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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-CellsPhysics 1- EnergyChemistry 2-Separating techniques | Physics 2- Electrical CircuitsBiology 2-ReproductionChemistry 3- Reactions | Biology 3- EcologyPhysics 3- Forces | Biology 4- ClassifiedChemistry 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 graphsWS1 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 experienceWS1 Can select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriateWS1 Can interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusionsProperties 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 energySimple 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 resistanceReproduction in humans: the structure and function reproductive systems, menstrual cycle gametes, fertilisation, gestation and birth, effect of maternal lifestyle on the foetus through the placentaChemical 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 chainsForces 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 hydrogenreactions 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 7C2: Sep techniquesB1 : CellsP2 circuitsYear 8C7 Particles and changeB5 food digestionYear 9C10 more chem reactionsYear 10B1 B2 : Cell structure and organisationP6 Molecules and matterP7 RadioactivityC1 AtomsYear 11C8 Rates and equilibrium | Year 7C1: ParticlesB2 reproductionYear 8B6 Breathing respirationB8 MicrobesP9 Heat transfersB5 food digestionYear 9B9 GeneticsB10 fit and healthyP10 Energy and ElectricityC10 more chem reactionsYear 10P123 EnergyB1 B2 : Cell structure and organisationB2 cell divisionB3 B4 OrganisationB567 Diseases and preventionB8 B9 RespirationB10 Human nervous systemC1 atomic structureC7 Energy changesP6 Molecules and matterP4 P5- electricityYear 11C12 chemical analysisB11 B12 Hormonal homeostasisB13 B14 B15 Reproduction Variation Genetics Evolution | Year 7C1: ParticlesB1 CellsC4 AcidsYear 8C5 FormulaeC6 Reactions contdC7 Particles and changeP8 MagnetsB8 MicrobesYear 9C10 more chem reactionsC11 Metal reactionsP10 Energy ElectricityB9 GeneticsYear 10B1 B2 : Cell structure and organisationP7 RadioactivityP123 EnergyP45 electricityC5 Chemical reactionsC6 electrolysisC7 energy changesYear 11P15 electromagnetsB13 ReproductionC12 chemical analysisC9 Crude oil and fuels | Year 7B4 classifiedP1 energyP4 Solar systemYear 8B7 On the FarmP6 pressureP8 MagnetsYear 9P11 Gravity motionP10 Energy electricityYear 10P6 Molecules and matterP123 EnergyYear 11B16/17/18 EcologyB14 B15 Variation EvolutionP8 9 10 11 ForcesP15 electromagnets | Year 7B3 EcologyC1 ParticlesC3 ReactionsYear 8B8 MicrobesB8 MicrobesC6 Reactions contdYear 9B9 GeneticsC10 more chem reactionsC11 Metal reactionsYear 10B1 B2 : Cell structure and organisationB5 diseasesC5 ReactionsC4 Quantitative chemistryYear 11B16/17/18 EcologyB14 B15 Variation EvolutionC13 Atmospheric Chemistry | Year 7P3 ForcesYear 8P6 pressureYear 9P11 Gravity motionP10 Energy electricityYear 10C4 Quantitative chemistryYear 11P16 spaceP8 9 10 11 Forces |
|  | **Cross – curricular / Authentic Links 2** | Y7 Food tech: Hygiene and Safety Autumn 1Y7 Maths: Lines and angles Summer 1Y8 Maths: Plotting and interpret graphs, representing data Autumn 2Y9 Food Tech : safety and Hazards Autumn 1 +2Y9 Maths Straight line graphs Autumn 1Y9 Maths interpreting graphs Summer 2Y10 Maths Collecting, representing and interpreting data Summer 1 | Y7 Maths: Multiplication & division Spring 1Y8 Tech units of measurement Autumn 1 + 2 | Y9 Food Tech : Raising agents Autumn 1 +2Y10 RS Sexual relationships autumn 2. | Y7 Maths: algebraic notation Autumn 1Y8 Tech units of measurement Autumn 1 + 2Y9 Geog characteristics of adaptations Summer 1Y9 Maths algebraic representation Summer 2Y10 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 throughoutMini-Whiteboards |
|  |  | **End** | Brain DumpsSay it again, Say it betterConcept 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** | WS1Types of graphs, scales on graphs, analysis vs evaluationParticlesParticle diagrams of liquids, pressure acting in all directions | CellsNucleus as brain/control centrePlant vs animal organellesEnergyDifferentiation between stores and pathways, pollution by carbon dioxideSeparating TechSolute/Solvent/solution,Melting vs dissolving, solutions evaporating (rather than water evaporating) | Electrical circuitsElectricity flowing as opposed to electrical current, how electrons move,ReproductionNuclei fusing at fertilisation, uterus muscles contract, placenta vs umbilical cord functionReactionsChemical/physical