How animal, plant, and bacterial cells release energy for life processes. - Respiration without oxygen in animals and plants/yeast. - Anatomy and physiology of human organs including those in the digestive, circulatory, and respiratory systems. - The role of specific enzymes in digestion - How cells, tissues, organs, and organ systems are adapted for their function. - The mechanical process of breathing - The process of diffusion and its links to gas exchange. - The composition of the blood and the structural adaptations of blood vessels. - The impact of coronary heart disease (CHD), and other non-communicable diseases, on health. - The function of enzymes and how conditions affect their function. - That difference reagents are used to test food products for presence of food groups. - Metabolism and examples of reactions that both build and break down molecules. - Bacteria reproduce rapidly by binary fission. Bacteria can be grown in a nutrient broth or on an agar plate . - Disinfectants and antibiotics are tested using uncontaminated cultures of microorganisms. - Monoclonal antibodies are proteins produced from a single clone of cells used to treat cancer, and used to measure particular chemical or pathogens.	- The interaction between organisms, and the environment. - Energy transfers between organisms within an ecosystem. - The relationship between predator and prey in a stable community. - Techniques used to sample the distribution and abundance of species within an ecosystem. - Environmental change can affect the distribution of species. - Biomass is transferred through food webs - The structure of a plant and how it is adapted to carry out specific functions. - How plants make their own food through photosynthesis - The processes that move water, mineral ions and glucose through a plant. - Abiotic and biotic factors that affect a plants ability to photosynthesise. - Plants are infected by disease, direct content, water or air by viral, bacterial or fungal pathogens and insects. - How carbon and water is cycled through the environment. - Temperature, water and oxygen affects the decay of biological material. - Biogas is generated by anaerobic decay of biological material. - A growing population requires modern farming methods to meet food demand. -	- That energy can be transferred by waves without the presence of particles. - The features of the electromagnetic spectrum. - The properties and uses of waves that constitute the electromagnetic spectrum. - T hat different surfaces emit different levels of IR radiation - Waves can be transmitted or absorbed at the boundary between two different materials. - How light is reflected at the boundary of mediums. - How light is refracted through different mediums - Lenses form an image by refracting light. Images formed by convex lenses are either real or virtual. Images formed by concave lenses are always virtual. - Colour filters work by absorbing certain wavelengths and transmitting other wavelengths. - The structure of the current model of an atom and how the theories relating to the model of the atom have developed over time. - Types of radioactive decay and their properties. - Background radiation is around us all the time and originates from natural sources and man-made sources. - Writing equations that illustrate radioactive decay - The difference between irradiation and contamination. - Nuclei fission is the splitting of large and unstable nuclei. - Nuclei fusion is the joining of two light nuclei to form a heavier nucleus. - Using the particle model to understand density, changes of state and pressure. - Energy changes during changes of state, heating, and cooling. - The role of temperature and volume in gas pressure - Pressure in a fluid causes a formal force to any surface. - Effect of pressure changes both in the atmosphere and at depth.	- Knowledge of appropriate symbols to illustrate circuit components. - Understanding of current, charge, potential difference, and resistance in relation to electricity. - The rule for current in series and parallel circuits. - The rule for potential difference in series and parallel circuits. - Ohms law and the components that it is applicable to. - The rule for resistance in series and parallel circuits. - The IV characteristics of different components. - Difference between alternating and direct current. - How electricity is transported across the national grid efficiently and how it safely enters our homes. - The components within a plug and how this allows for their safe operation. - That the total energy transferred to an appliance depends on how long the appliance is on for and its power. - Certain insulating material can become electrically charged and may exert a force on each other. - A charge object creates an electric field surrounding itself. - The construction and use of electromagnets. - The structure of metals and nonmetals and their associated properties. - Transition metals have similar properties to each other, and different properties to group 1 metals. - The structure and function of alloys - Structures less than 100 nm are nanoparticles. There properties depend on their high surface area to volume ratio. - Nanoparticles have a range of application in medicine, electronic, cosmetics and catalyst. - Corrosion is the destruction of materials by a chemical reaction - That elements can be placed into a reactivity series and knowledge of	- The difference between exothermic and endothermic reactions and how this can be illustrated with a reaction profile diagram. - That bond breaking and bond forming occur in all reactions. - Cells contain chemicals which react to produce electricity. - Simple cells are made with two different metals and an electrolyte. - Batteries are non-rechargeable or rechargeable. - Fuel cells used an external source of fuel. The fuel is oxidised electrochemically to produce a potential difference. - Methods to measure the rate of a reaction - Factors that determine the rate at which reactions progress. - The mole as a measure of concentration and using this value to determine the limiting reactants in a chemical reaction. - How catalysts increase the rate of a reaction. - Certain reactions are reversible and will reach a point of equilibrium. - Knowledge of Le Chatelier's principles. - Writing word equations to illustrate the reactants and products - The law of conservation of mass and the relationship with balanced equations. - Determining the relative formula mass of a compound. - Calculating the mass produced in a reaction from knowledge of reactants and vice versa. - That concentration is a measure of the mass of a substance in a certain volume of a solution. - Concentrations and volumes of two solutions can be used to calculate an unknown concentration or volume. - Titrations can be used to determine the volume of acid/alkali to neutralise a solution. - Evaluate the amount of useful product produced in a reaction from a known amount of starting material.	- Universe formed during the Big Bang. - Evidence for the Big Bang, including the observed increase in wavelength of light from the most distance galaxies. - Stars experience a life cycle depending on their size. - Fusion processes in start produced all naturally occurring elements. Elements heavier than iron are produced in supernova. - Describe the of the solar system, including our Star the Sun, eight planets and natural satellites. - Gravity provides the force that allow planets and satellites to maintain circular orbits. - The composition of earth's atmosphere compared to its early atmosphere. - How the earth's atmosphere has changed over time. - The greenhouse effect and its association with global warming. - Methods of reducing our carbon footprint. - Utilisation of global resources by humans and their impact on the environment. - The harmful effects of combustion. - Reusing, reducing and recycling resources helps to prevent finite natural resources running out. - Generating potable water from both fresh and saline water sources. - Treatment of waste water and sewage. - The process of phytomining and bioleaching as an extraction method. - The impact of resources can be assessed using a life cycle assessment. - The properties of polymers depend on the monomers they are made from. - Ammonia is produced in the Haber Process, used to produced nitrogen-based fertilisers. - The Haber process is a trade-off between rate of production and position of equilibrium.

