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| **Bridgewater High Key Stage 3 Curriculum Map** |
| Science – Year 7 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | **Autumn Term 2** | **Spring Term 1** | **Spring Term 2** | **Summer Term 1** | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | Working Scientifically 1 ( change from old intro unit 2020)  Chemistry 1-Particles | Biology 1-Cells  Physics 1- Energy  Chemistry 2-Separating techniques | Physics 2- Electrical Circuits  Biology 2-Reproduction  Chemistry 3- Reactions | Biology 3- Ecology  Physics 3- Forces | Biology 4- Classified  Chemistry 4- Acids and Alkalis | Physics 4- Solar System  ***Working Scientifically 2 (under review 2020/21)*** |
|  | **Key Knowledge & Concepts** | | Safety in science, using scientific equipment, recording results and displaying as graphs  WS1 Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas;  WS1 Can ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience  WS1 Can select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate  WS1 Can interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions  Properties of the different states of matter and the particle model; reversibility of state change  “Brownian motion” in gases and diffusion in liquids and gases | Cells as the fundamental unit of living organisms; cell structure and function and using a light microscope; similarities and differences between plant and animal cells; the role of diffusion; unicellular and multicellular organisms.  Comparing energy values of different foods (from labels) (kJ)  Fuels and energy resources.  Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change  Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy  Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography and the identification of pure substances | Static electricity and transfer of electrons; the idea of electric field; electric current, measured in amperes; series and parallel circuits, and current as flow of charge; differences in resistance  Reproduction in humans: the structure and function reproductive systems, menstrual cycle gametes, fertilisation, gestation and birth, effect of maternal lifestyle on the foetus through the placenta  Chemical reactions as the rearrangement of atoms representing chemical reactions using formulae and using equations; the difference between chemical and physical changes. | Interdependence of organisms in an ecosystem, including food webs. Feeding relationships in food chains  Forces as pushes or pulls from the interaction between two objects; using force arrows in diagrams; balanced and unbalanced forces.  Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water  Forces measured in newtons, measurements of stretch or compression as force is changed | Differences between species  Specie adaptations for survival; competition and idea of extinction  Acids and alkalis in terms of neutralisation reactions; the pH scale for measuring acidity/alkalinity; and indicators; reactions of acids with metals to produce a salt plus hydrogen  reactions of acids with alkalis to produce a salt plus water | Gravitational field strength, planets and stars, Earth and Moon phases; our Sun as a star and Earth’s tilt, day length and seasons    **WS2 -Analysis and evaluation**  **Apply mathematical concepts and calculate results; present observations and data using appropriate methods (tables and graphs)**  **Can interpret observations and data to draw conclusions** |
|  |  | | Working scientifically embedded across units and scheme of learning- (*under review 2020/21)- as well as move to discrete WS units across KS3* | | | | | |
| **Clarity around Sequencing** | **Main links across the curriculum 1** | | Year 7  C2: Sep techniques  B1 : Cells  P2 circuits  Year 8  C7 Particles and change  B5 food digestion  Year 9  C10 more chem reactions  Year 10  B1 B2 : Cell structure and organisation  P6 Molecules and matter  P7 Radioactivity  C1 Atoms  Year 11  C8 Rates and equilibrium | Year 7  C1: Particles  B2 reproduction  Year 8  B6 Breathing respiration  B8 Microbes  P9 Heat transfers  B5 food digestion  Year 9  B9 Genetics  B10 fit and healthy  P10 Energy and Electricity  C10 more chem reactions  Year 10  P123 Energy  B1 B2 : Cell structure and organisation  B2 cell division  B3 B4 Organisation  B567 Diseases and prevention  B8 B9 Respiration  B10 Human nervous system  C1 atomic structure  C7 Energy changes  P6 Molecules and matter  P4 P5- electricity  Year 11  C12 chemical analysis  B11 B12 Hormonal homeostasis  B13 B14 B15 Reproduction Variation Genetics Evolution | Year 7  C1: Particles  B1 Cells  C4 Acids  Year 8  C5 Formulae  C6 Reactions contd  C7 Particles and change  P8 Magnets  B8 Microbes  Year 9  C10 more chem reactions  C11 Metal reactions  P10 Energy Electricity  B9 Genetics  Year 10  B1 B2 : Cell structure and organisation  P7 Radioactivity  P123 Energy  P45 electricity  C5 Chemical reactions  C6 electrolysis  C7 energy changes  Year 11  P15 electromagnets  B13 Reproduction  C12 chemical analysis  C9 Crude oil and fuels | Year 7  B4 classified  P1 energy  P4 Solar system  Year 8  B7 On the Farm  P6 pressure  P8 Magnets  Year 9  P11 Gravity motion  P10 Energy electricity  Year 10  P6 Molecules and matter  P123 Energy  Year 11  B16/17/18 Ecology  B14 B15 Variation Evolution  P8 9 10 11 Forces  P15 electromagnets | Year 7  B3 Ecology  C1 Particles  C3 Reactions  Year 8  B8 Microbes  B8 Microbes  C6 Reactions contd  Year 9  B9 Genetics  C10 more chem reactions  C11 Metal reactions  Year 10  B1 B2 : Cell structure and organisation  B5 diseases  C5 Reactions  C4 Quantitative chemistry  Year 11  B16/17/18 Ecology  B14 B15 Variation Evolution  C13 Atmospheric Chemistry | Year 7  P3 Forces  Year 8  P6 pressure  Year 9  P11 Gravity motion  P10 Energy electricity  Year 10  C4 Quantitative chemistry  Year 11  P16 space  P8 9 10 11 Forces |
|  | **Cross – curricular / Authentic Links 2** | | Y7 Food tech: Hygiene and Safety Autumn 1  Y7 Maths: Lines and angles Summer 1  Y8 Maths: Plotting and interpret graphs, representing data Autumn 2  Y9 Food Tech : safety and Hazards Autumn 1 +2  Y9 Maths Straight line graphs Autumn 1  Y9 Maths interpreting graphs Summer 2  Y10 Maths Collecting, representing and interpreting data Summer 1 | Y7 Maths: Multiplication & division Spring 1  Y8 Tech units of measurement Autumn 1 + 2 | Y9 Food Tech : Raising agents Autumn 1 +2  Y10 RS Sexual relationships autumn 2. | Y7 Maths: algebraic notation Autumn 1  Y8 Tech units of measurement Autumn 1 + 2  Y9 Geog characteristics of adaptations Summer 1  Y9 Maths algebraic representation Summer 2  Y10 Maths Collecting, representing and interpreting data Summer 1 | Y9 Food Tech : Raising agents Autumn 1 +2 |  |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: A selection of 21 science stories of discovery are read with the pupils at various points across the scheme of learning at KS3  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term’ Pupils to develop understanding of common scientific prefixes and suffixes | | | | | |
|  |  | **Ext. Writing** | **Writing**: Strategies to encourage ‘extended writing’ that force links to be made with varying scientific concepts are promoted in the use of specific strategies eg ‘Because, But, So’ and ‘Frayer model’ ‘Appositives’ | | | | | |
|  |  | **Key**  **Vocabulary 4** | Variables, particle, continuous, category, diffusion | Stores, pathways, nucleus, specialized, mixtures, solutions | Series, parallel, electron, puberty, sexual intercourse, chemical, physical, | Adaptations, food webs, newtons, density, friction | Vertebrates, invertebrates, variation, indicators, neutralisation, | Planets, orbits, stars |
| **Memory & Cognition** | **Retrieval/ Formative Assessment** | **Start** | Retrieval roulette used each lesson (apart from practical lessons) | | | | | |
|  |  | **On going** | Open/Closed Questioning throughout  Mini-Whiteboards | | | | | |
|  |  | **End** | Brain Dumps  Say it again, Say it better  Concept linking | | | | | |
| **Assessment** | **Summative**  **Assessment** | | 1. HALF TERMLY QMA 1 | 1. HALF TERMLY QMA 2  *2. TCAT QMA 1 November* | 1.HALF TERMLY QMA 3 | 1.HALF TERMLY QMA 4  *2. TCAT QMA 2*  *March* | 1.HALF TERMLY QMA 5 | 1.HALF TERMLY QMA 6 |
|  | **Possible misconceptions 5** | | WS1  Types of graphs, scales on graphs, analysis vs evaluation  Particles  Particle diagrams of liquids, pressure acting in all directions | Cells  Nucleus as brain/control centre  Plant vs animal organelles  Energy  Differentiation between stores and pathways, pollution by carbon dioxide  Separating Tech  Solute/Solvent/solution,  Melting vs dissolving, solutions evaporating (rather than water evaporating) | Electrical circuits  Electricity flowing as opposed to electrical current, how electrons move,  Reproduction  Nuclei fusing at fertilisation, uterus muscles contract, placenta vs umbilical cord function  Reactions  Chemical/physical changes link to physical actions/must use chemicals | Ecology  Consumer/producer, energy levels, pyramid numbers/biomass  Forces  Density as heaviness, weight/mass, concept of reaction force | Classified  Variation  Acids  Neutralisation only happens when exact amounts used, changes in pH during neutralisation, | Solar system  Astronauts float due to no gravity in space, gravity is a force exerted by one object rather than an interaction. |