changes link to physical actions/must use chemicals | EcologyConsumer/producer, energy levels, pyramid numbers/biomassForcesDensity as heaviness, weight/mass, concept of reaction force | ClassifiedVariationAcidsNeutralisation only happens when exact amounts used, changes in pH during neutralisation,  | Solar systemAstronauts 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 ReproductionY7 Electrical circuitsY7 Reactions |  | Y7 ClassifiedY7 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 LightBiology 5 Food and DigestionChemistry 5 Formulae and equations | Physics 6 Pressure and LeversBiology 6 Breathing and RespirationChemistry 6 Reactions continued | Physics 7 Sound wavesBiology 7 On the farm | Chemistry 7 Particles and ChangePhysics 8 Magnets | Chemistry 8 Chemical resourcesBiology 8 Microbes and disease | Physics 9 Heat transfersChemistry 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 eyeContent 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-metalsthe properties of metals and non-metalsDifferences 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 movementMoment 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 sinkingThe 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 andthe 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 insulatorsThe 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 thinkingY7 Place value & proportionY7 Application of numberY7 Developing number senseY8 Algebraic techniquesFOOD TECH:Y7 Food for good healthY7 DairyY9 Diet and HealthPE:Y11 Health, fitness & wellbeing | MATHS:Y7 Algebraic thinkingY7 Place value & proportionY7 Application of numberY7 Developing number senseY8 Algebraic techniquesPE:Y10 Applied anatomy & physiology | GEOGRAPHY:Y10 Resource Management | GEOGRAPHY: Y7 OS Maps | FOOD TECH:Y7 Hygiene and safetyHISTORY: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 eyesStomach 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 GeneticsChemistry 10 More Chemical ReactionsPhysics 10 Energy and Electricity | Biology 10 Fit and HealthyChemistry 11 Metal ReactionsPhysics 11 Gravity and Motion | Y9 Science discipline mastery work:1. Maths in Science and Working Scientifically
2. **Cellular biology/ Atoms and particles / Particle model**
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| **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 changeComparing 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 microscopeEukaryotes and prokaryotes Cell differentiation and specializationMicroscopyChromosomes *Mitosis and the cell cycle* Stem cells Diffusion**Atomic structure and the periodic table**Atoms, elements and compoundsMixtures Scientific models of the atomRelative electrical charges of subatomic particles size and mass of atoms Electronic structure Relative atomic mass The periodic tableDevelopment of the periodic table **Particle model of matter** Density of materials Required practical - DensityChanges of state Internal energyTemperature changes in a system and specific heat capacity Required practical - Specific heat capacityChanges 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 MatterB1 CellsC2 Separating TechniquesP1 Circuits and ElectricityB2 ReproductionC3 ReactionsP3 ForcesB4 ClassificationP4 Energy**Year 8**P5 LightC5 Formulae and EquationsC6 ReactionsB7 On the FarmC7 Particles and changeP9 Heat Transfers | **Year 10**B1/B2 Cells and OrganisationB16/B17/B18 EcologyC1 Atomic StructureC2 Bonding and StructureC3 Quantitative ChemC4 Chemical ReactionsP1/P2/P3 Energy and Energy ResourcesP4/P5 Electricity**Year 11**B13 ReproductionB14/B15 Variation and Evolution | **Year 7**C1 Particles and MatterB1 CellsC2 Separating TechniquesC3 ReactionsP3 ForcesC4 Acids and Alkalis**Year 8**B5 Food and DigestionC5 Formulae and EquationsB6 Breathing and RespirationC6 ReactionsC7 Particles and ChangeC8 Chemical ResourcesB8 Microbes and Disease | **Year 10**B1 Cells and OrganisationB3 Organisation and Digestion SystemB4 Organising Animals and PlantsB6 Preventing and Treating DiseasesB7 Non communicable diseaseB9 RespirationC1 Periodic TableC2 Bonding and StructureC4 Chemical ReactionsP8/P9 Forces 1**Year 11**B10 Human Nervous SystemB11 Hormonal CoordinationB12 HomeostasisP8/P9 Forces 1 | **Year 7**Working ScientificallyC1 Particles and MatterB1 CellsC2 Separating TechniquesP3 ForcesP4 Energy**Year 8**C5 Formulae and EquationsC7 Particles and ChangeP9 Heat Transfers | **Year 10**B1/B2 Cells and OrganisationB3 Organisation and Digestive SystemB4 Organising Animals and PlantsB8/B9 Respiration and PhotosynthesisC1 Periodic TableC2 Bonding and StructureC3 Quantitative ChemC4 Chemical ChangesC5 Energy ChangesP7 RadioactivityP1/P2/P3 Energy and Energy Resources**Year 11**B10 Human nervous systemB13 ReproductionC6 Rates and EquilibriumP10/P11 Forces 2 |