Science Curriculum Map

				this is used to displace other elements from their compounds. - Writing ionic half equations for displacement reactions. - The electrolysis of molten and aqueous compounds. - Chemical reactions are used to extract metals from ores. -	-	
Disciplinary Knowledge	- Use good scientific vocabulary to clearly articulate scientific concepts. - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Use scientific theory and explanations to develop an accurate hypothesis. - Identify during experimental procedure the variables that are being changed, measured, and kept constant. - Carry out experiments with due regard for the correct use of apparatus and the health and safety considerations associated with this. - Plan an experiment to make observations and be able to characterise a substance. - Apply knowledge of suitable apparatus and material use to carry out - Manipulating mathematical equations to analyse results - Able to express answers in standard form (HT) - Evaluate risk in practical science and the wider societal impact - Appreciate the limitations of science and ethical issues that may arise.	- Use good scientific vocabulary to clearly articulate scientific concepts. - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Recognise when to apply a knowledge of sampling techniques to ensure that samples collected are representative. - Describe a practical procedure that uses observations to lead to a valid outcome. - Evaluate methods used to obtain data and make suggestions for their improvement in further investigations. - Recognise and explain everyday technological applications of science - Appreciate the limitations of science and ethical issues that may arise.	- Use good scientific vocabulary to clearly articulate scientific concepts. - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Understand how scientific theory changes and develop over time. - Explain how experimental data can lead to changes in models or theories. - Evaluate whether data supports or limits scientific theory. - Recognise the importance of peer-review of results and communicating results to a range of audiences. - Using models to illustrate scientific concepts - Interpreting graphs. - Use prefixes and powers of 10 for orders of magnitude.	- Use good scientific vocabulary to clearly articulate scientific concepts - Carry out and represent mathematical and statistical analysis. - Recognise the importance of scientific quantities and understand how they are determined. - Use appropriate units during mathematical calculations. - Understand the meaning of prefixes in scientific units and utilise this knowledge to confidently convert between units in a variety of scientific contexts. - Present calculated values to an appropriate number of significant figures. - Use prefixes and powers of 10 for orders of magnitude. - Use electrical equipment to test scientific hypotheses. - Evaluate risk in practical science applications and recognise and explain science in everyday life. - Appreciate the power and limitations of science and consider any ethical applications that may arise.	- Use good scientific vocabulary to clearly articulate scientific concepts - Apply a knowledge of a range of techniques and instruments that can be used to gather data and use these to make observable measurements. - Evaluate data in terms of its accuracy, precision, repeatability, and reproducibility. - Identify in experimental method potential sources of random and systematic error. - Drawing graphs - Carry out and represent mathematical and statistical analysis. - Use appropriate units during mathematical calculations. - Understand the meaning of prefixes in scientific units and utilise this knowledge to confidently convert between units in a variety of scientific contexts. - Present calculated values to an appropriate number of significant figures.	- Use good scientific vocabulary to clearly articulate scientific concepts. - Understand how scientific theory changes and develop over time. - Explain how science is applied to the context of everyday life and evaluate the personal, social, economic, and environmental impact of this. - Describe the impact of humans on the environment and evaluate methods used to counteract this effect. - Recognise the important of scientific results being peer reviewed and understand the impact of non-peer reviewed science on the target audience. - Interpret and analyse trends in data and use this to draw conclusions. - Recognise and explain everyday technological applications of science
