	Science *At Key Stage 3, our mission is to inspire curiosity about the natural world whilst building the foundational knowledge, practical skills and scientific thinking required for future success. Through the study of Biology, Chemistry and Physics, students develop an understanding of how science explains the world around them, learn to think critically about evidence, and become confident in applying scientific knowledge to real-world contexts. We aim to foster resilient, inquisitive learners who are equipped to question, investigate and communicate as scientists.*		
Key Stage 3 Long-Term Plan	Year 7	Year 8	Year 9
Autumn 1	Unit 7.1a Living body (Biology) This introduces the key idea that cells are the building blocks to life. It introduces the two main types of cells (prokaryotic and eukaryotic) before examining animal and plant cells in more detail (both types of eukaryotic). Next the topic considers some specific examples of specialised cells plant and animal cells before considering how groups of cells form tissues, groups of	Unit 8.1a How the body works (Biology) First, you will consider diseases we can catch, and how they are caused by pathogens. We then explore what pathogens are and how they differ from human cells. Next, you will investigate how our body can defend itself against pathogen attacks, before looking into how we use and develop medicines to help. Finally, you will explore diseases that you cannot catch, many of which are related to how we live our lives. You will look at the importance of diet and	Unit 9.1a Atomic Structure and the Periodic Table (chemistry) Addresses the big idea of science that "all matter in the Universe is made of very small particles." It reminds us that atoms are the building blocks of all matter, living and non-living. It also considers how electrons, despite being so incredibly small, are the essential features of all chemical reactions. The topic covers the history of our knowledge and understanding of the different atoms on Earth, how we represent and explain reactions before finally considering how we

	tissues form organs and groups of organs form organ systems. The remainder of the topic investigates some of the major organ systems within the human body, specifically.	exercising in maintaining a healthy body. Throughout the topic, scientific investigation skills will be taught, used, and practiced. With the intention to support your understanding of the concepts in greater depth and help you ask and answer important questions.	might separate one chemical from another
Autumn 1 Assessment:	Trust milestone assessment-50 multiple choice questions. Mid topic test unit 7.1a	***Students' progress will be assessed through short retrieval activities, in-class discussion, and ongoing monitoring of their work in books.*** Mid topic test- unit 8.1a (30 marks)	Science only (05/10/26-16/10/26) Trust Milestone 50 Multiple Choice Questions. Mid topic assessment Unit 9.1a (30 marks)
Autumn 2	Unit 7.1b Elements, mixtures and compounds. (chemistry) Introducing the idea particles and that the behaviour of these particles affects the large-scale changes we observe. The topic builds upon knowledge from key stage 2 and encourages you to build links between what happens at particle level and at the macro (large-scale)	Unit 8.1b Physical and chemical changes. (chemistry) Initially, you will be reminded of some of the fundamentals of chemistry and physics in terms of the difference between chemical and physical changes and the different states of matter. You will then investigate diffusion and consider its importance in our bodies. Next, you will investigate what	Unit 9.2b Cells and Division (Biology) Will look at how cells are structured in detail including different types of specialised cells. We will see how stem cells become specialised through differentiation. We will also look at how cells divide by the cell cycle. The topic introduces the idea of transport of substances in living things by diffusion, osmosis, and active transport.