| **Cross – curricular / Authentic Links** | **Year 7****Maths** AUT 1 – Use algebraic notationAUT 2 – Place value and proportionSPR 1 – Addition, Subtraction, Multiplication and DivisionSPR 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 ScaleAUT 2 – Working in the Cartesian Plane and Representing DataSPR 1 – Brackets and EquationsSPR 2 – Developing number | **Year 9****Maths** AUT 1 – Straight line graphsSUM 1 - Ratios**Food Tech**AUT 1 and 2 – understanding types of raising agentsUnderstanding chemical, biological and physical raising agentsUnderstanding 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 proportionSPR 1 – Addition, Subtraction, Multiplication and DivisionSPR 2 – Using a Calculator**Tech**AUT 1 – Understanding processing of metals**Year 8****Maths**AUT 1 – Ratio and ScaleAUT 2 – Working in the Cartesian Plane and Representing DataSPR 1 – Brackets and EquationsSPR 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 extractionTypes of shaping/forming  | **Year 10** **Maths**AUT 2 - Simultaneous EquationsSUM 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 AnalysisSPR 1 and 2 – Physical TrainingSUM 1 – Use of data**Year 11****Maths**AUT 1 – Gradients and linesAUT 1 – Speed, distance, time graphs and estimate the area under a curveAUT 2 – Changing the subject**PE**SPR 2 – Health, fitness and well-being | **Year 8****Maths**AUT 1 - Ratio and scaleSPR 1 – Brackets and equationsSPR 2 – Standard Index form and number senseSUM 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** | ConservationPotential DifferenceEnergyStateDisplacement Thermal decompositionCombustion | HeredityChromosomesGenesVariation | AccelerationGradientProperties AcidityReactivityEffervescenceNeutralisation | AntagonisticAddictionWithdrawalStaminaSuppleness | Specific heat capacitySpecific Latent HeatCollisionsAtomsElementsCompoundsSubatomicIsotopeElectronic Structure | MicroscopyOrganelleDiffusion |
| **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 Physics2. TCAT QMA 1 November  |  | 1.End of unit 2 tests- Biology, Chemistry and Physics2. 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 interchangedEnergy dissipating to surroundings rather than energy lossGases have mass (Conservation of Mass) Physical change incorrectly identified as chemical reactions | Clarity over continuous and discontinuous featuresDifferences 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 jointsNutrients within diets, e,g fat is not always bad | No temperature change during change of stateIdea 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 BreedingComparing Power Ratings |  | Skeleton and MusclesSmokingDrugsSpeed |  | MicroscopingStem CellsDensity |  |
| **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 TransportB2 Cell divisionB3 Organisation and the Digestive system | B4 Organising Animals and PlantsB5 Communicable Diseases | B6 Preventing and treating diseaseB7 Non-Communicable disease | B7 Non-Communicable diseaseB8 Photosynthesis | B9 RespirationB16 Adaptations, interdependence and competition  | B17 Organising and EcosystemB18 Biodiversity and Ecosystems |
| **Key Knowledge & Concepts** | 4.1 Cell BiologyChromosomes Mitosis and the cell cycle Stem cells DiffusionOsmosis **Required practical 2 - Osmosis**Active transport 4.2 OrganisationOrganizational 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 cellsB2 reproductionP4 energy**Year 8**B5 food and digestionB6 breathing and respiration**Year 9**B9 geneticsB10 fit and healthy**Year 10**B4 organising animals and plantsB8 photosynthesisB9 respirationP1/2/3 energyC6 rates of reaction**Year 11** B13 reproductionB14/15 Variation and evolution | **Year 7** B1 cells**Year 8**B8 microbes and diseaseB6 breathing and respirationC5 formula and equations**Year 9**B10 Fit and healthy**Year 10**B1/2 CellsB6 preventing and treating diseaseB7 non communicable disease | **Year 7**B1 cells**Year 8**B8 microbes and diseaseB5 food and digestionB6 breathing and respiration**Year 9** B10 fit and healthyB9 genetics**Year 10**P7 radioactivityB1/2 cellsB5 communicable disease | **Year 7**B1 cellsB3 ecologyP4 energy**Year 8**B8 Microbes and diseaseB5 food and digestionB6 breathing and respirationB7 on the farmC5 formula and equationsP5 lightC9 environmental chemistry**Year 9** B10 fit and healthyB9 geneticsC10 more chemical reactionsP10 energy & electricity**Year 