Lesson Sequence	1. Animal and plant cells (Recap) 2. Aerobic respiration 3. Anaerobic respiration 4. The lungs & Ventilation 5. Diffusion 6. Gas Exchange 7. Diffusion & Surface Area 8. Diffusion in Action 9. Fermentation 10. Parts of the Brain (SS) 11. Brain surgery (SS) 12. The Heart 13. Blood Flow & Heart Rate 14. Blood Composition 15. Coronary Heart Disease (CHD) 16. Non Communicable Diseases 17. Disease Data 1 18. The Digestive System 19. Enzymes 20. Optimum Conditions for Enzymes 21. RP – Testing for Food Groups (1) 22. RP – Testing for Food Groups (2) 23. RP – pH & Enzymes (1) 24. RP – pH & Enzymes (2)	1. Food webs 2. Ecosystems 3. Predator Prey 4. Sampling techniques 5. RP – Quadrats 6. Distribution of species (SS) 7. Pyramids of biomass and tropic levels (SS) 8. Decomposers (SS) 9. Plant Cells, Tissues, and Organs 10. Structure of a Leaf 11. Osmosis 12. Osmosis in Action 13. RP – Osmosis (1) 14. RP – Osmosis (2) 15. Active Transport 16. Transpiration 17. Transpiration Experiments 18. Translocation 19. Photosynthesis 20. Limiting Factors (HT) 21. Inverse square law (HT) 22. RP – Factors Affecting Photosynthesis (1)	1. Types of Electromagnetic Waves 2. Properties & Uses of EM waves 3. RP – Investigating IR Radiation 4. Reflection of light (SS) 5. Refraction of Light 6. RP Investigating reflection and refraction of light (SS) 7. Lenses 1 (SS) 8. Lenses 2 (SS, SHO lesson) 9. Magnification (SS) 10. Colour (SS) 11. Atoms (Recap) 12. Changing Atomic Theories 13. Physics of Atoms 14. Introducing Radioactive Decay 15. Types of Radioactive Decay 16. Decay Equations 17. Half Life 18. Modelling Radioactive Decay 19. Irradiation & Contamination 20. Using radiation in medicine (SS) 21. Background radiation (SS) 22. Evaluation Hazards (SS) 23. Nuclear fission (SS) 24. Nuclear fusion (SS)	1. Circuit Symbols & Drawing Circuits 2. Calculating Current & Charge Flow 3. Series & Parallel – Current 4. Series & Parallel – Potential Difference 5. Ohms Law 6. Resistance in Series & Parallel 7. RP – Resistance in lengths of wire (1) 8. RP – Resistance in lengths of wire (2) 9. Thermistors 10. RP – IV Characteristics (1) 11. RP – IV Characteristics (1) 12. Mains Electricity (AC & DC) 13. Plugs 14. Calculating Power (P=IV & P=I2R) 15. Calculating Energy Transferred 16. Equations Practice (optional) 17. Electromagnets (Recap) 18. National Grid & Transformers 19. Transformers structure and equation (SS, HT) 20. Transformer power equation (SS, HT) 21. Static electricity (SS) 22. Electric fields (SS) 23. Recap atoms, elements (SS, SHO)	1. Exothermic & Endothermic Reactions 2. RP – Temperature Changes (1) 3. RP – Temperature Changes (2) 4. Reaction Profiles 5. Bond Energy (HT only) 6. Electrochemical cells and voltage (SS) 7. Rechargeable and non-rechargeable batteries (SS) 8. Fuel cells 9. Half equations for fuel cells 10. Word Equations and Conservation of Mass 11. Balancing equations recap (SS, SHO) 12. Relative Formula Mass 13. Measuring the Rate of Reaction 14. Factors Affecting Rates of Reaction 15. Introducing Moles 16. Limiting Reactants (HT only) 17. Drawing Rates of Reaction Graphs 18. RP – Investigating Effect of Concentration on the ROR (1) 19. RP – Investigating Effect of Concentration on the ROR (2) 20. Catalysts 21. Reversible Reactions	1. Solar system (SS) 2. Life cycle of a star (SS) 3. Orbits 1 (SS) 4. Changing orbits (SS) 5. The Doppler Effect (SS) 6. Dark energy and dark matter (SS) 7. Black bodies and radiation on Earth (SS) 8. The Early Earth's Atmosphere 9. Theories of the atmosphere 10. The Greenhouse Effect 11. Evidence for the greenhouse effect 12. Effects of global warming 13. Reducing our carbon footprint 14. The Harmful Effects of Combustion 15. Resources used by humans 16. Sustainable development 17. Potable Water 18. Desalination 19. Evaluating potable water methods 20. RP - Analysing water samples 21. Waste Water 22. Sewage Treatment 23. Phytomining and bioleaching 24. Life Cycle Assessment 25. Reduce, Reuse, Recycle

