

Year Group	Term	Key Themes (Intent)	Specification Links	Fundamental Skills	Misconceptions	SMSC/Fundamental British Values Links	Careers Context/Opportunities	Computing/Literacy/Numeracy Opportunities
Y7	HT1A	<p>Introduction to key skills Students will gain an understanding of the variables within an experiment and how to write an effective method.</p> <p>Acids, Alkalis and Safety in Science; Students will learn about safety in the lab, followed by the pH scale in relation to acids and alkalis. Following this, students will learn about indicators and how to test for acids and alkalis.</p> <p>Cells; Students will learn about differences in animal and plant cells in terms of structure, followed by studying the structure and function of specialised cells. Movement in and out of cells is also covered.</p>	<p>KS3 National Curriculum: Chemical reactions</p> <p>KS3 National Curriculum: Cells and organisation</p>	<p>To design a practical to test which indigestion tablet works best.</p> <p>To measure the amount of an indigestion tablet needed to neutralise an acid.</p> <p>To label plant and animal cells.</p> <p>To describe the movement of particles in diffusion.</p>	<p>1. Strong acids and concentrated acids are the same.</p> <p>2. All acids are dangerous</p> <p>3. Weak acids can be more dangerous than strong acids.</p> <p>1. The nucleus is the brain of a cell.</p> <p>2. Plants aren't living.</p> <p>3. Root hair cells are found in your hair.</p>	<p>S- why we study science? M - Ethics of embryonic stem cells S- Being safe in the laboratory C- plant and animal cells biodiversity</p> <p>British values. Following the rules of a laboratory will help pupils understand the importance of following the rules outside of school. This will help produce law obeying British citizens.</p>	<p>Careers within a lab setting</p> <p>- Stem cell research - Burnley General Hospital - Cancer research</p>	<p>Literacy - spelling of new scientific words including lab apparatus.</p> <p>Numeracy - pH scale, difference in concentration for movement of cells/gradient</p> <p>Computing- Pupils can use the internet to design a poster on different hazards caused by acids and alkalis.</p>
	HT1B	<p>Forces - Pupils will learn about the different types of forces that exist (both contact and non-contact), and how to measure Force using a newtonmeter. Differences between balanced and unbalanced forces will be studied, along with the gravitational force that exists on earth.</p> <p>Body systems + Respiration - Pupils will learn about the different levels of organisation, followed by the structure and function of the respiratory system and the skeletal system. This will include the process of movement of joints. The effects of smoking and drinking will also be covered and how this impacts the body.</p>	<p>KS3 National Curriculum: Forces Balanced forces Forces and motion</p> <p>KS3 National Curriculum: The skeletal and muscular systems Gas exchange systems Cellular respiration</p>	<p>To plot points in a graph showing the relationship to varying masses and the extension of a spring.</p> <p>To evaluate the importance of cells working together in a multi-cellular organism.</p>	<p>1. An object can't move if the forces are balanced.</p> <p>2. Mass and weight are the same thing!</p> <p>3. Friction only happens when two solids come into contact with each other.</p> <p>1. Breathing and respiration are the same thing.</p> <p>2. All drugs are harmful.</p> <p>3. Energy can be created or destroyed.</p>	<p>S- effects of smoking and drinking on body, maintaining a healthy lifestyle M - Ethics of pregnant women smoking/drinking S-why is smoking and drinking in the young generation on the rise? C- linking culture and actions in terms of healthy lifestyle; it has become more "trendy" to eat healthy. British Values Democracy and individual liberty is shown during a debate on whether smoking should be banned.</p>	<p>Accelerator Operator. Applications Engineer. Data Analyst-Burnley Football Club/Lancashire Cricket Club. Design Engineer</p> <p>- Doctor-Padiham Medical Centre. - Nurse</p>	<p>Literacy - Writing a letter to persuade young people to learn about the dangers of smoking/drinking/drugs</p> <p>Numeracy - equation for forces, calculating gravitational force</p> <p>Computing: Pupils must create a leaflet for homework for a doctor's surgery about the risks of drugs.</p>
	HT2A	<p>Particle theory and atoms, mixtures, and compounds: Pupils will learn about atoms and their arrangement in different states, the differences in arrangement of particles in atoms, mixtures and compounds with explanation of bonding.</p> <p>Interdependence and Variation; Pupils will learn about how plants and animals are adapted to live in their environment, such as camels, polar bears etc. How an ecosystem is linked together, including biodiversity, bioaccumulation, and symbiotic/symbiotic relationships. Investigating food chains and how we can create food webs.</p>	<p>KS3 National Curriculum: Atoms, elements and compounds.</p> <p>KS3 National Curriculum: Inheritance, chromosomes, DNA and genes</p>	<p>To predict the properties of different substances depending on their state of matter.</p> <p>1. Genes determine all traits.</p> <p>2. Two blue eyed parents must have a blue eyed child/ two parents with ginger hair are needed for a child to have ginger hair.</p> <p>3. Your genes never change</p>	<p>1. Particles change size in different states.</p> <p>2. Solid particles can't move.</p> <p>3. Elements only have one atom.</p> <p>1. Genes determine all traits.</p> <p>2. Two blue eyed parents must have a blue eyed child/ two parents with ginger hair are needed for a child to have ginger hair.</p> <p>3. Your genes never change,</p>	<p>S - Impact of periodic table discovery on society M - should we interfere with a natural food chain for our benefit? Should zoos be allowed? S - biodiversity and its effects C - Big bang theory</p> <p>British values Variation can be used to show that everyone is different, this can be linked to respecting others and embracing diversity.</p>	<p>Chemical consultant Analytic chemist chemical engineer Pharmacist Pharmacologist</p> <p>Biologist Zoologist- Blackpool Zoo. Researcher Biodiversity planning officer</p>	<p>Literacy - spellings of new terminology in reproduction topic</p> <p>Numeracy - number of atoms in mixtures and compounds</p> <p>Computing: Creating food chains and webs on Microsoft.</p>
	HT2B	<p>Light and Sound; Pupils will learn about how light travels, and a brief introduction to reflection, refraction, and colour. This will include calculating the angle of reflection and refraction. The process of how a camera works will also be explored. An introduction to sound in terms of waves will be studied, followed by echoes and how an ultrasound works.</p> <p>Reproduction - male and female reproductive system, and an insight to the functions of each of the organs. The process of fertilisation in human reproduction and plant reproduction, along with the menstrual cycle, and development of a foetus.</p>	<p>KS3 National Curriculum: Sound waves. Light waves.</p> <p>KS3 National Curriculum: Reproduction</p>	<p>To measure the angle of incidence and reflection.</p> <p>To describe the events of menstruation</p>	<p>1. Only shiny materials reflect light.</p> <p>2. Black doesn't reflect any light.</p> <p>3. The higher the pitch the louder the sound.</p> <p>1. A baby grows in a woman's tummy.</p> <p>2. Fertilisation happens in the vagina.</p> <p>3 Plants are either male or female as they undergo reproduction (clarify asexual)</p>	<p>S- IVF and fertility treatment, how our bodies change during puberty. M - should abortion be allowed? Ethics around contraception, S- Teenage pregnancy. C- menstrual cycle</p> <p>British values Individual Liberty: Reproduction will be linked to show the importance of rights, choice and consent.</p>	<p>Medicine Electronic engineering Seismology Meteorology Physical Oceanography</p> <p>Midwife-Burnley General Hospital Doctor Nurse Environmental scientist-Burnley College A level.</p>	<p>Literacy - spellings of new terminology in reproduction topic</p> <p>Numeracy - calculating angle of incidence/reflection</p> <p>Computing: Pupils can research the different stages and time periods of the development of a foetus.</p>