10**P7 radioactivityB1/2 cellsB5 communicable diseaseP1/2/3 energyB9 respirationC4 chemical reactions**Year 11**B16/17/18 EcologyP12/13/14 Waves and light | **Year 7**B1 cellsB3 ecologyP4 energy**Year 8**B5 food and digestionB6 breathing and respirationC5 formula and equationsC9 environmental chemistry**Year 9** B10 fit and healthyB9 geneticsC10 more chemical reactionsP10 energy & electricity**Year 10**B1/2 cellsP1/2/3 energyC4 chemical reactionsB8 photosynthesis**Year 11**B17/18 Ecology | **Year 7**P4 energyB3 ecologyC4 acids and alkalis**Year 8**B7 on the farmC6 reactionsC8 chemical resourcesC9 environmental chemistryC7 particles and change**Year 9**P10 energy**Year 10**B16 EcologyP3 energyP9 photosynthesis**Year 11**C13 chemistry of the atmosphereC14 the earth's resourcesC15 using our resources |
| **Cross – curricular / Authentic Links** | Yr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr 7 sets and probabliityYr 8-10 Maths Ratio and scale Yr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 8 Maths probabilityYr 9 Maths constructing in 2 and 3DY9 maths algebraYr 9 maths using %Yr10 Food – Diet, nutrition and healthYr10 Maths interpreting dataYr 11 Maths – graphs | Food Prep yr 7 Hygiene safety / Food for good healthY8 maths representing data / working in the Cartesian planeY9 maths algebraYr 10 History - Medicine through timeYr10 Maths interpreting dataYR10 PE – applied anatomy & physiologyYr 11 Maths – graphs | Y8 maths representing dataY8 maths representing data / working in the Cartesian planeYear 9 food prep - diet and healthY9 maths algebraYr10 Food – Diet, nutrition and healthYr 10 History - Medicine through timeYr10 Maths interpreting dataYr 11 Maths – graphsYr 11 PE Health fitness and wellbeing | Y8 maths representing data / working in the Cartesian planeY9 maths algebraYr9 maths ratesYr10 Maths interpreting dataYr 11 Maths – graphs | Y8 maths representing data / working in the Cartesian planeY9 maths algebraYr10 Maths interpreting dataYR10 PE – applied anatomy & physiologyYr 11 Maths – graphsYr 11 Maths sample spaces and probablity | Yr 7 tech – introduction projectY8 maths representing data / working in the Cartesian planeYear 9 food prep - food and the environmentY9 maths algebraYr10 Maths interpreting dataYr 11 Geography – the living worldYr 11 Maths – graphsYr 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 useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold 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)VaccinationDevelopment of drugs | Safety and risk awareness (Practical work)Lifestyle / health / risk factors | Safety and risk awareness (Practical work) | Global warmingSafety 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 EcosystemsB10 The Human Nervous System | B11 Hormonal CoordinationB12 Homeostasis in action | B12 Homeostasis in actionB13 Reproduction | B14 Variation and EvolutionB15 Genetics and Evolution | EXAMS | EXAMS |
| **Key Knowledge & Concepts** | Impact of the environmental change BIO onlyBiodiversity Waste management Land use Deforestation Global warming Maintaining biodiversity Trophic levels BIO onlyPyramids of biomass BIO onlyTransfer of biomass BIO onlyFactors affecting food security BIO onlyFarming techniques BIO onlySustainable fisheries BIO onlyRole of biotechnology BIO only4.5 Homeostasis and responseImportance of homeostasis Structure and function of the nervous system**Required practical 7- Reaction time**The brain BIO onlyThe eye BIO only | Control of body temperature BIO onlyHuman endocrine system Control of blood glucose concentration Maintaining water and nitrogen balance in the body BIO onlyHormones in human reproduction ContraceptionThe use of hormones to treat infertility HT onlyNegative feedback HT onlyPlant hormones- control and coordination BIO only**Required practical 8 - Germination BIO only**Use of plant hormones | 4.6 Inheritance, variation and evolutionSexual and asexual reproduction Meiosis Advantages and disadvantages of sexual and asexual reproduction BIO onlyDNA and the genome DNA structure BIO onlyGenetic inheritance Inherited disorders Sex determination | VariationEvolution Selective breeding Genetic engineering Cloning BIO onlyTheory of evolution BIO onlySpeciation BIO onlyThe understanding of genetics BIO onlyEvidence for evolution FossilsExtinction Resistant bacteria Classification |  |  |
| **Clarity around Sequencing** | **Main links across the curriculum** | Y10Y10 B8 B9 Bioenergetics: Y9Y9 B10 Fit and Healthy- Nervous system; Y8Y8 B7 On the Farm; Y7Y7 B4 Classified; Y7 B3 Ecology | Y7Y7 B2 Reproduction;Y8 Y8 B7 On the Farm | Y7Y7 B1 Cells; Y7 B2 Reproduction;Y9Y9 B9 Genetics ; Y10Y10 B2 Cell divisionY10 B567 Disease | Y7Y7 B4 Classification; Y9Y9 B9 Genetics;  |  |  |