Science Curriculum Map

	25. Rates of Reaction in the Body 26. Diffusion 27. Diffusion and surface area 28. Diffusion in action 29. Kidneys and their function (SS) 30. Kidneys and ADH (SS) 31. Treating Kidney failure dialysis (SS) 32. Treating Kidney failure kidney transplant (SS) 33. Microorganisms recap (SS, SHO) 34. Multiplying bacteria (SS) 35. Culturing microorganisms (SS) 36. RP Investigating antiseptics (SS) 37. Monoclonal antibodies (HT, SS) 38. The Eye (SS) 39. Myopia and Hyperopia (SS)	23. RP – Factors Affecting Photosynthesis (2) 24. Using Glucose & Nitrogen in Plants 25. Plant Diseases (SS) 26. Tropisms (SS) 27. Plant Hormones (HT, SS) 28. RP Germination 1 (SS) 29. RP Germination 2 (SS) 30. RP Germination 3 (SS, SHO lesson) 31. Carbon Cycle 32. Water Cycle 33. Rate of Decay (SS) 34. Biogas generators (SS) 35. RP – Decay Part 1 (SS) 36. RP – Decay Part 2 (SS) 37. Biodiversity and human impact 38. Maintaining biodiversity 39. Food security (SS)	25. Particle Model – Density & States 26. RP – Calculating Density 27. Changes of State 28. Heating & Cooling Graphs 29. Latent Heat 30. Specific Heat Capacity 31. Comparing SHC & SLH (HT only) 32. Pressure in Gases 33. Pressure in gases part 2 (SS) 34. Pressure in liquids and hydraulics (SS) 35. Pressure at different depths (SS, HT) 36. The Atmosphere (SS) 37. Floating and Sinking (SS) 38. Recap Insulation (SS, SHO) 39. RP Investigating thermal insulators (SS)	24. Metals and Non Metals 25. Uses of Metals 26. Corrosion (SS, HT) 27. Corrosion Prevention (SS, HT) 28. Transition metals (SS) 29. Properties of Transition metals (SS) 30. Alloys 31. Uses of Alloys (SS) 32. Nanoparticles (SS) 33. Reactivity series and displacement reactions (Practical) 34. Ionic half equations for displacement (Higher only) 35. Reactivity series and extraction methods 36. REDOX 37. Electrolysis of molten compounds (ionic half equations - higher only) 38. Electrolysis of aqueous compounds (ionic half equations - higher only) 39. RP - Electrolysis (1) 40. RP - Electrolysis (2)	22. Chatelier Principles (HT only) 23. Atom economy (SS) 24. Introducing moles (HT) 25. Reacting Masses (HT only) 26. Percentage yield (SS) 27. Concentration 28. Using concentrations of solutions (SS, HT) 29. Introduction to titrations (SS) 30. RP Titrations Part 1 (SS) 31. RP Titrations Part 2 (SS) 32. Calculating the volume of gas (SS, HT) 33. Identification of Ions (SS, SHO) 34. Testing for Ions (SS, SHO) 35. RP Testing for Ions (SS, SHO) 36. Flame emission spectroscopy (SS, SHO)	26. Ceramics and composites (SS) 27. Polymers (SS) 28. The Haber process (SS) 29. Le Chatliers Principle and the Haber Process (SS) 30. NPK fertilisers
Assessment & Educational Visit Opportunities		Trip – Ecological Sampling techniques??	Hinkley point Power Station https://www.edfenergy.com/energy/education/visitor-centres/hinkley-point-visitor-centre			Trip – Wessex water treatment – links to both chemistry and biology?? https://www.wessexwater.co.uk/community/education/key-stages-3-and-4 Separates – Royal Society Summer Exhibition (July) https://royalsociety.org/science-events-and-lectures/about-exhibitions/exhibitors/schools-programme/

