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| **Sir Harry Smith Community College Curriculum Map SUBJECT: Science YEAR 11**  |
| Curriculum Intent: ***To provide a knowledge rich, spiral curriculum through inclusive science lessons that fit and expand our learner’s context in an environment that builds resilience.*** |
| **School Values** | **Curriculum Focus** | **Term 1** | **Term 2**  | **Term 3**  |
| **High Quality Learning Experience** | **Key Vocabulary** | **Homeostasis & Response***central nervous system (CNS),* *cerebral cortex, ciliary muscles, coordination centres, effectors, motor neurones, neurones, receptors, reflex arcs, reflexes, sensory neurone, stimuli, dialysis, thermoregulatory centre, vasoconstriction, vasodilation, adrenaline, auxin, endocrine system, follicle stimulating hormone (FSH),*  *glucagon, hormones, insulin, oestrogen, ovaries, ovulation, phototropism, pituitary gland, testosterone.***Organic Chemistry***alkane, alkene, cracking, distillation, double bond, fractional distillation, hydrocarbon, oxidised, saturated hydrocarbon, thermal decomposition, unsaturated hydrocarbon, viscosity,* *Rf (retention factor), addition polymerisation, monomers, polymer, fermentation, functional group, homologous series, thermosetting polymer, thermosoftening polymer.***Magnetism & Electromagnets***electromagnet, electromagnetic induction, Fleming’s left-hand rule, generator effect, induced magnetism, magnetic field, magnetic field line, magnetic flux density, motor effect, solenoid, split-ring commutator, step-down transformer, step-up transformer, transformer*, | **Inheritance, Variation & Evolution***alleles, asexual reproduction, carriers, cystic fibrosis, dominant allele, genetic engineering, genotype, heterozygote, homozygote, meiosis, mutation, natural selection, nucleotide, phenotype, polydactyly, recessive, sex chromosomes, archaea, classification, domain, evolutionary trees, extinction, speciation, species, mutation, natural selection, selective breeding, tissue culture.***Rate of Reaction***gradient, frequency, activation energy, catalyst, closed system, concentration, pressure, collision theory, equilibrium, anhydrous, hydrated, Le Châtelier’s Principle, dynamic equilibrium, reversible reaction.***Chemical Analysis***Pure, mixture, formulation, chromatogram, Rf value (retention factor), substance, solvent, solute, splint, ions, precipitate.* **Waves***amplitude, compression, echo, electromagnetic waves, frequency, longitudinal waves, mechanical wave, oscillate, primary seismic wave (P-wave), rarefaction, reflection, refraction, secondary seismic wave (S-wave), seismic waves, speed, transmission/transmitted, transverse wave, ultrasound wave, vibrate, wavelength, carrier waves, electromagnetic spectrum, ionisation, microwaves, optical fibre, radiation dose, radio waves, ultraviolet radiation (UV), wave speed.***Space (Separate Science ONLY)***Big Bang theory, black dwarf, black hole, centripetal force, cosmic microwave background radiation (CMBR), dark matter, main sequence, neutron star, protostar, red giant, red supergiant, red-shift, supernova. white dwarf.* | This term focuses on what students know and remember through revision and consolidation of all content leading up to the GCSE examinations. |

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| **Pursuit of Excellence** | **Substantive Knowledge****COMPOSITES** | An organism needs to be aware of the conditions both inside and outside of itself to keep internal conditions stableCarbon compounds are the backbone of life on our planet and there are many different uses and reactions of carbon-based moleculesState that fractional distillation separates compounds by boiling point.Magnetic fields can be used to produce electrical waves | The type of reproduction dictates the genetic variation of offspring and can lead to random mutationsReactions can only proceed if the activation energy is overcome and a collision is successful, the rate of collisions can be changedChemical tests can be performed to determine the products of a reactionWaves transfer energy and different waves have different useful propertiesMany components exist in space such as stars, planets, and moons. Observable evidence shows how these behave |  |
| **Substantive Knowledge****COMPONENTS***(Examples, this is not an exhaustive list)* | Explain how the structure of the nervous system is adapted to its function e.g. how receptors detect stimuliCompare the similarities and differences between a reflex action and a conscious responseName the first 4 alkanes as, methane, ethane, propane, butane.Know that long chain hydrocarbons are thermally decomposed into shorter more useful chains and that one of the products will always be an alkeneExplain how to see and find magnetic field lines around a bar magnet.Describe and use Flemings left hand rule. | Recall the main differences between asexual and sexual reproductionUse Genetic Cross diagrams to predict possible genotypes and phenotypes of offspring based on their parents’ genotypesExplain, using collision theory, how temperature changes the rate of a reactionDraw the representation of a reversible reactionState what is meant by reflection and refractionDescribe how frequency affects pitch and amplitude affects volumeExplain what is meant by a protostar and how energy is released inside the sunExplain how the velocity of a body in a circular orbit changes as the body moves around the orbit |  |
| **Disciplinary Practices** | Research using a range of media such as articles, websites, and booksDraw tables correctly for data collection during practical activitiesWrite a method to investigate a hypothesisSelect the correct format for presenting dataEvaluate methods and models and suggest improvementsRearrange formulae to calculate quantities such as mass, weight, and speedUse data to support or disprove a theorySelect the most appropriate apparatus for an experimental setupUse keywords in context to explain scientific phenomena through extended writing tasksDraw conclusions from evidence |
| **Extending the boundaries of learning** | **Cultural Capital and beyond the curriculum** | Links to scientific careers and the opportunity to speak to people working in the sectorScience clubGuest speakers and workshops |
| **Achievement** | **Assessment** | Assessment is carried out continuously during modules using an online formative platform.Summative assessment is carried out twice during the academic year in the form of mock examinations.Students complete progress tasks throughout the year which challenges their scientific literacy and formatively assesses their understanding. Every lesson begins with retrieval practice to see what students know and remember. |
| **Valuing People** | **How our curriculum meets the needs of every individual** | Threshold concepts are identified for all topics.High expectations are set for all students that they will reach these concepts. When necessary, investigations and tasks are adapted to provide access to course content or to extend learning. |