	HT3A	<p>Introduction to chemical reactions; Pupils will learn about the differences between chemical and physical reactions. A brief overview of different types of chemical reactions, followed by looking at each type in detail, accompanied with a practical.</p> <p>Food and Digestion - Pupils will learn about food groups, what a balanced diet looks like and how our body digests food. Testing for different types of food, and the causes and effects of obesity.</p>	<p>KS3: National Curriculum: Chemical reactions</p> <p>KS3 National Curriculum: Nutrition and digestion.</p>	<p>To design a risk assessment for reacting metals with oxygen.</p> <p>To design a diet plan for an athlete.</p>	<p>1. A soluble substance disappears when it is placed in a liquid.</p> <p>2. Fizzing means the metal is disappearing.</p> <p>3. Gases don't have a mass.</p> <p>1. All fats are bad for you.</p> <p>2. Food is absorbed in the stomach.</p> <p>3. Digestion of food only starts when food reaches the stomach.</p>	<p>S - being more eco-aware M - the overuse of energy in the world today, and what would happen if it ran out S- balanced diet and importance of eatwell plate C- different types of foods in different cultures</p> <p>British values UK laws on carbon footprint (chemical reactions)</p>	<p>Forensic scientist Biomedical engineer Chemical engineer Analytical chemist</p> <p>Nutritionist- Burnley Football Club. Doctor Nurse- Burnley General Hospital</p>	<p>Literacy - spellings of different reaction types, writing a letter to the public about the dangers of energy waste</p> <p>Numeracy - Calculating a change in mass.</p> <p>Computing - Pupils can use iPads to research common physical and chemical reactions that could be taking place in their home.</p>

	HT3B	<p>Key skills week Pupils will complete retrieval on investigative skills such as writing a method and identifying variables.</p> <p>Space and the Universe; Pupil will learn about the planets of the universe and the order they are present in relation to distance from the sun. The earth orbit cycle will also be looked at, along with the occurrence so seasons. The moon cycle is also studied.</p>	<p>KS3 National Curriculum: Inheritance, chromosomes, DNA and genes</p> <p>KS3 National Curriculum: . Space physics</p>	<p>To calculate the percentage of an individual being a disease carrier.</p> <p>To explain why we get seasonal change</p>	<p>1. Genes determine all traits. 2. Two blue eyed parents must have a blue eyed child/ two parents with ginger hair are needed for a child to have ginger hair. 3. Your genes never change,</p> <p>1. The Earth is the centre of the universe. 2. One side of the moon is always dark. 3. Everything in the universe orbits the sun.</p>	<p>S - how the earth orbits the sun, climate change. M - should we interfere with a natural food chain for our benefit? Should zoos be allowed? S - biodiversity and its effects C - Big bang theory</p> <p>British values Variation can be used to show that everyone is different, this can be linked to respecting others and embracing diversity.</p>	<p>Biologist Zoologist- Blackpool Zoo. Researcher Biodiversity planning officer</p> <p>NASA Communication technician Radar technician Computer aided design technician Astronaut Meteorologist</p>	<p>Literacy - key word list, comprehensions</p> <p>Numeracy - calculating number of days in a cycle and how we get that number</p> <p>Computing- Creating food chains and webs on Microsoft.</p>
	HT1A	<p>Photosynthesis, Leaves and Plants (12 lessons) In this topic pupils will learn about the different tissues within plant leaves and their function. (Spongy Mesophyll, Palisade cells, Epidermis, Xylem and Phloem) They will gain an understanding of the process of photosynthesis and the reactants involved (Water, carbon dioxide and sunlight)</p> <p>Separation techniques and water (10 lessons) In this topic pupils will learn about the different techniques to separate mixtures such as Filtering, sieving, evaporation and chromatography. They will understand the difference between a solute, solvent and solution.</p>	<p>National curriculum programme of study Biology Material cycles</p> <p>Energy National curriculum programme of study pure and impure substances</p>	<p>Photosynthesis, Leaves and Plants: Evaluate the key functions a plant needs to carry out to survive</p> <p>Separation techniques and water : Describe different methods of separating mixtures and solutions including distillation, filtration and chromatography.</p>	<p>Photosynthesis, leaves and plants -plants produce carbon dioxide, leaves take in water, all substances a plant needs to grow are taken in through the roots.</p> <p>Separation techniques - evaporation and boiling are the same thing, mixtures can only be separated using one technique, Filtration can separate solutions.</p>	<p>Spiritual Discuss interdependence between humans and plants. Can we survive without them? Moral It teaches pupils to look after plants and their importance. (production of oxygen for us) Social What are the consequences of deforestation? Cultural Investigate methods of providing safe drinking water for disadvantaged communities around the world British values Rule of law relates to students following laboratory rules for the safety of all</p>	<p>• Environmental Engineer • Eden project • Ecologist • Protecting endangered species of plants • Piping Designer to separate corrosive liquid (Burnley Borough Council)</p>	<p>Literacy Write a short story using the keywords (roots, xylem, phloem, leaf, stem) to show how water and sugars are transported around a plant</p> <p>Numeracy Counting number of stomata in leaves Conservation of mass</p> <p>Computing link Produce a leaflet on different methods of separation techniques using the internet for research</p>
	HT1B	<p>Energy (10 lessons) Pupils will learn the equations to key calculations such as Power, Kinetic energy, Gravitational potential energy and efficiency. They will gain an understanding on the conservation of energy and the importance of it. .</p> <p>Periodic table (7 lessons) In this topic pupils will obtain knowledge on how to identify metals, non-metals, periods and groups on a period table. They will observe the reactions of alkali metals with water and construct word equations to prove this. In addition they will explain the key difference in the reactivity between alkali metals, the Halogens and the Noble gases.</p>	<p>National curriculum programme of study; Physics; energy</p> <p>National curriculum programme of study; Chemistry; periodic table</p>	<p>Energy calculations: Use various equations to calculate power, work done, and energy. Periodic table: Explain trends and reactivity in the periodic table, and describe how it is arranged and why it is arranged in this way.</p>	<p>Energy calculations - friction is a form of energy, dissipated energy means it is being destroyed and energy can only be transferred into one other type.</p> <p>Periodic table - all metals are shiny, pupils saying the invention of new elements rather than discovery. A metal can displace another metal if it is "stronger".</p>	<p>Are we right to use technology which is damaging the environment?</p> <p>Social Students are encouraged to debate on the best methods to minimise the environmental impact whilst creating energy. Cultural Is it acceptable to charge a higher price for energy efficient products, when we should be using them to protect the environment? British values Should we invest in discovering elements knowing they could have detrimental effects, i.e</p>	<p>Energy Assessor Gas Engineer Energy conservation engineer MB aerospace • Power Plant Operators, Distributors and Dispatchers (BAE systems)</p>	<p>Literacy Writing a conclusion, explain in the reactivity between group 1 and 7.</p> <p>Numeracy Re-arranging equations to calculate mass, energy and Power</p> <p>Computing Using computers to research the history of the periodic table and producing a timeline</p>