Science Curriculum Map

Year 11						
Learning Period	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Discipline	**Chemistry**	**Biology**	**Physics**			
Topic	Organic Chemistry & Cell Biology	Evolving Organisms	Electricity & Magnetism	Revision	Revision	
Big Ideas in Science	1. How does chemistry affect the Earth? 2. What gives substances their properties? 3. What are living things made of? 4. How do organisms grow and reproduce?	1. Why are living things so diverse? 2. What are living things made of? 3. What keeps organisms healthy?	1. What is electricity and magnetism? 2. How does information and energy spread?			
Substantive knowledge	- Bonds form between two non-metal atoms. - The formation, composition and uses of crude oil. - Carbon forms a range of compounds, including chains and ring structures. - Crude oil is a finite resource found in rocks, main from the remains of plankton over millions of years. - Bonding, structure and properties of hydrocarbons including alkanes - Bromine water can be used to test for the presence of alkenes. - How crude oil can be separated into different useful fractions. - Long chain hydrocarbons can be broken into useful short chain hydrocarbons by cracking - The bonding and properties of polymers. - Alkenes are hydrocarbons with a double carbon-carbon bond. - Alkenes react with hydrogen, water and halogens by the addition atoms across the carbon-carbon-double bond, becoming a single carbon-carbon bond. - Alcohols contain the OH functional group. - Carboxylic acids have the COOH functional group. - Polymers are made from alkenes by addition polymerisation. - Monomer with two functional groups can be joined through condensation polymerisation and releasing a water molecule. - The role of DNA in biological organisms. - How and why cells replicate and the stages of the cell cycle. - What are stem cells and how can they be used in therapeutic treatments. - Plants and animals can be clone to produce genetically identical cells. - How organisms reproduce by asexual and/or sexual reproduction. - New gametes are formed through the process of meiosis. - Some characteristics are controlled by single genes and predicting the possible alleles of offspring	- Organisms are grouped into different classifications. - The theory of evolution by natural selection and how it relies upon variation and random mutations. - The evidence supporting Darwin's Theory of evolution. - The lineage of organisms can be displayed using evolutionary trees. - How fossils are formed and used as evidence for evolution. - Organisms evolve by natural selection. Individuals with characteristics suitable to the environment are favoured and are passed onto offspring. - Extinction occurs when there are no remaining individuals of a species alive. - A variety of factors including climate, volcanic eruptions, and meteorite impacts may have influenced extinction events within Earth's history. - The structure and function of the human nervous system. - The difference between a conscious and unconscious decision and its protective benefits. - Caffeine is a stimulant that can effect an individuals reaction time. - The regulation of conditions inside the human body. - The structure and function of the human endocrine system. - Body temperature is monitored and controlled by the thermoregulatory centre in the brain. - The role of adrenaline and thyroxine inside the human body. - Hormones controls the water level in the body - How the body maintains blood glucose levels. - Causes and treatments of diabetes. - The role of the menstrual cycle and the hormones that control it. - Hormonal and non-hormonal types of contraception. - The process of IVF - Embryos can be screened for genetic disorders, this has advantages and disadvantages.	- Magnets produce magnetic fields and can be induced or permanent - A moving charge creates a magnetic field - Electromagnets are a solenoid with an iron core - Electromagnets placed in a permanent magnet generate the motor effect. - Electromagnetics effects are used in a wide variety of devices. - Calculating force using magnetic flux density. - Energy and not matter is transferred using waves. - Methods to measure wave speed and the period of a wave. - The electromagnetic spectrum is a continuous and its types have shared and different properties - Uses of Radio waves and Microwaves - Sound waves can travel through solids causing vibrations - Describe how the ear works to detect sound - Ultra sound and seismic waves can be used to detect different substances and for exploration. - Inertia is the tendency for motion to remain unchanged and that inertial mass is how difficult it is to change the velocity of an object. - How stopping distances are calculated and the factors that affect it. - How energy is transferred when an object stops. - Momentum is a property of all moving objects and it is conserved in a collision. - Investigating the relationship between force and extension. -		-	-