| **Aspiring, inspiring and Real** | **Links to real world (Inc. SMSC / PD curricula) 3** | | Y7 Working Scientifically 1 |  | Y7 Reproduction  Y7 Electrical circuits  Y7 Reactions |  | Y7 Classified  Y7 Acids |  |
|  |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals. By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | |
|  | **Science enrichment/extracurricular** | |  | **United utilities STEM** |  |  |  | **Big bang fair North West** |

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| **Bridgewater High Key Stage 3 Curriculum Map** |
| Science – Year 8 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | Physics 5 Light  Biology 5 Food and Digestion  Chemistry 5 Formulae and equations | | Physics 6 Pressure and Levers  Biology 6 Breathing and Respiration  Chemistry 6 Reactions continued | | Physics 7 Sound waves  Biology 7 On the farm | | Chemistry 7 Particles and Change  Physics 8 Magnets | | Chemistry 8 Chemical resources  Biology 8 Microbes and disease | | Physics 9 Heat transfers  Chemistry 9 Environmental Chemistry |
| **Key Knowledge & Concepts** | | Similarities and differences between light waves;  Speed of light;  The transmission of light through materials; colours and the different frequencies of light, white light and prisms.  use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye  Content of a healthy human diet; the tissues and organs of the human digestive system adaptations to function; Aerobic and anaerobic respiration in living organisms,  the Periodic Table: periods and groups; metals and non-metals  the properties of metals and non-metals  Differences between atoms, elements and compounds; chemical symbols and formulae for elements and compounds; the varying physical and chemical properties of different elements | | Simple machines give bigger force but at the expense of smaller movement  Moment as the turning effect of a force; atmospheric pressure, decreases with increase of height as weight of air above decreases with height;  pressure in liquids, increasing with depth; upthrust effects, floating and sinking  The structure and functions of the gas exchange system in humans; aerobic and anaerobic respiration in living organisms.  Representing chemical reactions using formulae and using equations; combustion, thermal decomposition, oxidation and displacement reactions | | Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound    Sound needs a medium to travel, the speed of sound in air, in water, in solids;  Sound produced by vibrations of objects; sound waves are longitudinal  Auditory range of humans and animals.  Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots;  Word summary for photosynthesis  the adaptations of leaves for photosynthesis. | | The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition; atoms and molecules as particles.  Magnetic poles, attraction and repulsion; magnetic fields by plotting with compass, representation by field lines; Earth’s magnetism, compass and navigation and  the magnetic effect of a current, electromagnets, D.C. motors (principles only). | | The properties of metals and non-metals and the use of carbon in obtaining metals from metal oxides  ***Differences between bacteria, viruses and fungi; the role of passive and active immunity against disease; disease categories and prevention of spread (not part of NC)*** | | Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators  The production of carbon dioxide by human activity and the impact on climate.  the composition of the atmosphere |
|  |  | | Working scientifically embedded across units and scheme of learning- (*under review 2020/21)- as well as move to discrete WS units across KS3* | | | | | | | | | | |
| **Clarity around Sequencing** | **Main links across the curriculum** | | LIGHT - Energy (Y7), P12/13/14 Waves & Light(Y11),  FOOD & DIGESTION - Cells (Y7), Energy (Y7), fit& Healthy (y9) B3 Organisation of Digestive system (Y10),  FORMULAE & EQNS -  Reactions Cont’d (Y8), More Chemical Reactions (Y9), Metal reactions (Y9), C1, C2, C3, C4, C5, C6, C7 (Y10), C8, C9/10/11, C12, C15 (Y11) | | PRESSURE & LEVERS -  Particles (Y7), Forces (Y7), P6 Particles (Y9 transition), C8 (Y10), P8/9 Forces 1 (Y11), P10 Forces 2 (Y 11)  BREATHING & RESPIRATION -  Cells (Y7), Reactions (Y7), Fit & Healthy (Y9), B1 Cells 7 Organisation (y10), B4 Organising animals/plants (Y10), B9 Respiration (Y10), C12 Chemical analysis (Yr11), C13 Chemistry of the Atmosphere (Y11)    REACTIONS CONTINUED -  Formulae and Equations (Y8), More Chemical Reactions (Y9), Metal reactions (Y9), C1, C2, C3, C4, C5, C6, C7 (Y10), C8, C9/10/11, C12, C15 (Y11) | | SOUND WAVES Particles (Yr7), Energy (y7), P12/13/14 Waves & Light (y11)  ON THE FARM -  Cells (y7), Environmental Chemistry (Y8), Food and digestion (Y8), Breathing & respiration (y8), B4 Organising animals/plants (Y10), B8 Photosynthesis (y10), B16/17/18 Ecology (y11), C15 Using our resources (Y11) | | PARTICLES & CHANGE-  Particles and matter (Y7), Separating Techniques, (Y7), Reactions (y7),  Acids & Alkalis (Y7), C5 Chemical Reactions (Y10)  MAGNETS – Electricity (y7), P15 Electromagnets (y11), Separating Techniques (Y7), Particles & Change (y8), C3 Bonding & Structure (Y10) | | CHEMICAL RESOURCES- Ecology (Y7), B16/17/18 Ecology (Y11), Reactions continued (Y8), Metal reactions (Y9), C14 The earth’s resources.  MICROBES AND DISEASE- Cells (Y7), On the farm (Y8), B1 Cells and organisation (Y10), B5/B6/B7 Diseases (Y10), B16/17/18 Ecology (Y11) | | HEAT TRANSFERS- Particles (Y7), Energy (Y7), P6 Particles (Y9 transition), Particles and change (Y8), C7 Energy changes (Y10), P1/2/3 Energy (Y10)  ENVIRONMENTAL CHEMISTRY- Metal reactions (Y9) B17/18 Ecology (Y11), C13 Chemistry and the atmosphere (Y11) |
| **Cross – curricular / Authentic Links** | | MATHS:  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Developing number sense  Y8 Algebraic techniques  FOOD TECH:  Y7 Food for good health  Y7 Dairy  Y9 Diet and Health  PE:  Y11 Health, fitness & wellbeing | | MATHS:  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Developing number sense  Y8 Algebraic techniques  PE:  Y10 Applied anatomy & physiology | | GEOGRAPHY:  Y10 Resource Management | | GEOGRAPHY:  Y7 OS Maps | | FOOD TECH:  Y7 Hygiene and safety  HISTORY:  Y10 Medicine through time | | GEOGRAPHY:  Y9 Volcanoes |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: A selection of 21 science stories of discovery are read with the pupils at various points across the scheme of learning AT KS3  **Speaking**: Decoding words should be common practice in many science lessons; again, use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term’ Pupils to develop understanding of common scientific prefixes and suffixes | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage ‘extended writing’ that force links to be made with varying scientific concepts are promoted in the use of specific strategies eg ‘Because, But, So’ and ‘Frayer model’ ‘Appositives’ | | | | | | | | | | |
| **Key**  **Vocabulary** | Luminous, transparent, translucent, opaque, reflection, refraction, dispersion, Enzyme, digestion, villi, absorption, element, mixture, compound, atom, molecule, particle, valency, symbol, reactant | | Hydraulic, pivot, moment, perpendicular, lever, aerobic respiration, anaerobic respiration, oxygen debt, gas exchange, neutralisation, combustion, thermal decomposition, displacement | | Pitch, amplitude, frequency, wavelength, vacuum, ultrasound, photosynthesis, limiting factor, xylem, phloem | | Field, pole, attraction/repulsion, electromagnet, atom, element, compound, mixture, melting, freezing, evaporating, condensing, state of matter, chemical change, physical change | | Oxidation, corrosion, rusting, ore, mineral, leachate, microbe, pathogen, antibiotic, antibody, antigen. | | Conduction, convection, radiation, atmosphere, photosynthesis, climate, infra-red radiation, absorb, emit, correlation, cause |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson (apart from practical lessons) | | | | | | | | | | |
| **On going** | Open/Closed Questioning Mini-Whiteboards | | | | | | | | | | |
| **End** | Brain Dumps Say it again, Say it better Concept linking Tell me what you know about..... | | | | | | | | | | |
| **Assessment** | **Summative**  **Assessment** | | 1. HALF TERMLY QMA1 | | 1. HALF TERMLY QMA2  *2. TCAT QMA 1 November* | | 1. HALF TERMLY QMA3 | | 1.HALF TERMLY QMA4  *2. TCAT QMA 2*  *March* | | 1. HALF TERMLY QMA5 | | 1. HALF TERMLY QMA6 |