	HT2A	<p>Electricity (12 lessons) In this topic pupils will gain an understanding of how to draw circuit symbols, the key difference between series and parallel circuits. They will also explore how altering the voltage can affect current.</p> <p>Inheritance, Variation and Evolution(14 lessons) Pupils will gain an understanding that variation can be either inherited, caused by the environment and in some cases a combination of both. They will explore the importance of variation between individuals and why this is important for the survival of a species, helping to avoid extinction in an always changing environment.</p>	<p>National curriculum programme of study; Physics; electricity and electromagnetism</p> <p>National curriculum programme of study; Biology; interactions and interdependencies</p>	<p>Electricity: Use practical skills to set up a variety of circuits and calculate different resistance and voltage in a circuit Inheritance, Variation and Evolution: Explain the importance and occurrence of variation, explain how specific species have evolved in order to survive.</p>	<p>Electricity - batteries store charge, current finds the easiest route around a circuit, Batteries contain electricity. Battery and cell is the same thing. Inheritance, variation and evolution - each characteristic is controlled by a single gene, extinction always happens suddenly due to one catastrophic event, Adaptations are only caused by mutations.</p>	<p>Does having certain variation (eye colour, skin colour) make us better than another human? Moral Do we have a moral responsibility to use more energy efficient items? Social Variation between individuals is important for the survival of a species, helping it to avoid extinction in an always changing environment Cultural Look at how people's beliefs can be influenced by others about how humans developed. i.e. evolved from other animals or did not</p>	<p>• Electricians • Line Installers and Repairers • Electrical and Electronics Engineers • Construction Managers Research Scientist (Diseases) Pharmacologist Geneticist Burnley General Hospital</p>	<p>Literacy Reading and researching development in medicine and curing diseases.</p> <p>Numeracy Calculating resistance using current and voltage</p> <p>Computing Create a poster on endangered and extinct animals using the Ipad for research</p>

<p>HT2B</p>	<p>Earth's Resources and Climate (12 lessons) Pupils will discuss how carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels). In addition they will learn there is only a certain quantity of any resource on Earth, so the faster it is extracted, the sooner it will run out. Recycling reduces the need to extract resources.</p> <p>Microbes and Disease (12 lessons) Pupils will discover key concepts such as the variation in reproduction between Bacteria and a Virus. They will learn the strategies deployed by white blood cells to fight infection. They will analyse the role of vaccines to prevent getting diseases at a later point in life.</p>	<p>National curriculum programme of study; Chemistry; earth and atmosphere</p> <p>National curriculum programme of study Biology Structure and function of living organisms</p>	<p>Earth's Resources and Climate: Evaluate how certain aspects affect the earth's climate and explain how humans have impacted on this.</p> <p>Microbes and disease: Describe the specific diseases caused by a bacteria, virus and fungus, and explain their symptoms, transmission, prevention and treatment</p>	<p>Earth's resources and climate - Recent global warming is caused by the sun and that the earth's climate would naturally change without humans causing it</p> <p>Microbes and disease - all micro-organisms are bad, antibiotics can kill any micro-organism, viruses and bacteria reproduce in the same way.</p>	<p>Spiritual Discussing the use of Earth's resources. Do they exist for our benefit or should be they left alone? Moral Compare the relative effects of human-produced waste and the impact of global warming. Social Scientists have evidence that global warming caused by human activity is causing changes in climate. How can we reduce this? Cultural Students must consider their impact on the world around them and start to look at what we can do to help the next generation have a</p>	<p>Conservation Scientist Meteorologists Wind Turbine Technicians (Coal Clough Windfarm)</p> <p>Microbiologist Doctor Dentist Public health lawyer (Burnley general hospital)</p>	<p>Literacy Write an article outlining the key problems with using the Earth's resources, specifically non-renewable resources.</p> <p>Numeracy Analysing graphs showing changes in the Earth's resources over a period of time</p> <p>Computing Researching different affects of climate change and actions we can take to help stop climate change</p>
<p>HT3A</p>	<p>Heating and Cooling (8 lessons) Pupils will learn key concepts such as thermal energy of an object in relation to mass, temperature and material. When there is a temperature difference, energy transfers from the hotter to the cooler object. Pupils will discuss the pathways of thermal energy which include conduction and convection, and by radiation.</p> <p>Magnetism and Electromagnets (10 lessons) Pupils will identify an electromagnet uses the principle that a current through a wire causes a magnetic field. Its strength depends on the current, the core and the number of coils in the solenoid. Furthermore, they will gain an understanding that magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction. The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences.</p>	<p>National curriculum programme of study; Physics; matter</p> <p>National curriculum programme of study; Physics; electricity and electromagnetism</p>	<p>Heating and cooling: Evaluate the difference between conduction, convection and radiation</p> <p>Magnetism and Electromagnets: Describe the uses of magnets and explain how magnetic fields are formed</p>	<p>Heating and Cooling - Heat and temperature are the same, Boiling is the maximum temperature a substance can reach. Vacuum has particles.</p> <p>Magnetism and electromagnets- larger magnets are always stronger than smaller magnets and all metals are attracted to magnets</p>	<p>Spiritual Is it right to delay death by using medication? Moral Should we test medicines for humans that could save lives on animals causing them harm? Social How we can protect ourselves and others against the spread of microbes reinforcing healthy choices in relation to hygiene. Cultural Do we blindly follow advice given to us by doctors or should vaccines be evaluated for the disadvantages? British values UK law suggests vaccinations are not compulsory, however should they be?</p>	<p>Thermal Architect</p> <p>Auto Mechanic Robotic engineer MRI Technicians (Burnley Auto Mechanical)</p>	<p>Literacy Write up of practical for growing bacteria on agar plates.</p> <p>Numeracy Analyse graph of bacteria life cycle</p> <p>Computing Use the internet to research disease pandemics linked to the study of microbes and diseases</p>