Science Curriculum Map

	- Some disorders are inherited from parents (cystic fibrosis and polydactyly) - Determining the sex of the offspring from sexual reproduction. - Embryos can be screened for genetic disorders, this has advantages and disadvantages. - Interpreting family tree genetic diagrams - The process of genetically engineering organisms - The process of selectively breeding organisms for advantageous genotypic and phenotypic traits.					
Disciplinary Knowledge	- Use good scientific vocabulary to clearly articulate scientific concepts. - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Considering the ethical limitations and issues associated with science. - Appreciate the power and limitations of science	- Use good scientific vocabulary to clearly articulate scientific concepts. - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Considering the ethical limitations and issues associated with science. - Understand how scientific theory changes and develop over time. - Explain how experimental data can lead to changes in models or theories. - Evaluate whether data supports or limits scientific theory. - Formulate and test hypotheses - Explain the need for control variables within an experimental context.	- Use good scientific vocabulary to clearly articulate scientific concepts - Use a variety of models and diagrams to assist in the formulation of clear and concise explanations of core scientific concepts. - Explain everyday and technological applications of sciences, evaluate associated personal, social, economic and environmental implications. - Use an appropriate method to gather data and display results using a graph. - Carry out mathematical equations. - Use appropriate units during mathematical calculations. - Understand the meaning of prefixes in scientific units and utilise this knowledge to confidently convert between units in a variety of scientific contexts. - Present calculated values to an appropriate number of significant figures. - Use specific equipment to demonstrate and prove scientific theory. -	-	-	-
Lesson Sequence	1. Ionic Bonding (SS) 2. Metallic Bonding (SS) 3. Ionic compounds 4. Properties of ionic compounds 5. Covalent Bonding (recap) 6. Crude oil and human impact 7. Drawing alkanes and alkenes 8. Properties of alkanes and alkenes 9. Testing for Alkenes 10. Combustion 11. Fractional Distillation 12. Cracking 13. Alkene reactions (SS) 14. Alcohols (SS) 15. Making alcohols by fermentation (SS) 16. Carboxylic acids and their reactions (SS) 17. Esters(SS) 18. Polymers recap (SS) 19. Addition polymerisation (SS)	1. Classification 2. Variation & Mutation 3. Natural Selection & Evolution 4. Comparing theories of evolution (SS) 5. Evidence for Evolution 6. Genotypes and phenotypes 7. Genetic cross diagrams 8. Gregor Mendel (SS) 9. Evolutionary trees 10. Fossils 11. Fossil practical (SS, SHO) 12. Extinction (SS, SHO) 13. Genetic modification 14. Genetic engineering 15. The Nervous System 16. Conscious & Unconscious Decisions 17. RP – Reaction time (1) 18. RP – Reaction time (2) 19. Homeostasis 20. Thermoregulation (SS) 21. The Endocrine System	1. Electricity recap (SS) 2. Magnets 3. Magnetic Fields 4. Electromagnets 5. Uses of electromagnets (SS) 6. Motor Effect 7. FBIL (HT) 8. DC motors 9. Calculating Force (Magnetic Flux Density) 10. The Generator Effect (SS) 11. Application of the motor effect and generators (SS) 12. Radios 13. Transformers 14. Introduction to waves 15. Waves equation 16. Measuring speed of sound 17. Measuring period of a wave 18. RP: Measuring speed of a wave using a ripple tank (1) 19. RP: Measuring speed of a wave using a ripple tank (2)	**Interleaved practice and application to different contexts** Address gaps in knowledge and build on links between different topics when applied to a range of scenarios Biology Paper 2 Chemistry Paper 2 Physics Paper 2 Paper 2 Mock Exams	**Interleaved practice and application to different contexts** Address gaps in knowledge and build on links between different topics when applied to a range of scenarios Biology Paper 1 Chemistry Paper 1 Physics Paper 1	