| **Possible misconceptions** | | Light emanates from our eyes  Stomach acid digests food.  Chemical formulae can have non-subscript numbers in them.  Chemical formulae can be changed in order to make equations balance. | | Respiration is breathing.  Blood is blue, it only turns red when it comes into contact with the air.  Chemical formulae can have non-subscript numbers in them.  Chemical formulae can be changed in order to make equations balance. | | Definition of amplitude.  Plants always release oxygen- they do not respire. | | Filtration and sieving are the same thing.  Drinking water is pure.  Substances disappear when they dissolve.  All metals are magnetic. | | All microbes cause disease.  Antibiotics can be used to kill all pathogens. | | Greenhouse effect and global warming are the same thing.  Cold travels around from place to place. |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Food and digestion | | Pressure and Levers, Breathing and respiration, Reactions Cont’d | | Sound,  On the farm | | Particles and change, Magnets | | Chemical Resources,  Microbes and disease | | Heat transfers, Environmental chemistry |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals. By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Science enrichment/extracurricular** | |  |  | | **Unilever Bright futures** | |  | |  | |  | |

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| **Bridgewater High Key Stage 3 Curriculum Map** |
| Science – Year 9 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | Biology 9 Genetics  Chemistry 10 More Chemical Reactions  Physics 10 Energy and Electricity | | | | Biology 10 Fit and Healthy  Chemistry 11 Metal Reactions  Physics 11 Gravity and Motion | | | | Y9 Science discipline mastery work:   1. Maths in Science and Working Scientifically 2. **Cellular biology/ Atoms and particles / Particle model** | | |
| **Key Knowledge & Concepts** | | Heredity;  A simple model of chromosomes, genes and DNA in heredity;  Watson, Crick, Wilkins and Franklin in the development of the DNA model ;  Variation -continuous or discontinuous;  Variation;  ***Genetic engineering and Selective breeding ( Not NC)***  Conservation of mass; changes of state and chemical reactions that lead to chemical change  Comparing power ratings of appliances in watts (W, kW) ; comparing amounts of energy transferred (J, kJ, kW hour)  Processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.  potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current | | | | Structure and functions of the human skeleton;  The function of muscles and examples of antagonistic muscles;  The mechanism of breathing to move air in and out of the lungs; the impact of exercise, asthma and smoking on the human gas exchange system;  The effects of recreational drugs;  The chemical properties of metal and non-metal oxides with respect to acidity.  the order of metals and carbon in the reactivity series  Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)  The representation of a journey on a distance-time graph; Relative motion: trains and cars passing one another. | | | | **Cell Biology**  Animal cells  Plant cells  Using a light microscope  Eukaryotes and prokaryotes  Cell differentiation and specialization  Microscopy  Chromosomes  *Mitosis and the cell cycle*  Stem cells  Diffusion  **Atomic structure and the periodic table**  Atoms, elements and compounds  Mixtures  Scientific models of the atom  Relative electrical charges of subatomic particles  size and mass of atoms  Electronic structure  Relative atomic mass  The periodic table  Development of the periodic table  **Particle model of matter**  Density of materials  Required practical - Density  Changes of state  Internal energy  Temperature changes in a system and specific heat capacity  Required practical - Specific heat capacity  Changes of heat and specific latent heat  Particle motion in gases  Pressure in gases  Increasing the pressure of a gas | | |
| **Clarity around Sequencing** | **Main links across the curriculum** | | **Year 7**  C1 Particles and Matter  B1 Cells  C2 Separating Techniques  P1 Circuits and Electricity  B2 Reproduction  C3 Reactions  P3 Forces  B4 Classification  P4 Energy  **Year 8**  P5 Light  C5 Formulae and Equations  C6 Reactions  B7 On the Farm  C7 Particles and change  P9 Heat Transfers | | **Year 10**  B1/B2 Cells and Organisation  B16/B17/B18 Ecology  C1 Atomic Structure  C2 Bonding and Structure  C3 Quantitative Chem  C4 Chemical Reactions  P1/P2/P3 Energy and Energy Resources  P4/P5 Electricity  **Year 11**  B13 Reproduction  B14/B15 Variation and Evolution | | **Year 7**  C1 Particles and Matter  B1 Cells  C2 Separating Techniques  C3 Reactions  P3 Forces  C4 Acids and Alkalis  **Year 8**  B5 Food and Digestion  C5 Formulae and Equations  B6 Breathing and Respiration  C6 Reactions  C7 Particles and Change  C8 Chemical Resources  B8 Microbes and Disease | | **Year 10**  B1 Cells and Organisation  B3 Organisation and Digestion System  B4 Organising Animals and Plants  B6 Preventing and Treating Diseases  B7 Non communicable disease  B9 Respiration  C1 Periodic Table  C2 Bonding and Structure  C4 Chemical Reactions  P8/P9 Forces 1  **Year 11**  B10 Human Nervous System  B11 Hormonal Coordination  B12 Homeostasis  P8/P9 Forces 1 | | **Year 7**  Working Scientifically  C1 Particles and Matter  B1 Cells  C2 Separating Techniques  P3 Forces  P4 Energy  **Year 8**  C5 Formulae and Equations  C7 Particles and Change  P9 Heat Transfers | | **Year 10**  B1/B2 Cells and Organisation  B3 Organisation and Digestive System  B4 Organising Animals and Plants  B8/B9 Respiration and Photosynthesis  C1 Periodic Table  C2 Bonding and Structure  C3 Quantitative Chem  C4 Chemical Changes  C5 Energy Changes  P7 Radioactivity  P1/P2/P3 Energy and Energy Resources  **Year 11**  B10 Human nervous system  B13 Reproduction  C6 Rates and Equilibrium  P10/P11 Forces 2 |
| **Cross – curricular / Authentic Links** | | **Year 7**  **Maths**  AUT 1 – Use algebraic notation  AUT 2 – Place value and proportion  SPR 1 – Addition, Subtraction, Multiplication and Division  SPR 2 - Using a Calculator, Solving 2 step equations  **Tech**  SPR 2 - Understanding how electricity flows and simple circuits  **Year 8**  **Maths**  AUT 1 – Ratio and Scale  AUT 2 – Working in the Cartesian Plane and Representing Data  SPR 1 – Brackets and Equations  SPR 2 – Developing number | | **Year 9**  **Maths**  AUT 1 – Straight line graphs  SUM 1 - Ratios  **Food Tech**  AUT 1 and 2 – understanding types of raising agents  Understanding chemical, biological and physical raising agents  Understanding how acids and alkalis react to create carbon dioxide  **RS**  SPR 2 – Are science and religion compatible?  SUM 1 and 2 – What does it mean to be human?  **Year 10**  M**aths**  SPR 2 – Ratios  **History**  SUM 1 – Genetics and Lifestyle  **Product Design**  AUT - Electronic Components/Circuits  **Year 11**  **Maths**  AUT 2 - Changing the subject  SUM 1 – Number work incl. Multi-step problem solving  **RS**  SPR 1 – Religion and Life | | **Year 7**  **Maths**  AUT 2 – Place value and proportion  SPR 1 – Addition, Subtraction, Multiplication and Division  SPR 2 – Using a Calculator  **Tech**  AUT 1 – Understanding processing of metals  **Year 8**  **Maths**  AUT 1 – Ratio and Scale  AUT 2 – Working in the Cartesian Plane and Representing Data  SPR 1 – Brackets and Equations  SPR 2 – Developing number  **Year 9**  **Maths**  SUM 1-  Work with speed, distance, time  **Food Prep**  SUM 1 – Food and the environment, diet and health  **PE**  AUT 2 – Health and Fitness  **Product Design**  AUT 1 – Metals – primary processing and extraction  Types of shaping/forming | | **Year 10**  **Maths**  AUT 2 - Simultaneous Equations  SUM 1 – Use a line of best fit and understand extrapolation and Collecting, Representing and Interpreting Data  **Food Prep and Nutrition**  AUT 1 and 2 – Healthy eating – Functional properties of food  **History**  SUM 1 – Lung Cancer case study  **PE**  AUT 1 and 2 – Anatomy, Physiology, Movement Analysis  SPR 1 and 2 – Physical Training  SUM 1 – Use of data  **Year 11**  **Maths**  AUT 1 – Gradients and lines  AUT 1 – Speed, distance, time graphs and estimate the area under a curve  AUT 2 – Changing the subject  **PE**  SPR 2 – Health, fitness and well-being | | **Year 8**  **Maths**  AUT 1 - Ratio and scale  SPR 1 – Brackets and equations  SPR 2 – Standard Index form and number sense  SUM 2 – Reasoning with data  **Year 9**  **Maths**  AUT 2 – Work out the volume of cuboids  **Year 11**  **Maths**  SPR 2 – Venn Diagrams  - | |  |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: A selection of 21 science stories of discovery are read with the pupils at various points across the scheme of learning AT KS3  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term’ Pupils to develop understanding of common scientific prefixes and suffixes | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** | Conservation  Potential Difference  Energy  State  Displacement  Thermal decomposition  Combustion | | Heredity  Chromosomes  Genes  Variation | | Acceleration  Gradient  Properties  Acidity  Reactivity  Effervescence  Neutralisation | | Antagonistic  Addiction  Withdrawal  Stamina  Suppleness | | Specific heat capacity  Specific Latent Heat  Collisions  Atoms  Elements  Compounds  Subatomic  Isotope  Electronic Structure | | Microscopy  Organelle  Diffusion |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson (apart from practical lessons) | | | | | | | | | | |