<p>HT3B</p>	<p>Speed, Density and Pressure (12 lessons) Pupils will explore if the overall, resultant force on an object is unbalanced, along with motion changes (speeding up, slowing down and changing direction). They will be able to use the following equation to calculate the speed of an object: $speed (m/s) = distance (m) / time (s)$ or distance-time graphs, to calculate speed. In addition, they will learn how to calculate density of an object using volume and mass.</p> <p>Key skills week Pupils will complete retrieval on investigative skills such as writing a method for unknown practicals and identifying variables.</p> <p>Crest award (Bronze) The Bronze Award introduce students to project work empowering them to work like real scientists, technologists, engineers or mathematicians. Students work independently or in groups to plan and run a project addressing a real-world STEM problem.</p>	<p>National curriculum programme of study; Physics; Motion and forces</p>	<p>Calculating speed using a distance time graph, conducting a practical, analysing results.</p>	<p>Speed density and pressure - The weight of an object determines if it will sink or float, mass and volume mean the same thing, thinking motion is simply either an object moving or not moving</p>	<p>Spiritual The desire to make positive contributions in bettering the technology currently available. (Crest award) Moral Analysing stopping and breaking speed - what speed should we be travelling at before we risk someone else's life? Social Developing scientific experiments in order to better the community Cultural The culture of speeding (when young) and its potential impact. British values Practical activities in science require students to engage in</p>	<p>Aviation IT Car engineer Sports</p>	<p>Literacy Focus on the spelling of keywords and units. (Metres, minutes, acceleration, instantaneous,</p> <p>Numeracy Re-arranging to calculate speed, distance and time. Analysing distance time graphs to calculate speed. $F = m \times a$</p> <p>Computing Pupils can look at data loggers in practical's linked to the motion topic</p>
<p>HT1A + B</p>	<p>Cells In this section students will explore how structural differences between types of cells enables them to perform specific functions within the organism. These differences in cells are controlled by genes in the nucleus. For an organism to grow, cells must divide by mitosis producing two new identical cells. If cells are isolated at an early stage of growth before they have become too specialised, they can retain their ability to grow into a range of different types of cells..</p> <p>Atomic Structure and the Periodic Table In this section, students will learn about the periodic table and how it provides chemists with a structured organisation of the known chemical elements. The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges.</p>	<p>KS3 National Curriculum of study Biology Cells and Organisation</p> <p>KS3 National Curriculum - Chemistry: Atoms, elements and Compounds, Periodic table</p>	<p>Students will calculate magnification using the equation $magnification = \frac{Image\ size}{Actual\ size}$. They will observe a glass slide through a microscope and identify the visible organelles.</p> <p>Students will calculate number of protons, neutrons and electrons in isotopes, compare different models of the atom, and explain the different trends in groups of the periodic table.</p>	<p>Cell Biology -"All cells have a nucleus" - Mitochondria produces energy (energy can not be created) -"The job of the nucleus is to contain DNA".</p> <p>Atomic structure; 1. Bigger atom = bigger mass 2. Electrons travel in orbits (planetary) around the nucleus in the same way that planets orbit the sun 3. Molecules and compounds is the same thing.</p>	<p>social - How has an understanding of cells affected humankind? Moral - Is stem cell technology useful? Is it right to treat some people and not others? Spiritual - Should you be able to control the genetics of you child - or is this playing god? British Values - Use of embryonic stem cells to improve current medical services in the UK.</p>	<p>Biomedical science jobs in Lancashire.</p> <p>Research related job roles.</p> <p>Chemist / historian / museum employee. Database manager.</p> <p>Specific medical roles in Burnley General Hospital.</p> <p>I.G. Todd Pharmacy, Padiham.</p>	<p>Computing - use of modelling software to indicate the different size of cells</p> <p>Literacy - Write up for a method to prepare a glass slide to view cells.</p> <p>Numeracy - calculating the size of cells</p> <p>Literacy - Use of key-words. Long answer question about the development of the periodic table, also play about the development of atomic structure</p> <p>Numeracy - calculations of blood flow min, calculations involving numbers of sub atomic particles.</p>

Y9	HT2A	<p>Energy Calculations In this section students will learn the different types of energy transfers including gravitational potential, kinetic and elastic energy. They will also evaluate the use of fossil fuels and the impact of global warming.</p> <p>Particle model of Matter In this section, students will learn about the particle model theory and how it is widely used to predict the behaviour of solids, liquids and gases, along with its many applications in everyday life. It helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft. It also explains why it is difficult to make a good cup of tea high up a mountain!</p>	<p>KS3 National Curriculum of study Energy</p> <p>KS3 National Curriculum - Chemistry - The particulate nature of matter</p> <p>Physics - Matter</p>	<p>Students will use equations and re-arrange them to calculate power, energy, force and distance.</p> <p>Students will calculate the density of a substance using direct substitution of the formula for regular solids, explain Brownian motion in terms of particle behaviour and collisions, and link the speed of smoke particles to air particles.</p>	<p>Energy "Energy can be created" "Energy is a force" "Gravitational potential energy depends only on the height of an object".</p>	<p>Social - How has the increased use of energy transfers and electricity affected peoples lives. Moral - Which way of generating electricity is best? Why are people so afraid of nuclear power? Spiritual - Energy transfers in bungee jumping / sky diving. Cultural - why do different countries use different energy resources?</p> <p>British Value - Laws relating to speed limits and why they are important - linking to equations.</p>	<p>Any jobs within the energy sector. Also electrician, engineer (There are a number of engineering companies in Burnley and apprenticeships available at Burnley college.) Lots of jobs will be available in a low carbon economy.</p> <p>Plumber, engineer for reviving mills in Burnley.</p> <p>Most jobs require knowledge of particle theory</p>	<p>Computing - Computer models to show acceleration of an object.</p> <p>Literacy - Descriptions of energy changes within specific contexts e.g. power stations. Formal writing.</p> <p>Numeracy - Extended calculations within the topic - rearranging equations etc.</p> <p>Literacy - key descriptions about what happens to particles going through phase changes - ensuring the language and wording is correct and free from misconceptions.</p> <p>Numeracy - reading graphs to calculate melting and boiling points.</p>