Commented [KS1]: What is the rationale for this here in the OCL curriculum? Useful revision (and if current cohort is anything to go by is required). I can see why I would do a covalent bonding recap here, but less so for ionic and metallic.

Commented [RN2R1]: Rationale is just revision. Agree ionic and metallic don't link. Happy for them to be removed

Commented [KS3R1]: I'm going to leave as I think we have time, and it would be good revision and by doing this here, a good start into the year and also interleaved practice/retrieval for them

Commented [KS9]: Does this lesson include Flemings left hand rule?

Science Curriculum Map

	20. Condensation polymerisation (SS) 21. Naturally occurring polymers (SS) 22. Animal and plant cells (Recap) 23. DNA 24. The structure of DNA (SS) 25. Cell Cycle & Mitosis 26. Stem Cells 27. Therapeutic Cloning 28. Cloning Plants (SS) 29. Cloning animals (SS) 30. Asexual Reproduction 31. Sexual Reproduction 32. Meiosis 33. Genotypes & Phenotypes 34. Genetic Cross Diagrams 35. Genetic diseases 36. Protein synthesis (SS) 37. Sex determination 38. Family trees 39. Selective Breeding	22. Adrenaline & Thyroxine (HT) 23. Negative Feedback loops HT) 24. Controlling Blood Glucose 25. Diabetes 26. Controlling water part 1 (SS) 27. Controlling water part 2 (SS) 28. Puberty and The Menstrual Cycle 29. Hormones of The Menstrual Cycle 30. Contraception 31. IVF (HT) 32. Embryo Screening 33. Comparing Hormonal & Nervous System	20. RP: Investigating waves using 21. EM spectrum 22. Uses of Radio waves & Microwaves (Recap) 23. Radio waves (SS) 24. Sound waves (SS) 25. Detection of waves (SS) 26. Seismic Waves (SS, SHO) 27. Inertia and Inertial Mass (higher only) 28. Stopping distances 29. Energy transfers in stopping 30. Momentum 1 (HT) 31. Momentum 2 (HT) 32. RP – relationship between force and extension (1) 33. RP – relationship between force and extension (2) 34. Moments (SS, SHO) 35. Levers and Gears (SS, SHO)			
Assessment & Educational Visit Opportunities		Autumn Mocks Paper 1	Spring Mocks – Paper 2 only		Final GCSE exams	Final GCSE exams

Commented [KS7]: Is this the same lesson, but called something different? OCL is calling it Negative Feedback Loop.

Commented [RN8R7]: Neg Feedback loop can be removed as long as this is explicitly taught through examples adrenaline, thyroxine, & water control. Check the neg feedback loop to ensure coverage of this is inlcuded in other lessons

Commented [KS4]: Are you combining lessons here for combined? If so as separates go into more depth in cloning, should we separate out?

Commented [RN5R4]: Happy for you to split out. They will have done stem cells in year 9 already but worth revisiting so cloning makes sense

Commented [KS6R4]: I've split them out as feel they would be beneficial to them

Commented [KS10]: I've reordered this slightly, I feel waves would follow on better first than this section.

Commented [RN11R10]: Agree