| **On going** | Open/Closed Questioning Mini-Whiteboards | | | | | | | | | | |
| **End** | Brain Dumps Say it again, Say it better Concept linking Tell me what you know about..... | | | | | | | | | | |
| **Assessment** | **Summative**  **Assessment** | |  | | 1. End of unit 1 tests- Biology, Chemistry and Physics  2. TCAT QMA 1 November | |  | | 1.End of unit 2 tests- Biology, Chemistry and Physics  2. TCAT QMA 2 March ( KS3 science) | |  | | 1. End of Y9 work- unit tests- Biology, Chemistry and Physics |
| **Possible misconceptions** | | Definitions for charge and current – wrongly interchanged  Energy dissipating to surroundings rather than energy loss  Gases have mass (Conservation of Mass)  Physical change incorrectly identified as chemical reactions | | Clarity over continuous and discontinuous features  Differences between breed, variety and species | | Speed incorrectly defined as how fast an object travels.  Non-metals taking metallic properties, e.g. conduction | | Clarification of how muscles work around joints  Nutrients within diets, e,g fat is not always bad | | No temperature change during change of state  Idea of empty space in atoms | | The process of diffusion and links to human anatomy |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Genetic Engineering and Selective Breeding  Comparing Power Ratings | |  | | Skeleton and Muscles  Smoking  Drugs  Speed | |  | | Microscoping  Stem Cells  Density | |  |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Enrichment** | | United Utilities STEM project | Unilever Bright futures | |  | |  | |  | |  | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Biology – Year 10 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | B1 Cell structure and Transport  B2 Cell division  B3 Organisation and the Digestive system | | B4 Organising Animals and Plants  B5 Communicable Diseases | | B6 Preventing and treating disease  B7 Non-Communicable disease | | B7 Non-Communicable disease  B8 Photosynthesis | | B9 Respiration  B16 Adaptations, interdependence and competition | | B17 Organising and Ecosystem  B18 Biodiversity and Ecosystems |
| **Key Knowledge & Concepts** | | 4.1 Cell Biology  Chromosomes  Mitosis and the cell cycle  Stem cells  Diffusion  Osmosis  **Required practical 2 - Osmosis**  Active transport  4.2 Organisation  Organizational hierarchy  Enzymes  **Required practical 3 - Food tests**  **Required practical 4- Enzymes**  The human digestive system | | **The heart and blood vessels**  **Blood**  **Coronary heart disease**  **Health issues**  **The effect of lifestyle on some non-communicable diseases**  **Cancer**  **Plant tissues**  **Plant organ system**  **4.3 Infection and response**  **Communicable infectious disease**  **Culturing microorganisms BIO only**  **Required practical 5 - Effect of antibiotics on bacterial growth BIO only**  **Plant organ system**  **Viral diseases**  **Bacterial diseases**  **Fungal diseases**  **Protist diseases**  **Human defense systems**  **Detection and identification of plant diseases BIO only**  **Plant defense responses BIO only** | | **Vaccination**  **Antibiotics and painkillers**  **Discovery and development of drugs**  **Producing monoclonal antibodies BIO only**  **Use of monoclonal antibodies BIO only**  **The effect of lifestyle on some non-communicable diseases**  **Cancer** | | **4.4 Bioenergetics**  **Photosynthetic reaction**  **Rate of photosynthesis**  **Required practical 6 - Photosynthesis**  **Uses of glucose from photosynthesis** | | **Aerobic and anaerobic respiration**  **Response to exercise**  **Metabolism**  **4.7 Ecology**  **Communities**  **Required practical 9 - Field investigations**  **Abiotic factors**  **Biotic factors**  **Adaptations** | | **Levels of organization**  **How materials are cycled**  **Decomposition**  **Required practical 10- Decay BIO only**  **Impact of the environmental change BIO only**  **Biodiversity**  **Waste management**  **Land use**  **Deforestation**  **Global warming**  **Maintaining biodiversity**  **Trophic levels BIO only**  **Pyramids of biomass BIO only**  **Transfer of biomass BIO only**  **Factors affecting food security BIO only**  **Farming techniques BIO only**  **Sustainable fisheries BIO only**  **Role of biotechnology BIO only** |
|  |  | | Working scientifically and Maths skills embedded across units and schemes of learning | | | | | | | | | | |
| **Clarity around Sequencing** | **Main links across the curriculum** | | **Year 7**  B1 cells  B2 reproduction  P4 energy  **Year 8**  B5 food and digestion  B6 breathing and respiration  **Year 9**  B9 genetics  B10 fit and healthy  **Year 10**  B4 organising animals and plants  B8 photosynthesis  B9 respiration  P1/2/3 energy  C6 rates of reaction  **Year 11**  B13 reproduction  B14/15 Variation and evolution | | **Year 7**  B1 cells  **Year 8**  B8 microbes and disease  B6 breathing and respiration  C5 formula and equations  **Year 9**  B10 Fit and healthy  **Year 10**  B1/2 Cells  B6 preventing and treating disease  B7 non communicable disease | | **Year 7**  B1 cells  **Year 8**  B8 microbes and disease  B5 food and digestion  B6 breathing and respiration  **Year 9**  B10 fit and healthy  B9 genetics  **Year 10**  P7 radioactivity  B1/2 cells  B5 communicable disease | | **Year 7**  B1 cells  B3 ecology  P4 energy  **Year 8**  B8 Microbes and disease  B5 food and digestion  B6 breathing and respiration  B7 on the farm  C5 formula and equations  P5 light  C9 environmental chemistry  **Year 9**  B10 fit and healthy  B9 genetics  C10 more chemical reactions  P10 energy & electricity  **Year 10**  P7 radioactivity  B1/2 cells  B5 communicable disease  P1/2/3 energy  B9 respiration  C4 chemical reactions  **Year 11**  B16/17/18 Ecology  P12/13/14 Waves and light | | **Year 7**  B1 cells  B3 ecology  P4 energy  **Year 8**  B5 food and digestion  B6 breathing and respiration  C5 formula and equations  C9 environmental chemistry  **Year 9**  B10 fit and healthy  B9 genetics  C10 more chemical reactions  P10 energy & electricity  **Year 10**  B1/2 cells  P1/2/3 energy  C4 chemical reactions  B8 photosynthesis  **Year 11**  B17/18 Ecology | | **Year 7**  P4 energy  B3 ecology  C4 acids and alkalis  **Year 8**  B7 on the farm  C6 reactions  C8 chemical resources  C9 environmental chemistry  C7 particles and change  **Year 9**  P10 energy  **Year 10**  B16 Ecology  P3 energy  P9 photosynthesis  **Year 11**  C13 chemistry of the atmosphere  C14 the earth's resources  C15 using our resources |
| **Cross – curricular / Authentic Links** | | Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr 7 sets and probabliity  Yr 8-10 Maths Ratio and scale  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 8 Maths probability  Yr 9 Maths constructing in 2 and 3D  Y9 maths algebra  Yr 9 maths using %  Yr10 Food – Diet, nutrition and health  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Food Prep yr 7 Hygiene safety / Food for good health  Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr 10 History - Medicine through time  Yr10 Maths interpreting data  YR10 PE – applied anatomy & physiology  Yr 11 Maths – graphs | | Y8 maths representing data  Y8 maths representing data / working in the Cartesian plane  Year 9 food prep - diet and health  Y9 maths algebra  Yr10 Food – Diet, nutrition and health  Yr 10 History - Medicine through time  Yr10 Maths interpreting data  Yr 11 Maths – graphs  Yr 11 PE Health fitness and wellbeing | | Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr9 maths rates  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr10 Maths interpreting data  YR10 PE – applied anatomy & physiology  Yr 11 Maths – graphs  Yr 11 Maths sample spaces and probablity | | Yr 7 tech – introduction project  Y8 maths representing data / working in the Cartesian plane  Year 9 food prep - food and the environment  Y9 maths algebra  Yr10 Maths interpreting data  Yr 11 Geography – the living world  Yr 11 Maths – graphs  Yr 11 Maths sample spaces and probablity |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** | Prokaryote, eukaryote, mitosis, osmosis, diffusion, active transport, enzyme, active site | | Heart, blood, artery, vein, capillaries, xylem, phloem, transpiration, roots, pathogen, virus, bacteria, protist, fungi | | Vaccine, immune response, white blood cells, antibodies, antibiotics, analgesic, antiinflammatory, cancer | | Photosynthesis, endothermic, cancer, glucose, starch, rate | | Respiration, aerobic, anaerobic, exothermic, ecology, community, population, abiotic, biotic | | Decay, carbon cycle, water cycle, food web/chain, pyramids, biodiversity, pollution, trophic |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) |