	HT2B	<p>Digestion and Organisation In this section students will learn damage to any of the body systems can be debilitating if not fatal. Although there has been huge progress in surgical techniques, especially with regard to coronary heart disease, many interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. Students will also learn how the plant's transport system is dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis. In this section, students will learn about the human digestive system which aids in the breakdown of large insoluble molecules into small soluble molecules. In addition, they will explore the key organs involved in the digestive system and their function.</p> <p>Compounds and materials In this section, students will learn about the theories of structure and bonding to explain the physical and chemical properties of materials. Analysis of structures shows that atoms can be</p>	<p>KS3 National Curriculum of study Biology Nutrition and Digestion</p>	<p>Students will evaluate the use of statins and stents in treating heart conditions. Students will explain the importance of the essential nutrients required by the body. In addition, they will describe the food tests for proteins, carbohydrates and lipids.</p> <p>Compare different compounds in regards to their bonding Suggest the charges of ions when bonding takes place</p>	<p>Organisation "Plants are not living" "Plants absorb water from the leaves due to rain" "The circulatory system has one loop in which blood travels". "Digestion ends in the stomach or large intestine" "Digestion is the process which releases usable energy from food" "We breathe air through the oesophagus".</p> <p>1. Differentiate between ionic and covalent bonding in terms of electrons. 2. Difference between</p>	<p>Social - Why have problems with diseases like coronary heart disease increased over the past few years? Moral - Should all people in one country be provided with equal healthcare?</p> <p>British Values: Super size vs Super skinny – pictures of UK celebrities, newspaper articles, NHS guidelines, debates on funding and payment for operations and treatments for those who have made poor lifestyle choices.</p>	<p>GCMS Analyst, Lancashire</p> <p>Dietician - how can diets be improved to prevent obesity. Nurse / doctor - contextual situations about blood. Ecologist Gardener</p> <p>Biomedical Science jobs</p>	<p>Computing - How have pacemakers helped heart care? How does an ECG work?</p> <p>Literacy - Spelling of keywords; oesophagus</p> <p>Numeracy - calculations of blood flow min, calculations involving numbers of sub atomic particles.</p>
	HT3A	<p>Energetics In this section, students learn about the chemical reactions that can occur at vastly different rates. Whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are many variables that can be manipulated in order to speed them up or slow them down. Chemical reactions may also be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired product. Understanding energy changes that accompany chemical reactions is important for this process. In industry, chemists and chemical engineers determine the effect of different variables on reaction rate and yield of product. Whilst there may be compromises to be made, they carry out optimisation processes to ensure that enough product is produced within a sufficient time, and in an energy-efficient way.</p> <p>Chemical reactions In this section, students will acquire an understanding of chemical changes which began when people began experimenting with</p>	<p>National curriculum Energetics - Chemistry page 8</p> <p>KS3 National Curriculum - Chemical reactions, The Periodic table, Materials.</p>	<p>Students will measure temperature changes when substances react or dissolve in water.</p> <p>Students will explain how the reactivity of a metal is related to the tendency of the metal to form a positive ion. Practical skill - Write a comprehensive method to make a salt from carbonate + acid.</p>	<p>1. A burning candle is an example of an endothermic reaction 2. Rate of forward and reverse reaction is not the same as having equal concentrations of products and reactants 3. Rate and equilibria often get mixed up.</p> <p>Chemical changes 1. Charges at electrodes - students get mixed up. 2. Weak acids cannot be dangerous 3. A base/alkali inhibits the properties of an acid.</p>	<p>Social - How can the use of chemical reactions help people in their everyday lives? Moral - should the sale of acids be controlled? Spiritual - the power of positive energy. Cultural - how has the increased knowledge of chemical reactions affected different cultures e.g. the iron age etc.</p> <p>British values - Energy generation in the UK</p>	<p>metal extraction, pyrotechnics, engineer, process engineer, gas engineer, food scientist.</p> <p>This topic includes lots of problem solving - any job that requires this could be linked</p> <p>Smart meter energy - Dual Fuel engineer, Burnley</p> <p>Nuclear Scientist, paper manufacturer, pipe/service engineer,</p>	<p>Computing - using computer models to simulate reactions.</p> <p>Literacy - explaining chemical reactions, not just using equations.</p> <p>Numeracy - calculating energy changes. Balancing equations</p>
	HT3B	<p>Key skills week Pupils will complete retrieval on skills such as drawing graphs and calculating mean of data.</p> <p>Atoms and Radiation In this section, students will learn about ionising radiation and its uses along with hazards. Although radioactivity was discovered over a century ago, it took many nuclear physicists several decades to understand the structure of atoms, nuclear forces and stability. Early researchers suffered from their exposure to ionising radiation. Rules for radiological protection were first introduced in the 1930s and subsequently improved. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation.</p>	<p>National curriculum- Atomic Structure - Chemistry page 9</p>	<p>Radioactivity Students will explain the uses and dangers associated with using alpha, beta and gamma radiation. They will also compare the ionising and penetrating power of each type of radiation.</p>	<p>Radioactivity 'Only Gamma radiation is harmful' 'x-rays are safe as they are a medical procedure' 'Half-life of a substance is how long it takes to disappear'</p>	<p>Social - How have radioactive substances saved peoples lives - smoke alarms, radiography. Moral - Is it right for people to work with radioactive substances, even though we are aware the dangers they present Spiritual - Are we all made of stars? Ideas that all different atoms are made within stars as we all originally started as H atoms, but through fusion joined to make different atoms. Cultural - What are the different attitudes to radioisotopes around the world? Why do different cultures embrace / fear them?</p>	<p>radiographer, astronomer, scientist</p>	<p>Computing - Modelling radioactive decay. Completing research on the different types / discoveries of radiation</p> <p>Literacy - how the word radioactive is received. Evaluation of the dangers of each type of radioactivity.</p> <p>Numeracy - calculating half-lives, calculating radioactive decay equations (alpha and beta only)</p>

		AQA Combined Science Trilogy Course 8464	https://www.aqa.org.uk/subjects/science/gcse/combined-science-trilogy-8464			Across the Science Curriculum there are numerous specific opportunities to work on the above areas. Specific ideas are outlined below.	Careers opportunities are wide with qualifications in Science, especially ones that involve problem solving e.g. banker, builder, engineer or build on knowledge covered e.g. nurse, doctor, biologist	Numeracy - Biology has a minimum of 10%, Chemistry 20% and Physics 30% maths across the assessments. Literacy - there are many key words that are incorrectly used in everyday speech, these misconceptions need to be addressed. Pupils need to know and understand a large vocabulary for the GCSE Science course