| **Cross – curricular / Authentic Links** | Y7**Maths**SPR1-Addition, Subtraction Multiplication and Divison-Area of shapesAUT1-Finding the mean, median, range, mode-Place value and orderingY8**Maths**AUT 1-Draw and interpret scaleAUT 2-Plot and interpret straight line graphs-Interpret scatter graphs-Draw line of best fitsSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2Probability**Food tech**Spr1Sustainability- How food can affect the environmentY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formGeogSpr 2Resource management Food water and energy issuesY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1) | Y7**Maths**AUT1-Place value and orderingY8**Maths**AUT2-Plot and interpret straight line graphs-Interpret scatter graphs-Draw line of best fitsSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2ProbabilityY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1) | Y7**Maths**AUT1-Place value and orderingSUM2-ProbablityY8**Maths**AUT2-Plot and interpret straight line graphs-Interpret scatter graphs-Draw line of best fitsSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2ProbabilityY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1) | Y7**Maths**AUT1-Place value and orderingSUM2-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 fitsAUT 2-Discrete and continuous dataSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2ProbabilityY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 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** | EcosystemOrganismBioticAbioticTransectExtremophileInterdependence | HomeostasisCerebral cortexDialysis NeuroneCerebellumVasodilationVasoconstriction | AsexualMeiosisMitosisGenomeAlleleHomozygousHeterozygous | GenotypePhenotypePolydactylyEvolutionMonohybridEvolutionSpeciationExtinction |  |  |
| **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 useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold 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 onlyBiodiversity Waste management Land use Deforestation Global warming Maintaining biodiversity Factors affecting food security BIO onlyFarming techniques BIO onlySustainable fisheries BIO onlyRole of biotechnology BIO only | **B11 Hormonal Coordination****B12 Homeostasis in action**Control of blood glucose concentration Hormones in human reproduction ContraceptionThe use of hormones to treat infertility Use of plant hormones | B12 Homeostasis in actionB13 ReproductionDNA and the genome Genetic inheritance Inherited disorders Sex determination | B14 Variation and EvolutionB15 Genetics and EvolutionSelective breeding Genetic engineering Cloning BIO onlyTheory of evolution BIO onlyEvidence 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-metalsGroup 0Group 1Group 7Properties of Transition Metals (Chem only)C2:Chemical BondsIonic BondingIonic CompoundsCovalent BondingMetallic BondingProperties of ionic compoundsProperties of small moleculesPolymersGiant Covalent StructuresProperties of metals and alloysMetals as conductors | C2:The three states of matterState symbolsStructure and bonding of carbonSizes of particles and their properties Uses of nanoparticles(Chem only)C3:Conservation of mass and balanced chemical equationsRelative formula massMass changes when a reactant or product is a gasChemical measurementsMolesAmounts of substances in equationsUsing moles to balance equationsLimiting reactantsConcentration of solutionsPercentage YieldAtom EconomyUsing concentrations of solutions in mol/dm3 Use of amount of substance in relation to volumes of gases (Chem only) | C4: Reactivity of metals – metal oxidesReactivity seriesExtraction of metals and reductionOxidation and reduction (electrons)Reactions of acids with metalsNeutralisation of acids and salt production**Required Practical 1 – Soluble Salts**pH and neutralisationStrong and weak acids**C4: Required Practical 3 - Titrations (Chem only)** | C4:Process of electrolysisElectrolysis of molten ionic compoundsUsing electrolysis to extract metals**Required Practical 3 - Electrolysis of aqueous solutions**Half equationsC5: Endothermic and exothermic reactions**Required Practical 4 – Investigating the variables that affect temperature change** | C5: Reaction ProfilesEnergy change of reactionsCells and batteriesFuel Cells (Chem only)C6:Calculating rates of reactionsFactors 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 energyCatalysts |