| **On going** | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call |
| **End** | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review |
| **Assessment** | **Summative**  **Assessment** | | B1-B2 QMA 1 | | 1. B1-B4 QMA2 2. (TCAT QMA1) | | 1. B1-B7 QMA3 | | 1. B1-B9 QMA4 | |  | | 1. Y10 Mock QMA5  (TCAT QMA2) |
| **Possible misconceptions** | |  | |  | |  | |  | |  | |  |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Safety and risk awareness (Practical work)  Stem cell research | | Safety and risk awareness (Practical work)  Disease in society / pandemics | | Safety and risk awareness (Practical work)  Vaccination  Development of drugs | | Safety and risk awareness (Practical work)  Lifestyle / health / risk factors | | Safety and risk awareness (Practical work) | | Global warming  Safety and risk awareness (Practical work)  Huuman impact on environment |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Enrichment** | |  |  | |  | |  | |  | | Chester Zoo Ecology trip | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Biology – Year 11 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | | **Spring Term 1** | | | **Spring Term 2** | | **Summer Term 1** | | | | **Summer Term 2** | |
| **Clarity around knowledge** | **Theme/Topic** | | B18 Biodiversity and Ecosystems  B10 The Human Nervous System | | B11 Hormonal Coordination  B12 Homeostasis in action | | | B12 Homeostasis in action  B13 Reproduction | | | B14 Variation and Evolution  B15 Genetics and Evolution | | EXAMS | | | | EXAMS | |
| **Key Knowledge & Concepts** | | Impact of the environmental change BIO only  Biodiversity  Waste management  Land use  Deforestation  Global warming  Maintaining biodiversity  Trophic levels BIO only  Pyramids of biomass BIO only  Transfer of biomass BIO only  Factors affecting food security BIO only  Farming techniques BIO only  Sustainable fisheries BIO only  Role of biotechnology BIO only  4.5 Homeostasis and response  Importance of homeostasis  Structure and function of the nervous system  **Required practical 7- Reaction time**  The brain BIO only  The eye BIO only | | Control of body temperature BIO only  Human endocrine system  Control of blood glucose concentration  Maintaining water and nitrogen balance in the body BIO only  Hormones in human reproduction  Contraception  The use of hormones to treat infertility HT only  Negative feedback HT only  Plant hormones- control and coordination BIO only  **Required practical 8 - Germination BIO only**  Use of plant hormones | | | 4.6 Inheritance, variation and evolution  Sexual and asexual reproduction  Meiosis  Advantages and disadvantages of sexual and asexual reproduction BIO only  DNA and the genome  DNA structure BIO only  Genetic inheritance  Inherited disorders  Sex determination | | | Variation  Evolution  Selective breeding  Genetic engineering  Cloning BIO only  Theory of evolution BIO only  Speciation BIO only  The understanding of genetics BIO only  Evidence for evolution  Fossils  Extinction  Resistant bacteria  Classification | |  | | | |  | |
| **Clarity around Sequencing** | **Main links across the curriculum** | | Y10  Y10 B8 B9 Bioenergetics:  Y9  Y9 B10 Fit and Healthy- Nervous system;  Y8  Y8 B7 On the Farm;  Y7  Y7 B4 Classified; Y7 B3 Ecology | | Y7  Y7 B2 Reproduction;  Y8  Y8 B7 On the Farm | | | Y7  Y7 B1 Cells; Y7 B2 Reproduction;  Y9  Y9 B9 Genetics ;  Y10  Y10 B2 Cell division  Y10 B567 Disease | | | Y7  Y7 B4 Classification;  Y9  Y9 B9 Genetics; | |  | | | |  | |
| **Cross – curricular / Authentic Links** | | Y7  **Maths**  SPR1  -Addition, Subtraction Multiplication and Divison  -Area of shapes  AUT1  -Finding the mean, median, range, mode  -Place value and ordering  Y8  **Maths**  AUT 1  -Draw and interpret scale  AUT 2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  **Food tech**  Spr1  Sustainability- How food can affect the environment  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Geog  Spr 2  Resource management Food water and energy issues  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | | Y7  **Maths**  AUT1  -Place value and ordering  Y8  **Maths**  AUT2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | | | Y7  **Maths**  AUT1  -Place value and ordering  SUM2  -Probablity  Y8  **Maths**  AUT2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | | | Y7  **Maths**  AUT1  -Place value and ordering  SUM2  -Probability  **Technology**  SPR 2  -To understand how woods are **classified**  Y8  **Maths**  AUT2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  AUT 2  -Discrete and continuous data  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | |  | | | |  | |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | | | | | | |
| **Key**  **Vocabulary** | Ecosystem  Organism  Biotic  Abiotic  Transect  Extremophile  Interdependence | | | Homeostasis  Cerebral cortex  Dialysis  Neurone  Cerebellum  Vasodilation  Vasoconstriction | | | Asexual  Meiosis  Mitosis  Genome  Allele  Homozygous  Heterozygous | | | Genotype  Phenotype  Polydactyly  Evolution  Monohybrid  Evolution  Speciation  Extinction | | |  | | |  |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | | Roulette use each lesson( apart from practical lessons) | | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | | | Roulette use each lesson( apart from practical lessons) | |
| **On going** | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | | Mini Whiteboard use  Cold call | | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | | | Mini Whiteboard use  Cold call | |
| **End** | Practice question review | | Practice question review | | | Practice question review | | | Practice question review | | Practice question review | | | | Practice question review | |
| **Assessment** | **Summative**  **Assessment** | | B16-B18 QMA 5 | | 1. Y11Mock December (TCAT QMA 3) | | | 1. B16-B12 QMA3 | | | 1. Y11 Mock Easter  ( TCAT QMA 4) | | **GCSE Formal exams** | | | |  | |
| **Possible misconceptions** | |  | |  | | |  | | |  | |  | | | |  | |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | **B18 Biodiversity and Ecosystems-**  Impact of the environmental change BIO only  Biodiversity  Waste management  Land use  Deforestation  Global warming  Maintaining biodiversity  Factors affecting food security BIO only  Farming techniques BIO only  Sustainable fisheries BIO only  Role of biotechnology BIO only | | **B11 Hormonal Coordination**  **B12 Homeostasis in action**  Control of blood glucose concentration  Hormones in human reproduction  Contraception  The use of hormones to treat infertility  Use of plant hormones | | | B12 Homeostasis in action  B13 Reproduction  DNA and the genome  Genetic inheritance  Inherited disorders  Sex determination | | | B14 Variation and Evolution  B15 Genetics and Evolution  Selective breeding  Genetic engineering  Cloning BIO only  Theory of evolution BIO only  Evidence for evolution | |  | | | |  | |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | | | | | | |
|  | **Enrichment** | |  |  | | |  | | |  | | | |  | | Chester Zoo Ecology trip | | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Chemistry – Year 10 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | **C1 Atomic Structure and the Periodic Table**  **C2 Bonding and Structure** | | **C2 Bonding and Structure**  **C3 Quantitative Chemistry** | | **C3 Quantitative Chemistry**  **C4 Chemical Changes** | | **C4 Chemical Changes**  **C5 Energy Changes** | | **C5 Energy Changes**  **C6 The Rate and Extent of Chemical Change** | | **C6 The Rate and Extent of Chemical Change** |
| **Key Knowledge & Concepts** | | C1:  Metals and non-metals  Group 0  Group 1  Group 7  Properties of Transition Metals (Chem only)  C2:  Chemical Bonds  Ionic Bonding  Ionic Compounds  Covalent Bonding  Metallic Bonding  Properties of ionic compounds  Properties of small molecules  Polymers  Giant Covalent Structures  Properties of metals and alloys  Metals as conductors | | C2:  The three states of matter  State symbols  Structure and bonding of carbon  Sizes of particles and their properties  Uses of nanoparticles  (Chem only)  C3:  Conservation of mass and balanced chemical equations  Relative formula mass  Mass changes when a reactant or product is a gas  Chemical measurements  Moles  Amounts of substances in equations  Using moles to balance equations  Limiting reactants  Concentration of solutions  Percentage Yield  Atom Economy  Using concentrations of solutions in mol/dm3  Use of amount of substance in relation to volumes of gases (Chem only) | | C4:  Reactivity of metals – metal oxides  Reactivity series  Extraction of metals and reduction  Oxidation and reduction (electrons)  Reactions of acids with metals  Neutralisation of acids and salt production  **Required Practical 1 – Soluble Salts**  pH and neutralisation  Strong and weak acids  **C4: Required Practical 3 - Titrations (Chem only)** | | C4:  Process of electrolysis  Electrolysis of molten ionic compounds  Using electrolysis to extract metals  **Required Practical 3 - Electrolysis of aqueous solutions**  Half equations  C5:  Endothermic and exothermic reactions  **Required Practical 4 – Investigating the variables that affect temperature change** | | C5:  Reaction Profiles  Energy change of reactions  Cells and batteries  Fuel Cells (Chem only)  C6:  Calculating rates of reactions  Factors which affect the rates of chemical reactions | | C6:  **Required Practical 5 – Investigate how changes in concentration affect the rates of reaction.**  Collision theory and activation energy  Catalysts |