		Atoms and Radiation In this section, students will learn about ionising radiation and its uses along with hazards. Although radioactivity was discovered over a century ago, it took many nuclear physicists several decades to understand the structure of atoms, nuclear forces and stability. Early researchers suffered from their exposure to ionising radiation. Rules for radiological protection were first introduced in the 1930s and subsequently improved. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation.	National curriculum- Atomic Structure - Chemistry page 9	Radioactivity Students will explain the uses and dangers associated with using alpha, beta and gamma radiation. They will also compare the ionising and penetrating power of each type of radiation.	Radioactivity 'Only Gamma radiation is harmful' 'x-rays are safe as they are a medical procedure' 'Half-life of a substance is how long it takes to disappear'	Social - How have radioactive substances saved peoples lives - smoke alarms, radiography. Moral - Is it right for people to work with radioactive substances, even though we are aware the dangers they present Spiritual - Are we all made of stars? Ideas that all different atoms are made within stars as we all originally started as H atoms, but through fusion joined to make different atoms. Cultural - What are the different attitudes to radioisotopes around the world? Why do different cultures embrace /	radiographer, astronomer, scientist	Computing - Modelling radioactive decay. Completing research on the different types / discoveries of radiation Literacy - how the word radioactive is received. Evaluation of the dangers of each type of radioactivity. Numeracy - calculating half-lives, calculating radioactive decay equations (alpha and beta only)
Y10	HT1A	Transition topics In this section pupils will learn about key required practical's such as Osmosis, how to make a salt and the effect of pH on enzyme activity. They will compare and contrast the movement of particles between the 3 processes; Diffusion, Osmosis and Active transport. They will explore the lock and key model and gain an understanding of the role of key enzymes in digestion. Pupils will explore how to extract Aluminium from it's ore, which is an essential metal in the manufacturing process of everyday objects.	AQA Trilogy; 4.1 Cell Biology (pg19) 4.2 Organisation (26) 5.4 Chemical changes (86) 5.1 Atomic structure (pg. 65) 6.1 Energy (pg. 116)	Students will define Osmosis and Active Transport and carry out a required practical to test the effect of sugar concentration on the rate of Osmosis. Students can calculate the amount of a substance using the moles equation, and describe oxidation and reduction in terms of electrons. Students can define and state	'Heat can kill enzymes' 'Neutralisation means an acid breaking down' 'Heat and temperature are the same'	Social - How has the increased use of energy transfers and electricity affected peoples lives. Moral - Should all people in one country be provided with equal healthcare? British Values: Supersize vs Super skinny – pictures of UK celebrities, newspaper articles, NHS guidelines, debates on funding and payment for operations and treatments for those who have made poor lifestyle choices. M S C British values	Plumber, engineer for reviving mills in Burnley. Any jobs within the energy sector. Also electrician, engineer (There are a number of engineering companies in Burnley and apprenticeships available at Burnley college.) Lots of jobs will be available in a low carbon economy.	Computing - Computer models to show changes in blood pressure and exercise Literacy - Descriptions of energy changes within specific contexts e.g. power stations. Formal writing. Numeracy - Extended calculations within the topic - rearranging equations etc.
	1A	Infection and Response In this section students will learn that pathogens are microorganisms such as viruses and bacteria that cause infectious diseases in animals and plants. They depend on their host to provide the conditions and nutrients that they need to grow and reproduce. They frequently produce toxins that damage tissues and make us feel ill. In addition, students will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease.	AQA Trilogy 4.3 Infection and Response (p33)	Students will explain the various modes of transmission of pathogens and analyse the use of antibiotics.	Infection and response "Bacteria are the only pathogen to cause a disease" "Antibiotics can be used to treat viral infections" "Cancer and tumours are identical"	Social - Development of antibiotic resistance and the potential problems this could cause. Moral - What moral obligations do drug companies have to ensure the health and well being of the general population. Spiritual - Why do people with illnesses often find religion? Cultural - Why have some cultures become 'anti-vaccinators' British Values - Discussion on Edward Jenner and his contribution to discovering vaccines and eradicating the small pox epidemic in Britain.	Any biomedical Science jobs e.g. nurse, doctor, pharmacologist, researcher. Working for a charity of public health body	Computing - predicting the spread of infection based on algorithms Literacy - describing and explaining infection and response in the body using key terms explicitly and correctly e.g. pathogen, antibody, antigen, antitoxin etc. Numeracy - calculating exponential rise in number of pathogens
	HT2A	Electricity In this section pupils will learn that electric charge is a fundamental property of matter everywhere. Understanding the difference in the microstructure of conductors, semiconductors and insulators makes it possible to design components and build electric circuits. Many circuits are powered with mains electricity, but portable electrical devices must use batteries of some kind. Electrical power fills the modern world with artificial light and sound, information and entertainment, remote sensing and control. The fundamentals of electromagnetism were worked out by scientists of the 19th century. However, power stations, like all machines, have a limited lifetime. If we all continue to demand more electricity this means building new power stations in every generation – but what mix of power stations can promise a	6.2 Electricity	Students will learn: To identify different circuit symbols. To calculate current, resistance and potential difference. To describe how a change in resistance affects the flow of electric current. To design a circuit to test the resistance of different components.	1. Objects become positively charged because they gain protons. 2. Current is used up by components. 3. Current is produced by a cell/battery	Social - Why is electricity vital to modern day society? How would life be different without electricity? Moral - Should all people be entitled to electricity? What type of power stations should be built. Spiritual - Does the increase in use of electrical items affect our spirituality? Cultural - why are plugs in different countries different? Are UK or US plugs safer?	Most jobs require knowledge of particle theory	Computing - application of some components in circuitry. Use of software to show differences in series / parallel circuits (where answers will be exact due to no issues with equipment!!) Literacy - lots of key definitions. Numeracy - use of different equations, multi-stage calculations.