|  |  | 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 ForcesP4 energy**Year 8**C5 formula & equationsC6 reactions**Year 9**P10 energy & ElectricityC11 Metal reactionsC10 More chemical reactions**Year 10**C5 Chemical ReactionsC3 Quantitative ChemC6 electrolysisP7 RadioactivityP4 Electric circuitsP8 Forces**Year 11**C7 Energy ChangeC8 Rates & equilibriumP16 space | **Year 7**C1 Particles & matterC3 reactions**Year 8**C5 formula and equationsC6 reactionsC7 Particles and changeB6 Breathing and respiration**Year 9**C10 More chemical reactionsC11 Metal reactions**Year 10** C1 Atomic Structure and the Periodic TableC2 Bonding and StructureC6 electrolysisP6 Molecules & matter**Year 11**C7 Energy changesC9/10/11 Organic Chemistry | **Year 7**C4 acids and alkalisC3 reactions**Year 8**C5 formula and equationsC6 reactionsC7 Particles and change**Year 9**C10 More chemical reactionsC11 Metal reactions**Year 10** C1 Atomic Structure and the Periodic TableC2 Bonding and StructureC5 electrolysisP6 Molecules & matter**Year 11**C7 Energy changesC9/10/11 Organic Chemistry | **Year 7**P1 Circuits & ElectricityP4 energyC3 reactions**Year 8**C5 formula & equationsC6 reactionsC8 chemical resources**Year 9**P10 energy & electricityC10 more chemical reactionsC11 Metal reactions**Year 10**C1 Atomic Structure and the Periodic TableC2 Bonding and StructureC5 electrolysisP4 electricity**Year 11**C8 rates and equilibrium | **Year 7**P1 circuits & electricityP4 energyC3 reactions**Year 8**C5 Formula and equationsC6 reactionsC7 particles and change**Year 9**C10 more chemical reactionsC8 rates and equilibriumYear 10 C5 Chemical reactionsP1 EnergyP4 ElectricityB8 photosynthesisYear 11C8 Rates and equilibrium | Year **7**C1 particles and matterP4 energyC3 reactionsYear 8C5 Formula and equationsC6 reactionsC7 particles and changeB5 digestionYear 9C10 more chemical reactionsC8 rates and equilibrium**Year 10**P6 molecules and matterC5 chemical reactionsB3 enzymes**Year 11**C8 rates and equilibriumHaber process |
| **Cross – curricular / Authentic Links** | Yr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionY8 maths representing data / working in the Cartesian planeY9 maths algebraYr 9 maths using %Yr10 Maths interpreting dataYr 11 Maths – graphs | Yr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr 8-10 Maths Ratio and scale Yr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 9 Maths constructing in 2 and 3DY9 maths algebraYr 9 maths using %Yr10 Maths interpreting dataYr 11 Maths – graphs | Yr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr 8-10 Maths Ratio and scale Yr8 maths standard index formY8 maths representing data / working in the Cartesian planeY9 maths algebraYr 9 maths using %Yr10 Maths interpreting dataYr 11 Product design – section C/dYr 11 Maths – graphs | Yr8 maths standard index formY8 maths representing data / working in the Cartesian planeY9 maths algebraYr10 Maths interpreting dataYr 11 Product design – section C/dYr 11 Maths – graphs | Yr8 maths standard index formY8 maths representing data / working in the Cartesian planeYear 9 Food prep – raising agentsY9 maths algebraYr10 Maths interpreting dataYr 11 Maths – graphs | Y8 maths representing data / working in the Cartesian planeY9 maths algebraYr10 Maths interpreting dataYr 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 useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold 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 reactionsEquilibriumEffect of changing conditions on equilibriumEffect of changing concentrationC7:Crude Oil, hydrocarbons and alkanesFractional distillation and petrochemicalsProperties of hydrocarbonsCracking and alkenesAlkenes and their reactions | C7: AlcoholsCarboxylic AcidsAddition and Condensation PolymerisationAmino AcidsDNA (Chem only)C8:Pure substances Formulations**Required Practical 6 - Chromatography**Identification of Common Gases | C8:Flame TestsMetal Hydroxide TestCarbonate, Halide and Sulfate Tests**Required Practical 7 – Use of Chemical Test to Identify Ions**Instrumental MethodsFlame Emission Spectroscopy (Chem only)C9:Proportions of different gases in the the atmosphereEarth’s Early AtmosphereHow oxygen increasedHow carbon dioxide decreasedGreenhouse GasesContribution of human activitiesGlobal Climate ChangeCarbon FootprintAtmospheric Pollutants from FuelsProperties and effects of atmospheric pollutants | C10: Using the Earth’s resources and sustainable developmentPotable water**Required Practical 8 – Analysis and purification of water samples**Waste water treatmentAlternative methods of extracting metalsLife Cycle