|  |  | | Working scientifically and Maths skills embedded across units and schemes of learning | | | | | | | | | | |
| **Clarity around Sequencing** | **Main links across the curriculum** | | **Year 7**  C1 particles & metals  C1 circuits & electricity  C3 Reactions  P3 Forces  P4 energy  **Year 8**  C5 formula & equations  C6 reactions  **Year 9**  P10 energy & Electricity  C11 Metal reactions  C10 More chemical reactions  **Year 10**  C5 Chemical Reactions  C3 Quantitative Chem  C6 electrolysis  P7 Radioactivity  P4 Electric circuits  P8 Forces  **Year 11**  C7 Energy Change  C8 Rates & equilibrium  P16 space | | **Year 7**  C1 Particles & matter  C3 reactions  **Year 8**  C5 formula and equations  C6 reactions  C7 Particles and change  B6 Breathing and respiration  **Year 9**  C10 More chemical reactions  C11 Metal reactions  **Year 10**  C1 Atomic Structure and the Periodic Table  C2 Bonding and Structure  C6 electrolysis  P6 Molecules & matter  **Year 11**  C7 Energy changes  C9/10/11 Organic Chemistry | | **Year 7**  C4 acids and alkalis  C3 reactions  **Year 8**  C5 formula and equations  C6 reactions  C7 Particles and change  **Year 9**  C10 More chemical reactions  C11 Metal reactions  **Year 10**  C1 Atomic Structure and the Periodic Table  C2 Bonding and Structure  C5 electrolysis  P6 Molecules & matter  **Year 11**  C7 Energy changes  C9/10/11 Organic Chemistry | | **Year 7**  P1 Circuits & Electricity  P4 energy  C3 reactions  **Year 8**  C5 formula & equations  C6 reactions  C8 chemical resources  **Year 9**  P10 energy & electricity  C10 more chemical reactions  C11 Metal reactions  **Year 10**  C1 Atomic Structure and the Periodic Table  C2 Bonding and Structure  C5 electrolysis  P4 electricity  **Year 11**  C8 rates and equilibrium | | **Year 7**  P1 circuits & electricity  P4 energy  C3 reactions  **Year 8**  C5 Formula and equations  C6 reactions  C7 particles and change  **Year 9**  C10 more chemical reactions  C8 rates and equilibrium  Year 10  C5 Chemical reactions  P1 Energy  P4 Electricity  B8 photosynthesis  Year 11  C8 Rates and equilibrium | | Year **7**  C1 particles and matter  P4 energy  C3 reactions  Year 8  C5 Formula and equations  C6 reactions  C7 particles and change  B5 digestion  Year 9  C10 more chemical reactions  C8 rates and equilibrium  **Year 10**  P6 molecules and matter  C5 chemical reactions  B3 enzymes  **Year 11**  C8 rates and equilibrium  Haber process |
| **Cross – curricular / Authentic Links** | | Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr 9 maths using %  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr 8-10 Maths Ratio and scale  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 Maths constructing in 2 and 3D  Y9 maths algebra  Yr 9 maths using %  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr 8-10 Maths Ratio and scale  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr 9 maths using %  Yr10 Maths interpreting data  Yr 11 Product design – section C/d  Yr 11 Maths – graphs | | Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr10 Maths interpreting data  Yr 11 Product design – section C/d  Yr 11 Maths – graphs | | Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Year 9 Food prep – raising agents  Y9 maths algebra  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Y8 maths representing data / working in the Cartesian plane  Y9 maths algebra  Yr10 Maths interpreting data  Yr 11 Maths – graphs |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** | Atom, Element, Compound, Isotope, Molecule, Mixture, Nucleus, Proton, Neutron, Electron | | Ionic bond, Covalent bond, Metallic bond, Ions, Electrons, Polymer, Monomer, Delocalised, Alloy, Group 0, Dot and Cross diagrams | | Conservation of mass, closed system, relative formula mass (Mr), balanced equation, uncertainty, limiting reactant | | Metal oxide, reactivity series, acid, base, alkali, neutralisation, carbonates, salt, soluble, insoluble, indicator, electrolysis, molten, solution | | Conservation of energy, exothermic reaction, endothermic reaction | | Concentration, rate of reaction, collision theory, activation energy, catalysts |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) |
| **On going** | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call |
| **End** | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review |
| **Assessment** | **Summative**  **Assessment** | | 1. C1 QMA (Y9 TOPICS) – in first 2 weeks of term | | 1. (TCAT QMA1) | | 1. C1 – C3 QMA | |  | | 1. C4C5 QMA | | 1. Y10 Mock June  (TCAT QMA2) |
| **Possible misconceptions** | |  | |  | |  | |  | |  | |  |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Safety and risk awareness (Practical work)  Medicine | | Safety and risk awareness (Practical work)  nanoparticles | | Safety and risk awareness (Practical work)  Extraction of metals/ environement | | Safety and risk awareness (Practical work)  Electrolysis – reducing raw materials use | | Safety and risk awareness (Practical work)  Fuel cells | | Safety and risk awareness (Practical work)  Catalysts and their uses |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances, energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Enrichment** | |  |  | | **GCSE Live** | |  | |  | |  | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Chemistry – Year 11 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | **C6 The Rate and Extent of Chemical Change**  **C7 Organic Chemistry** | | **C7 Organic Chemistry**  **C8 Chemical Analysis** | | **C8 Chemical Analysis**  **C9 Chemistry of the Atmosphere** | | **C9 Chemistry of the Atmosphere**  **C10 Using Resources** | | **EXAMS** | | **EXAMS** |
| **Key Knowledge & Concepts** | | Reversible reactions  Equilibrium  Effect of changing conditions on equilibrium  Effect of changing concentration  C7:  Crude Oil, hydrocarbons and alkanes  Fractional distillation and petrochemicals  Properties of hydrocarbons  Cracking and alkenes  Alkenes and their reactions | | C7:  Alcohols  Carboxylic Acids  Addition and Condensation Polymerisation  Amino Acids  DNA (Chem only)  C8:  Pure substances  Formulations  **Required Practical 6 - Chromatography**  Identification of Common Gases | | C8:  Flame Tests  Metal Hydroxide Test  Carbonate, Halide and Sulfate Tests  **Required Practical 7 – Use of Chemical Test to Identify Ions**  Instrumental Methods  Flame Emission Spectroscopy (Chem only)  C9:  Proportions of different gases in the the atmosphere  Earth’s Early Atmosphere  How oxygen increased  How carbon dioxide decreased  Greenhouse Gases  Contribution of human activities  Global Climate Change  Carbon Footprint  Atmospheric Pollutants from Fuels  Properties and effects of atmospheric pollutants | | C10:  Using the Earth’s resources and sustainable development  Potable water  **Required Practical 8 – Analysis and purification of water samples**  Waste water treatment  Alternative methods of extracting metals  Life Cycle Assessment  Recycling  Corrosion and its prevention  Alloys  Ceramics, polymers and composites  Haber Process and use of NPK fertilisers (Chem only) | |  | |  |
| **Clarity around Sequencing** |  | | Working scientifically and Maths skills embedded across units and schemes of learning | | | | | | | | | | |
| **Main links across the curriculum** | | Y7  Y7 C3: Reactions  Y7 C1: Particles & Matter  Y8  Y8 C6: Reactions  Y8 B5: Food & Digestion  Y8 C7: Particles & Change  Y9  Y9 C10: More Chemical Reactions  Y9 C11: Metal Reactions  Y9 C9: Environmental Chemistry  Y10  Y10 C5: Chemical Reactions  Y10 P6: Molecules & Matter  Y10 C4: Quantitative Chemistry  Y11  Y11 C15: Using our resources | | Y7  Y7 C2: Separating Techniques  Y7 C4: Acids & Alkalis  Y7 C3: Reactions  Y8  Y8 C5: Formulae & Equations  Y8 C6: Reactions  Y8 C5: Formulae & Equations  Y10  Y10 C3: Bonding & Structure  Y7 C3: Reactions  Y9 B9: Genetics  Y10 B3: Organisation and the digestive system | | Y7  Y7 C3 Reactions;  Y8  Y8 C9 Environmental chemistry; Y8 B7 On the farm;  Y9  Y9 C11 Metal reactions;  Y11  Y11 B15, 16 17 Ecology | | Y7  Y7 C2 Separating techniques; Y7 C3 Reactions;  Y8  Y8 C7 Particles and Change ; Y8 C8 Chemical resources ; Y8 C9 Environmental chemistry ;  Y9  Y9 C11 Metal reactions  Y10  Y10 P123 Energy and Resources  Y11  Y11 B15 16 17 Ecology  Y10 P123 Energy and Resources | |  | |  |