	<p>HT2A</p>	<p>Quantitative Chemistry (Chemical calculation) In this section, students will learn about how Chemists use quantitative analysis to determine the formulae of compounds and the equations for reactions. Given this information, analysts can then use quantitative methods to determine the purity of chemical samples and to monitor the yield from chemical reactions. Chemical reactions can be classified in various ways. Identifying different types of chemical reaction allows chemists to make sense of how different chemicals react together, to establish patterns and to make predictions about the behaviour of other chemicals. Chemical equations provide a means of representing chemical reactions and are a key way for chemists to communicate chemical ideas.</p>	<p>AQA Trilogy; 5.3 Quantitative Chemistry (p 81)</p>	<p>Students will recognise and use expressions in standard form, Investigate mass changes using various apparatus, and calculate relative formula mass.</p>	<p>1. Distinguishing between atomic number and mass number. 2. Protons and neutrons have a mass of 1g. 3. Atoms and molecules have the same properties as the substance that they make up.</p>	<p>Social - Sharing of resources Moral - The obligation of Scientists to reduce waste through improved chemical reactions Spiritual - finding effective ways to communicate as Scientists did when establishing periodic patterns. Cultural - How different chemicals reacting together results in different products. British values - effectively communicating with people to get ideas across.</p>	<p>chemical engineer, scientist, food scientist, pharmacologist, process engineer. Any career that is dependant on maths based problem solving. GMCS analyst (Burnley)</p>	<p>Computing - modelling of processes to show chemical reactions. Literacy - key differences between atomic mass and molecular mass. Understanding of what questions are asking and deciding which calculation to complete Numeracy - many complex calculations within this topic, pupils have to use standard form frequently.</p>
	<p>HT2B</p>	<p>Bioenergetics (Photosynthesis and Respiration) In this section students will explore how plants harness the Sun's energy in photosynthesis in order to make food. This process liberates oxygen which has built up over millions of years in the Earth's atmosphere. Both animals and plants use this oxygen to oxidise food in a process called aerobic respiration which transfers the energy that the organism needs to perform its functions. Conversely, anaerobic respiration does not require oxygen to transfer energy. During vigorous exercise the human body is unable to supply the cells with sufficient oxygen and it switches to anaerobic respiration. This process will supply energy but also causes the build-up of lactic acid in muscles which causes fatigue.</p>	<p>AQA Trilogy 4.4 Bioenergetics (p37)</p>	<p>Students will explain the limiting factors of Photosynthesis and analyse results from the required practical to produce a graph and conclusion.</p>	<p>Bioenergetics "Breathing and respiration are the same" "We only breathe in oxygen" "Photosynthesis releases carbon dioxide"</p>	<p>Social - why are plants important for our survival? Moral - What is our responsibility in terms of maintaining rainforests? Cultural - How are some people less affected by anaerobic respiration than others Spiritual - breathing exercises and its impact. British Values - Pictures of athletes from UK in a variety of sports and this topic can be linked to how athletes have to prepare before an event in order for their body to carry out sufficient respiration.</p>	<p>Gardener, farmer, horticulturist. Personal trainer - The Gym in Burnley, Dietician, sportsperson.</p>	<p>Literacy - Spelling of key terminology such as Bioenergetics, aerobic, and limiting. Numeracy - Using graphs to show the rate of photosynthesis and limiting factors. Computing - analysing graphs on a computer to show breathing patterns of athletes during exercise.</p>
	<p>HT3A</p>	<p>The rate and extent of chemical change In this section, students will explore the variables that can be manipulated in order to speed up or slow down chemical reactions. An understanding of energy changes that accompany chemical reactions will also be looked at in order to identify how to maximise the yield of desired product. The effect of catalysts will be explored followed by the concept of reversible reactions and equilibrium. Chemical Analysis In this section, students will learn about the range of qualitative tests developed by analysts to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate. Instrumental methods provide fast, sensitive and accurate means of analysing chemicals, and are particularly useful when the amount of chemical being analysed is small. Forensic scientists and drug control scientists rely on such instrumental methods in their work.</p>	<p>AQA Trilogy; 5.6; The rate and extent of chemical change AQA Trilogy; 5.8 Chemical Analysis (p103)</p>	<p>Students will investigate the variables that affect temperature changes, and calculate energy transferred in chemical reactions using bond energies supplied. Students will analyse different tests to determine chemical composition, describe electrolysis with balanced equations and predict products for chemical reactions</p>	<p><u>The rate and extent of chemical change</u> 1. Increasing temperature lowers the activation energy. 2. Energy is released when bonds are broken (without understanding that energy is absorbed during formation of bonds) 3. Nothing happens at equilibrium. Chemical analysis - 1. Distinguishing between mixture of elements and mixture of compounds 2. Key terminology; e.g. solvent, solute, precipitate. 3. Relevant charges on the ions and how to determine these.</p>	<p>Social - Increasing the rate of reaction can make us more productive. Increasing productivity is normally a good thing. Moral - How can changing the rate of a chemical reaction be a positive thing to do, what impacts can it have? Spiritual - Cultural - Impact Fritz Haber had on WWI - due to his work on equilibrium reactions and ammonia Careers -</p>	<p>Any career where a rate of reaction is used e.g. laundrette, chef, cook, builder, plumber etc. Forensic Scientist, developmental scientist, food scientist.</p>	<p>Computing - modelling equilibrium situations that are difficult to see in the classroom. Computing - extend ideas about chemical analysis to those done on a computer e.g. mass spec / gas chromatography. Literacy - Procedural instructions e.g. how to complete gas tests. Literacy - model answers describing and explaining how collision theory can be affected by changing conditions of a reaction Numeracy - calculation of rate - from an equation and also by drawing a tangent onto a graph and calculating the gradient of this line.</p>
	<p>HT3B</p>	<p>C9 - Organic chemistry (8 lessons) In this section pupils will learn the chemistry of carbon compounds is so important that it forms a separate branch of chemistry. A great variety of carbon compounds is possible because carbon atoms can form chains and rings linked by C-C bonds. This branch of chemistry gets its name from the fact that the main sources of organic compounds are living, or once-living materials from plants and animals. These sources include fossil fuels which are a major source of feedstock for the petrochemical industry. Chemists are able to take organic molecules and modify them in many ways to make new and useful materials such as polymers, pharmaceuticals, perfumes and flavourings, dyes and detergents. Ecology In this section students will learn that the Sun is a source of energy that passes through ecosystems. Materials including carbon and water are continually recycled by the living world, being released through respiration of animals, plants and decomposing microorganisms and taken up by plants in photosynthesis</p>	<p>5.7 Organic Chemistry (p100) AQA Trilogy Ecology 4.7 Ecology (p57)</p>	<p>Students will gain an understanding of the hydrocarbons found in crude oil and will be able to recognise substances as alkanes given their formulae. Students will calculate and estimate the population of a given species. They will explain factors leading to global warming and deforestation.</p>	<p>Organic chemistry 'Boiling point does not change with increasing molecular size' 'Complete combustion produces oxygen' 'Alkanes are more reactive than alkenes' Ecology "The arrows in a food chain show what is being eaten by what" "Predator and prey populations are similar in size" "Varying the population size of a species may not affect an ecosystem because some organisms are not important".</p>	<p>Social - how our ecosystem and environment affects us, why are changes in our ecosystem going to have implications on humans? Moral - the importance of secure data and analysis if it used to convict criminals - a big use of chemical analysis. Spiritual - How could different ecosystems and the conditions in which humanity has grown affected spirituality differently. Cultural - How do different cultures look after the environment? British Values - Due to Climate change the average temperature in Britain is increasing</p>	<p>Any jobs that involve testing using chemicals. Petrochemical Industry - leads to many different industries; plastics, fuel, pharmaceuticals etc. Ecologist, zoo keeper, charity worker, ornithologist, environmentalist</p>	<p>Numeracy - statistical analysis of data obtained in fieldwork.</p>