AssessmentRecyclingCorrosion and its preventionAlloysCeramics, polymers and compositesHaber 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** | Y7Y7 C3: ReactionsY7 C1: Particles & MatterY8Y8 C6: ReactionsY8 B5: Food & DigestionY8 C7: Particles & ChangeY9Y9 C10: More Chemical ReactionsY9 C11: Metal ReactionsY9 C9: Environmental ChemistryY10Y10 C5: Chemical ReactionsY10 P6: Molecules & MatterY10 C4: Quantitative ChemistryY11Y11 C15: Using our resources | Y7Y7 C2: Separating TechniquesY7 C4: Acids & AlkalisY7 C3: ReactionsY8Y8 C5: Formulae & EquationsY8 C6: ReactionsY8 C5: Formulae & EquationsY10Y10 C3: Bonding & StructureY7 C3: ReactionsY9 B9: GeneticsY10 B3: Organisation and the digestive system | Y7Y7 C3 Reactions; Y8Y8 C9 Environmental chemistry; Y8 B7 On the farm; Y9Y9 C11 Metal reactions; Y11Y11 B15, 16 17 Ecology | Y7Y7 C2 Separating techniques; Y7 C3 Reactions; Y8Y8 C7 Particles and Change ; Y8 C8 Chemical resources ; Y8 C9 Environmental chemistry ;Y9 Y9 C11 Metal reactionsY10Y10 P123 Energy and ResourcesY11Y11 B15 16 17 EcologyY10 P123 Energy and Resources |  |  |
| **Cross – curricular / Authentic Links** | Y8MathsSpr 2-Standard formY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1)Y7 Algebraic thinkingY7 Place value & proportionY7 Application of numberY7 Directed number & fractional thinkingY7 Developing number senseY8 RepresentationsY8 Algebraic techniquesY8 Developing numberY8 Reasoning with dataY9 Reasoning with algebraY9 Reasoning with numberY9 Reasoning with proportionY11 GraphsY11 AlgebraY11 Reasoning | Y8MathsSpr 2-Standard form**Graphics:**Y10: Summer 2**Product Design:**Y10: Angle-poise lampY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1) | Y7**Maths**SPR1-Addition, Subtraction Multiplication and DivisionAUT1-Finding the mean, median, range, mode-Place value and orderingY8**Maths**AUT 1-Draw and interpret scaleAUT 2-Plot and interpret straight line graphs-Interpret scatter graphs-Draw line of best fitsSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2ProbabilityY10EnglishSpr 2 Non-fiction comprehensionY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 2 Change subject of formula ( also Y9 Aut 1) | Y7**Maths**AUT1-Place value and orderingY8**Maths**AUT2-Plot and interpret straight line graphs-Interpret scatter graphs-Draw line of best fitsSpr 2-Standard formY9**Maths**Aut 1Interpret straight line graphsAut 2 Work out area/volumeSpr 1 Revisit percentagesSum 1 Solving ratio and proportion problemsSum 2ProbabilityY10EnglishSpr 2 Non-fiction comprehensionY10EnglishSpr 2 Non-fiction comprehensionMathsAut 1Higher content Area and VolumeSpr1 Working with circlesSpr 2Percentages/ % changeSum1 Collecting, representing and interpreting dataSum2Calculate with numbers in standard formY11MathsAut 1 Exponential graphsAut 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 useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold call | Mini Whiteboard useCold 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 matterP7 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 StructureStructure 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 EnergyEnergy 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 ElectricityCURRENT ELECTRICITY:Standard circuit symbols and diagrams.Electrical charge and current.Current, resistance and pd.RP3a – resistance of a wireRP3b – resistors in series and parallel.IV characteristics of components. | 4.2 ElectricityRP4 – 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 VectorsContact 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 & matterC3 reactionsP1 circuitsP4 energy**Year 8**P8 magnetsP9 heat transfersC5 formula and equationsC7 particles & change**Year 9****Year 10**P1 energyC1 Atomic structure**Year 11**P10/11 forcesP16 Space | **Year 7**C1 particles & matterC3 reactionsP1 circuitsP4 energyB1 cellsB3 ecologyP2 solar system**Year 8**P5 LightB5 food & digestionC5 formula and equationsB6 breathing & respirationB7 on the farmP7 soundP8 magnetsP9 heat transfersC9 environmental chemistryC8 chemical resources**Year 9** P10 energy & electricityP11 gravity and motionB10 fit and healthy**Year 10**B8 PhotosynthesisB9 RespirationB3 DigestionP4/5 electricityP6 molecules and matterP7 radioactivityP8/9 forces**Year 11**B16/17 ecologyC7 energy changesC15 using resourcesP10/11 forcesP12 /13/14 wavesP15 electromagnetsP16 space | **Year 7**C1 particles & matterC3 reactionsP1 circuitsP4 energyB1 cellsB3 ecologyP2 solar system**Year 8**P5 LightB5 food & digestionC5 formula and equationsB6 breathing & respirationB7 on the farmP7 soundP8 magnetsP9 heat transfersC9 