| **Cross – curricular / Authentic Links** | | Y8  Maths  Spr 2  -Standard form  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1)  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Directed number & fractional thinking  Y7 Developing number sense  Y8 Representations  Y8 Algebraic techniques  Y8 Developing number  Y8 Reasoning with data  Y9 Reasoning with algebra  Y9 Reasoning with number  Y9 Reasoning with proportion  Y11 Graphs  Y11 Algebra  Y11 Reasoning | | Y8  Maths  Spr 2  -Standard form  **Graphics:**  Y10: Summer 2  **Product Design:**  Y10: Angle-poise lamp  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | | Y7  **Maths**  SPR1  -Addition, Subtraction Multiplication and Division  AUT1  -Finding the mean, median, range, mode  -Place value and ordering  Y8  **Maths**  AUT 1  -Draw and interpret scale  AUT 2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  Y10  English  Spr 2 Non-fiction comprehension  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | | Y7  **Maths**  AUT1  -Place value and ordering  Y8  **Maths**  AUT2  -Plot and interpret straight line graphs  -Interpret scatter graphs  -Draw line of best fits  Spr 2  -Standard form  Y9  **Maths**  Aut 1  Interpret straight line graphs  Aut 2  Work out area/volume  Spr 1  Revisit percentages  Sum 1  Solving ratio and proportion problems  Sum 2  Probability  Y10  English  Spr 2 Non-fiction comprehension  Y10  English  Spr 2 Non-fiction comprehension  Maths  Aut 1  Higher content Area and Volume  Spr1  Working with circles  Spr 2  Percentages/ % change  Sum1  Collecting, representing and interpreting data  Sum2  Calculate with numbers in standard form  Y11  Maths  Aut 1  Exponential graphs  Aut 2  Change subject of formula ( also Y9 Aut 1) | |  | |  |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** | Reaction rate; collision theory; activation energy; temperature; concentration; pressure; catalysts; reversible reactions; endothermic; exothermic; enthalpy; dynamic equilibrium; Le Chatelier’s Principle; hydrocarbons; fractions; distillation; alkanes; saturated; fractional distillation; combustion; oxidised; cracking; thermal decomposition; alkene; double bond; functional group; homologous series; | | Alcohol; carboxylic acid; ester; combustion; oxidation; catalyst; polymer; monomer; addition polymerisation; condensation polymerisation; polysaccharides; DNA, nucleotides | |  | |  | |  | |  |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) |
| **On going** | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call | | Mini Whiteboard use  Cold call |
| **End** | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review |
| **Assessment** | **Summative**  **Assessment** | | C6 QMA | | 1. Y11Mock December (TCAT QMA 3) | |  | | 1. Y11 Mock Easter  ( TCAT QMA 4) | | **GCSE Formal exams** | |  |
| **Possible misconceptions** | |  | |  | |  | |  | |  | |  |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Crude oil, hydrocarbons, petrochemicals | | Alcohol, esters, polymers | |  | |  | |  | |  |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances, energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Enrichment** | |  |  | |  | |  | |  | |  | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Physics – Year 10 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | P6 Particle model of matter  P7 Atomic Structure | | P1/2/3 Energy and Energy Resources | | P1/2/3 energy and energy Resources (cont’d) | | P4/5 Electricity | | P4/5 Electricity concluded. | | P8/9 Forces 1 |
| **Key Knowledge & Concepts** | | 4.4 Atomic Structure  Structure of the Atom.  Mass no, atomic no, isotopes.  Development of the atomic model.  Radioactive decay and nuclear radiation.  Nuclear equations.  Half-lives, random nature of decay.  Radioactive contamination.  (Seps only –  Background radiation.  Different half-lives.  Uses of nuclear radiation.  Nuclear Fission.  Nuclear Fusion.) | | 4.1 Energy  Energy stores and systems.  Changes in Energy.  Energy changes in systems.  RP1 -Specific heat capacity.  Power. | | 4.1 Energy  (Seps only – RP2 -investigating thermal insulators)  Energy transfers in a system.  Efficiency.  National and global energy resources. | | 4.2 Electricity  CURRENT ELECTRICITY:  Standard circuit symbols and diagrams.  Electrical charge and current.  Current, resistance and pd.  RP3a – resistance of a wire  RP3b – resistors in series and parallel.  IV characteristics of components. | | 4.2 Electricity  RP4 – I/V characteristics.  Series and Parallel circuits.  DOMESTIC ELECTRICITY:  Dc and ac.  Mains electricity.  Electrical Power.  Energy transfer in appliances.  The National Grid.  (Seps only) Static Electricity.  (Seps only) Electric Fields. | | 4.5 Forces.  Scalars and Vectors  Contact and non-contact forces.  Resultant forces on free body diagrams. Newton I, II, III laws. Distance vs displacement, speed vs velocity. Motion graphs. Acceleration equations 1 and 2. |
| **Clarity around Sequencing** | **Main links across the curriculum** | | **Year 7**  C1 particles & matter  C3 reactions  P1 circuits  P4 energy  **Year 8**  P8 magnets  P9 heat transfers  C5 formula and equations  C7 particles & change  **Year 9**  **Year 10**  P1 energy  C1 Atomic structure  **Year 11**  P10/11 forces  P16 Space | | **Year 7**  C1 particles & matter  C3 reactions  P1 circuits  P4 energy  B1 cells  B3 ecology  P2 solar system  **Year 8**  P5 Light  B5 food & digestion  C5 formula and equations  B6 breathing & respiration  B7 on the farm  P7 sound  P8 magnets  P9 heat transfers  C9 environmental chemistry  C8 chemical resources  **Year 9**  P10 energy & electricity  P11 gravity and motion  B10 fit and healthy  **Year 10**  B8 Photosynthesis  B9 Respiration  B3 Digestion  P4/5 electricity  P6 molecules and matter  P7 radioactivity  P8/9 forces  **Year 11**  B16/17 ecology  C7 energy changes  C15 using resources  P10/11 forces  P12 /13/14 waves  P15 electromagnets  P16 space | | **Year 7**  C1 particles & matter  C3 reactions  P1 circuits  P4 energy  B1 cells  B3 ecology  P2 solar system  **Year 8**  P5 Light  B5 food & digestion  C5 formula and equations  B6 breathing & respiration  B7 on the farm  P7 sound  P8 magnets  P9 heat transfers  C9 environmental chemistry  C8 chemical resources  **Year 9**  P10 energy & electricity  P11 gravity and motion  B10 fit and healthy  **Year 10**  B8 Photosynthesis  B9 Respiration  B3 Digestion  P4/5 electricity  P6 molecules and matter  P7 radioactivity  P8/9 forces  **Year 11**  B16/17 ecology  C7 energy changes  C15 using resources  P10/11 forces  P12 /13/14 waves  P15 electromagnets  P16 space | | **Year 7**  P1 Circuits and electricity  P4 energy  **Year 8**  C8 chemical resources  P8 magnets  **Year 9**  P10 energy & electricity  **Year 10**  P1/2/3 Energy  C5 electrolysis  **Year 11**  P15 electromagnets | | **Year 7**  P1 Circuits and electricity  P4 energy  **Year 8**  C8 chemical resources  P8 magnets  **Year 9**  P10 energy & electricity  **Year 10**  P1/2/3 Energy  C5 electrolysis  **Year 11**  P15 electromagnets | | **Year 7**  P3 forces  P4 energy  P2 solar system  **Year 8**  P6 Pressure & levers  P8 magnets  **Year 9**  P9 gravity and motion  **Year 10**  P6 Molecules & Matter  P1/2/3 Forces  **Year 11**  P10/11 forces  P15 electromagnets  P16 space |
| **Cross – curricular / Authentic Links** | | Yrs 7 - 11 maths algebra  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr 7 sets and probability  Yr 8-10 Maths Ratio and scale  Yr 9 maths solving ratio and proportion problems  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 8 probability  Yr 9 English Dystopia  Yr 9 maths using %  Yr10 maths probablity  Yr10 Maths interpreting data  # Yr 11 Maths – graphs | | Yrs 7 - 11 maths algebra  Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 maths using %  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Yrs 7 - 11 maths algebra  Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr 7 tech – introduction project  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 maths using %  Yr10 Maths interpreting data  Yr 11 Maths – graphs | | Yrs 7 - 11 maths algebra  Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 maths using %  Yr10 Maths interpreting data  Yr10 product design – angle poise lamp  Yr 11 Maths – graphs | | Yrs 7 - 11 maths algebra  Yr 7 maths fractions, decimals and %  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 maths using %  Yr10 Maths interpreting data  Yr10 product design – angle poise lamp  Yr 11 Maths – graphs | | Yrs 7 - 11 maths algebra  Yr 7 Maths multiplication and division  Yr7 maths Construction and measuring  Yr8 maths standard index form  Y8 maths representing data / working in the Cartesian plane  Yr 9 maths using %  YR 9 maths Pythagoras theorem  Yr9 maths rates  Yr10 Maths interpreting data  Yr 11 Maths – graphs |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** | Atom, isotopes, decay, radiation, irradiation, contamination, random | | Energy, stores, pathways, conservation, closed system, proportional | | Efficiency, renewable, non-renewable, advantages, disadvantages, carbon dioxide | | Electron, current, charge, potential difference, resistance, series, parallel, proportional | | Electron, current, charge, potential difference, resistance, series, parallel, proportional, power, energy, positive, negative | | Scalar, vector, contact, not contact, resultant, distance, displacement, speed, velocity, acceleration |