	HT1A	<p>Forces</p> <p>Students will learn how engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in this way. Recent developments in artificial limbs use the analysis of forces to make movement possible.</p>	AQA GCSE combined trilogy 6.5 Forces (p138)	Evaluating the importance of different forces and being able to describe situations where different forces are in action	When you push or throw an object there continues to be a force in the direction of motion. A force is needed to keep an object moving. Anything moving has an unbalanced force acting on it.	<p>Social - Forces involved to help sort infrastructure projects out e.g. new bridges - maximum load etc. How forces affect stopping distance in a car.</p> <p>Spiritual - the idea of forces connecting people to each other and god and the differences of these to quantifiable forces.</p> <p>Cultural - How the use of forces can affect the development of theme park rides.</p> <p>British values - Rule of law relates to students following laboratory rules for the safety of all and the understanding of the need to have speed limits (speed, force, change of momentum)</p>	<p>Structural / mechanical engineer, surveyor, aeronautical engineer. (BAE systems)</p> <p>Playground designer</p>	<p>Computing - using models to resolve forces for complex structures</p> <p>Literacy - explaining how forces affect movement. Looking at direct translation of Newton's Laws to those we follow today and identifying differences.</p> <p>Numeracy - Use of equations and standard form in this topic area.</p>	
	HT1A	<p>B5- Homeostasis and Response</p> <p>In this section students will learn that cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. These control systems include receptors which sense changes and effectors that bring about changes. In this section we will explore the structure and function of the nervous system and how it can bring about fast responses. They will also explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility.</p>	AQA Trilogy 4.5 Homeostasis and Response (p 41)	Students will compare the pathway to a conscious and unconscious response by the nervous system.	<p>Homeostasis and Response</p> <p>"The body is always able to create a stable internal environment"</p> <p>"Electrical impulses are sent to the brain in reflex reactions"</p> <p>"Muscles are the only example of an effector"</p>	<p>Social - What is our responsibility towards taking care of our health to prevent getting diabetes.</p> <p>Moral - who should receive IVF treatment and why?</p> <p>Spiritual -who are we and what makes us, us? Should we interfere with 'gods' processes?</p> <p>British Values - UK laws relating to drugs and how they impact the nervous system and brain.</p>	<p>Working with genetics, research, family history, data analysis.</p> <p>Sports Scientist, fertility scientist.</p> <p>Psychologist,</p>	<p>Numeracy - Calculating a mean.</p> <p>Literacy - Detailed description of how hormones control fertility - writing for a purpose.</p> <p>Computing - Using a reaction time monitor (has to be linked to a computer) to show reaction time after consuming caffeine (Required Practical)</p>	
Y11	HT1B	<p>QLA from Mock exams</p> <p>Pupils will recap common misconceptions from their previous mock exam</p> <p>Variation, Genetics and Evolution</p>							
	HT2A	<p>In this section students will discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. In addition, students will gain an understanding of how these processes have allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering. In spite of the huge potential</p>	AQA Trilogy 4.6 Inheritance, Variation and Evolution (p47)	Students will evaluate the use of fossils as evidence for evolution and how life first formed.	<p>"Genes determine all characteristics of an organism"</p> <p>"A chromosome and gene are the same"</p> <p>"Evolution is a theory only about the origin of life.</p>	<p>Social - LINK human genome project - how similar are you to a fly, other people etc. How is the human genome project valuable?</p> <p>Moral - Is it right to create designer babies by using genetic engineering to control features of offspring.</p> <p>Spiritual - what makes us truly unique?</p> <p>Cultural - why do some diseases e.g. sickle cell anaemia affect certain groups?</p> <p>British Values - selective breeding – areas for debate and discussion in relation to UK laws and the ethics of selective breeding. This fits in very well with the ideas behind British</p>	<p>Research, selective breeding, farming, plant development.</p> <p>Genetic engineering.</p> <p>Conservationist.</p>	<p>Computing - Look at human genome - find out key parts about it (impossible without a computer)</p> <p>Literacy - lots of research that could be completed here - reading and evaluating non-fiction texts.</p> <p>Numeracy - identify characteristics of 1st and 2nd generation offspring from 2 parents using genetic crosses.</p>	
	HT2A	<p>Chemistry of the Atmosphere and Using Resources</p>	AQA Trilogy 5.9 Chemistry of the Atmosphere (pg106) Using resources 5.10 (pg110)	Pupils can describe the composition and evolution of the Earth's atmosphere as well as greenhouse gases, human contributions to pollution, global climate change, carbon footprint and atmospheric pollutants.	<p>Water vapour is not a green house gas'</p> <p>'Potable water is pure water'</p> <p>'Finite are resources that will not finish'</p>	<p>S-Human impact on our plant and environment</p> <p>M-What is our responsibility in providing clean water to all people</p> <p>S- Should you use energy resources that release more greenhouse gases</p> <p>British values - What is UK's responsibility to reduce carbon emissions?</p>	<p>Atmospheric chemist</p> <p>Environmentalist</p> <p>Geologist,</p> <p>Chemical Engineer</p>	<p>Computing - Analyse online data on the increase in carbon dioxide levels</p> <p>Literacy - Structure a 6 mark answer on how the Earth's Atmosphere has changed</p> <p>Numeracy -Write a balanced symbol equation for photosynthesis as this process is crucial in reducing levels of carbon dioxide.</p>	
	HT2B	<p>QLA from Mock exams</p> <p>Pupils will recap common misconceptions from their previous mock exam</p>							

		<p style="text-align: center;">Waves</p> <p>In this section, students will learn about Wave behaviour in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves.</p> <p style="text-align: center;">Magnetism and Electromagnetism</p> <p>In this section, students will learn about Electromagnetic effects and its uses in a variety of devices. Engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. It means that systems that involve control or communications can take full advantage of this.</p>	<p>AQA Trilogy; 6.6 Waves (p149)</p> <p>AQA Trilogy; 6.7 Magnetism and Electromagnetism (p153)</p>	<p>Calculate wave speed from the wave length and frequency</p> <p>Investigate how IR is absorbed/reflected depending on the surface</p> <p>Evaluate experimental techniques relating to calculations of the speed of waves.</p> <p>Sketch the shape of a field surrounding a solenoid</p> <p>Apply Flemings Left Hand Rule</p> <p>Explain how the force on a conductor causes rotation of a coil</p>	<p>1. Sound moves between particles of matter (in empty space) and then 'bumps into' the next matter particle.</p> <p>2. The existence of sound particles</p> <p>3. Amplitude and frequency are related</p> <p>1. All metals are attracted to a magnet.</p> <p>2. Magnetic poles are on the surface of the magnet</p> <p>3. Larger magnets are stronger than smaller magnets</p>	<p>Social - development of technology to use waves for communication and how this is changing and is likely to continue to change.</p> <p>Moral - Treating cancer using radiotherapy.</p> <p>Thorough research of new technologies.</p> <p>Spiritual - link waveform created by a singing bowl for meditation to an actual frequency - is the natural or man-made sound better?</p> <p>Cultural - skin cancer risk and prevalence in different cultures.</p> <p>Attitudes to skin colour</p>	<p>Mobile communications, radiographer, astronomer, detective, working for national grid or a power station, scrap yard.</p> <p>Working as a heat engineer</p> <p>Physics Engineer Graduate Programme (Clitheroe)</p>	<p>Computing - use of models to show wave interactions e.g.. ripple tank</p> <p>Literacy - use of key-terms in order. Ability to evaluate and compare data and information using comprehension techniques.</p> <p>Numeracy - equations and use of standard form throughout both topics</p>
	HT3B	Revision of all topics and examination preparation						