environmental chemistryC8 chemical resources**Year 9** P10 energy & electricityP11 gravity and motionB10 fit and healthy**Year 10**B8 PhotosynthesisB9 RespirationB3 DigestionP4/5 electricityP6 molecules and matterP7 radioactivityP8/9 forces**Year 11**B16/17 ecologyC7 energy changesC15 using resourcesP10/11 forcesP12 /13/14 wavesP15 electromagnetsP16 space | **Year 7**P1 Circuits and electricityP4 energy**Year 8**C8 chemical resourcesP8 magnets**Year 9**P10 energy & electricity**Year 10**P1/2/3 EnergyC5 electrolysis**Year 11**P15 electromagnets | **Year 7**P1 Circuits and electricityP4 energy**Year 8**C8 chemical resourcesP8 magnets**Year 9**P10 energy & electricity**Year 10**P1/2/3 EnergyC5 electrolysis**Year 11**P15 electromagnets | **Year 7**P3 forcesP4 energyP2 solar system**Year 8**P6 Pressure & leversP8 magnets**Year 9**P9 gravity and motion**Year 10**P6 Molecules & MatterP1/2/3 Forces**Year 11**P10/11 forcesP15 electromagnetsP16 space |
| **Cross – curricular / Authentic Links** | Yrs 7 - 11 maths algebraYr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr 7 sets and probabilityYr 8-10 Maths Ratio and scale Yr 9 maths solving ratio and proportion problemsYr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 8 probabilityYr 9 English DystopiaYr 9 maths using %Yr10 maths probablityYr10 Maths interpreting data# Yr 11 Maths – graphs  | Yrs 7 - 11 maths algebraYr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr8 maths standard index form Y8 maths representing data / working in the Cartesian planeYr 9 maths using %Yr10 Maths interpreting dataYr 11 Maths – graphs | Yrs 7 - 11 maths algebraYr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr 7 tech – introduction projectYr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 9 maths using %Yr10 Maths interpreting dataYr 11 Maths – graphs | Yrs 7 - 11 maths algebraYr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 9 maths using %Yr10 Maths interpreting dataYr10 product design – angle poise lampYr 11 Maths – graphs | Yrs 7 - 11 maths algebraYr 7 maths fractions, decimals and %Yr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 9 maths using %Yr10 Maths interpreting dataYr10 product design – angle poise lampYr 11 Maths – graphs | Yrs 7 - 11 maths algebraYr 7 Maths multiplication and divisionYr7 maths Construction and measuringYr8 maths standard index formY8 maths representing data / working in the Cartesian planeYr 9 maths using %YR 9 maths Pythagoras theoremYr9 maths ratesYr10 Maths interpreting dataYr 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 QMA1. 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: ForcesY9 P11: Gravity & MotionY10 P1,2,3: Energy & Energy ResourcesY8 P6: Pressure & Levers | Y8 P5: LightY8 P7: SoundY8 P8: Heat transfersY9 P11: Gravity & MotionY10 P7: Radioactivity | Y8 P5: LightY8 P8: Heating & CoolingY10 P7: Radioactivity | Y8 P8: MagnetsY7 P1: Circuits & ElectricityY9 P10: Energy & ElectricityY10 P4,5: ElectricityY10 P1,2,3: Energy & Energy ResourcesY8 P7: SoundY7 P2: Solar Systems |  |  |
| **Cross – curricular / Authentic Links** | **Maths:**Y7 Algebraic thinkingY7 Place value & proportionY7 Application of numberY7 Directed number & fractional thinkingY7 Developing number senseY8 RepresentationsY8 Algebraic techniquesY8 Developing numberY8 Reasoning with dataY9 Reasoning with algebraY9 Reasoning with numberY9 Reasoning with proportionY10 GeometryY11 GraphsY11 AlgebraY11 Reasoning**Product Design:**Y10: Angle-poise lamp | **Maths:**Y7 Algebraic thinkingY7 Place value & proportionY7 Application of numberY7 Directed number & fractional thinkingY7 Developing number senseY8 RepresentationsY8 Algebraic techniquesY8 Developing numberY8 Reasoning with dataY9 Reasoning with numberY9 Reasoning with proportionY11 AlgebraY11 Reasoning**Geography**Y9 VolcanoesY9 Earthquakes | **Maths:**Y7 Place value & proportionY7 Application of numberY7 Directed number & fractional thinking | **Maths:**Y7 Algebraic thinkingY7 Place value & proportionY7 Application of numberY7 Directed number & fractional thinkingY7 Developing number senseY8 Algebraic techniquesY8 Developing numberY9 Reasoning with numberY9 Reasoning with proportionY10 Proportions & proportional changeY11 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** |  |  |  |  |  |  |
| **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 | 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 QMANovember mock exams (TCAT QMA3) | Waves and Light QMA | Electromagnetism QMASpace 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. |
|  | **Enrichment** |  |  |  |  |  |  |