| **Memory & Cognition** | **Retrieval Practice: Focus a*nd Activity*** | **Start** | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) | | Roulette use each lesson( apart from practical lessons) |
| **On going** | Cold call, use of whiteboards | |  | |  | |  | |  | |  |
| **End** | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review |
| **Assessment** | **Summative**  **Assessment** | | 1. Particles topic QMA, in first 2 weeks of term 2. (TCAT QMA1) | | 1. Atomic Structure QMA | |  | | 4. Energy QMA | | Electricity QMA  1. Y10 Mock June  (TCAT QMA2) | |  |
| **Possible misconceptions** | |  | |  | |  | |  | |  | |  |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Safety and risk awareness (Practical work)  Radioactive contamination | | Safety and risk awareness (Practical work) | | Safety and risk awareness (Practical work)  National global and energy resources | | Safety and risk awareness (Practical work) | | Safety and risk awareness (Practical work)  Domestic electricity | | Safety and risk awareness (Practical work) |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances , energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
|  | **Enrichment** | |  |  | |  | |  | |  | |  | |

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| **Bridgewater High Key Stage 4 Curriculum Map** |
| Physics – Year 11 |



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| **Intent:6 key principles** | **Implementation** | | **Autumn Term 1** | | **Autumn Term 2** | | **Spring Term 1** | | **Spring Term 2** | | **Summer Term 1** | | **Summer Term 2** |
| **Clarity around knowledge** | **Theme/Topic** | | **P8/9 Forces 1 (Concluded)**  **P10/11 Forces 2** | | **P10/11 Forces 2 (Concluded)**  **P12/13/14 Waves and Light** | | **P12/13/14 Waves and Light (Concluded)** | | **P15 Electromagnetism**  **P16 Space** | | ￼ | | **EXAMS** |
| **Key Knowledge & Concepts** | | Forces 2 -  Inertia. Terminal velocity. Stopping distances and reaction times. Momentum.  Impact forces. Forces and elasticity. RP6 – Force vs extension for a spring.  Forces 2 (Separates only) - Pressure in fluids. Atmospheric pressure. | | Waves and Light -  P12 - Transverse vs longitudinal. Wave properties. Wavespeed eqn, frequency/period eqn.  RP8 – measuring the speed of a wave.  Refraction. Sound waves. Ultrasound. Seismic waves.  P13 – EM wave types. EM waves vs materials. Production and absorption of EM waves. | | RP 10 – investigating absorption/emission of EM waves by surfaces.  Black bodies. Uses of EM waves. Radiation dose.  P14 (Seps only)–  Reflection. RP9 – refraction of light. Light and colour. Lenses. | | P15 -  Magnetic poles. Magnetic fields. Electromagnetism. Motor effect, Fleming’s LHR. Electric motors, loudspeakers. Induced PD. Generators, dynamos, microphones, transformers.  P16 (Seps only)- The solar system. life cycle of a star. Orbits and satellites. Red shift. | |  | |  |
| **Clarity around Sequencing** | **Main links across the curriculum** | | Y7 P3: Forces  Y9 P11: Gravity & Motion  Y10 P1,2,3: Energy & Energy Resources  Y8 P6: Pressure & Levers | | Y8 P5: Light  Y8 P7: Sound  Y8 P8: Heat transfers  Y9 P11: Gravity & Motion  Y10 P7: Radioactivity | | Y8 P5: Light  Y8 P8: Heating & Cooling  Y10 P7: Radioactivity | | Y8 P8: Magnets  Y7 P1: Circuits & Electricity  Y9 P10: Energy & Electricity  Y10 P4,5: Electricity  Y10 P1,2,3: Energy & Energy Resources  Y8 P7: Sound  Y7 P2: Solar Systems | |  | |  |
| **Cross – curricular / Authentic Links** | | **Maths:**  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Directed number & fractional thinking  Y7 Developing number sense  Y8 Representations  Y8 Algebraic techniques  Y8 Developing number  Y8 Reasoning with data  Y9 Reasoning with algebra  Y9 Reasoning with number  Y9 Reasoning with proportion  Y10 Geometry  Y11 Graphs  Y11 Algebra  Y11 Reasoning  **Product Design:**  Y10: Angle-poise lamp | | **Maths:**  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Directed number & fractional thinking  Y7 Developing number sense  Y8 Representations  Y8 Algebraic techniques  Y8 Developing number  Y8 Reasoning with data  Y9 Reasoning with number  Y9 Reasoning with proportion  Y11 Algebra  Y11 Reasoning  **Geography**  Y9 Volcanoes  Y9 Earthquakes | | **Maths:**  Y7 Place value & proportion  Y7 Application of number  Y7 Directed number & fractional thinking | | **Maths:**  Y7 Algebraic thinking  Y7 Place value & proportion  Y7 Application of number  Y7 Directed number & fractional thinking  Y7 Developing number sense  Y8 Algebraic techniques  Y8 Developing number  Y9 Reasoning with number  Y9 Reasoning with proportion  Y10 Proportions & proportional change  Y11 Algebra  **Technology**  Y8 Mechanisms | |  | |  |
| **Vocabulary / Literacy** | **Literacy** | **Reading** | **Reading**: Booklet reading. Begin most lessons with reading through booklet paragraphs. Time spent on explanation of Tier 2 and 3 words. Etymology of words discussed where time allows. Teacher- led and pupil-led practice.  **Speaking**: Decoding words should be common practice in many science lessons; again, use of the Frayer model may be seen, or simply the pupils taught the root word and then meaning of scientific term | | | | | | | | | | |
| **Ext. Writing** | **Writing**: Strategies to encourage extended writing that force links to be made with varying ideas are promoted in the use of ‘Because, But, So’ and ‘Frayer model’ word use. | | | | | | | | | | |
| **Key**  **Vocabulary** |  | |  | |  | |  | |  | |  |
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| **On going** | Cold call, use of whiteboards | | Cold call, use of whiteboards | | Cold call, use of whiteboards | | Cold call, use of whiteboards | | Cold call, use of whiteboards | | Cold call, use of whiteboards |
| **End** | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review | | Practice question review |
| **Assessment** | **Summative**  **Assessment** | | Forces 1 QMA | | Forces 2 QMA  November mock exams  (TCAT QMA3) | | Waves and Light QMA | | Electromagnetism QMA  Space QMA | | GCSE Exams | |  |
| **Possible misconceptions** | |  | |  | |  | |  | |  | |  |
|  | **Links to real world (Inc. SMSC / PD curricula)** | | Stopping distances & reaction times, Impact forces | | Seismic waves, production and absorption of EM waves, ultrasound | | Uses of EM waves, radiation dose, lenses | | Electromagnetism. Motor effect, Fleming’s LHR. Electric motors, loudspeakers. Induced PD. Generators, dynamos, microphones, transformers, the Solar System, orbits & satellites | |  | |  |
| **Aspiring, inspiring and Real** |  | | **We promote spiritual development, We promote moral development, We promote social development, We promote cultural development**  By demonstrating openness to the fact that some answers cannot be provided by Science. By creating opportunities for pupils to ask questions about how living things rely on and contribute to their environment. By encouraging pupils to consider the relationship between themselves, our planet and the universe and how it might have been formed.  By instilling desire for greater understanding of the world around us. By having an appreciation of development of life on earth through discussions around evolution and creationism. By offering pupils the chance to consider the wonder of the natural world and the inventions which have made the world a better place.  By considering that not all developments have been good because they have caused harm to the environment and to people. By encouraging pupils to speculate about how science can be used both for good and evil. Consideration of the implications of the use of embryos for cloning & stem cell research. By considering potentially contentious areas of scientific work e.g. animal testing.  By achieving Eco-School status. By using opportunities during Science lessons to explain how to keep other people safe and how they might protect a younger or vulnerable young person. By exploring the social dimension of scientific advances e.g. environmental concerns, medical advances ,energy processes. By exploring different social development such as relationships, attachment etc.  By teaching scientific literacy. By following schemes of learning that encourage practical teamwork and ‘job’ sharing to meet specific goals., By asking questions about the ways in which scientific discoveries from around the world have affected our lives. By asking questions about cultural bias within science. By discussing how ‘human development’ can impact upon ancient cultures and established habitats and ecosystems. | | | | | | | | | | |
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