	level in phenomena such as diffusion, changing state, heating up and cooling down. You will meet the idea of atoms for the first time. These examples of particles form a key idea across all sciences especially chemistry. You will look at how atoms are structured, how we record them in the Periodic Table and how we categorise them when they bond with other atoms.	happens when we heat or cool different states of matter. You will then look at density and how temperature can affect the density of an object. Finally, you will again revisit key ideas around chemical reactions, before looking in more detail at mixtures and the main methods we use for separating them. Throughout the topic, scientific investigation skills will be taught, used, and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	The topic will cover two Required Practicals: Magnification and Osmosis Throughout the topic, scientific investigation skills will be taught, used and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions
Autumn 2 Assessment:	Mid topic test unit 7.1b (30 marks) End of term assessment- units 7.1a and 7.1b Keywords and longer answer questions (50 marks)	Mid topic test unit 8.1b (30 marks) End of term assessment- units8.1a and 8.1b Keywords and longer answer questions (60 marks)	Mid topic Assessment 9.1b (30 marks) End of term assessment mainly based on 9.1a and 9.1b. Key knowledge, multiple choice and longer answer questions (60 marks)
Spring 1	Unit 7.2a Speed and forces (Physics)	Unit 8.2a Energy. (Physics)	Unit 9.2a Energy and Energy Resources

	This looks at the concept of speed and velocity in detail. How you can measure and plot them. The topic considers situations where speed changes and what causes acceleration to happen. It then looks at types of forces, how we represent them using diagrams, and finally, balanced and unbalanced forces. The topic introduces the idea of the slope of a graph being related to the rate of change of something, which is a key idea in the analysis of investigations. Finally, this topic provides an overview of two important areas in which students often run into difficulties later in school: stopping distances and force pairs. We hope to reduce future issues by providing some foreshadowing at this earlier, and appropriate, time. Throughout the topic, scientific investigation skills will be	Will introduce one of the fundamental ideas of physics: energy. Everything that happens or has the potential to happen involves energy being moved from one of 8 stores to another. There are only 4 ways it can move, and these are called pathways. Once you have met the 8 stores and 4 pathways, you will be shown how some energy is always dissipated to the thermal store of surroundings. You will investigate the difference between the terms 'efficient' and 'effective' and how they are often confused. Finally, you will evaluate different methods we may use to generate the electrical current required to power our modern lives. Throughout the topic, scientific investigation skills will be taught, used, and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	(Physics) This considers the concept of energy which emerged in the 19th century. The idea was used to explain the work output of steam engines and then generalised to understand other heat engines. It also became a key tool for understanding chemical reactions and biological systems. The use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce energy usage. The big idea of energy is that the total amount of energy in the universe is always the same but can be transferred from one energy store to another during an event.

	taught, used, and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.		
Spring 1 Assessment:	Mid topic test on unit 7.2a (30 marks)	Mid topic test unit 8.2a (30 marks)	Mid Topic Assessment 9.2a (30 Marks) Assessment Point 1 Mid Year trust Assessment 50 multiple Choice Questions (50 marks)
Spring 2	Unit 7.2b Habitats and Organisation (Biology) Will look at ecosystems and how they are structured. It will give you an overview of how all life on Earth depends upon green plants and algae and how they in turn, depend on the Sun. The topic builds on pyramids of numbers and introduces pyramids of biomass. It investigates how changes for one organism can impact others.	Unit 8.2b Evolution and inheritance. (Biology) Looks into the science behind why there is such a variety of different living things on Earth. It considers first, the types of differences between parent and offspring before looking then at how similarities are passed on. You will then compare the two different types of reproduction involving one (asexual) or two (sexual) parents. Next you will consider reproduction in humans and the reproductive process. You will learn about the main organs	Unit 9.2b Structure and Bonding (chemistry) Introduces the idea that in order to be stable, atoms need the electron structure of a Noble gas. They can achieve this either by losing or gaining electrons. An ion is an atom which has lost or gained electrons to become charged. Three types of bonding are discussed in this unit and are introduced in the order ionic, covalent metallic. You will find out about the properties of some of these substances and how their bonding affects their properties.

	Within this topic we assess the negative impact of humans as well as considering some of the positive things we are doing for our environment. Finally, you will look at how different organisms compete against each other and how this drives different adaptations to help them better suit their habitat. Throughout the topic, scientific investigation skills will be taught, used and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	and cycles involved in humans giving birth. Finally, you will look at how differences between individuals have been responsible for the evolution of the variety of species we see on Earth today. You will also look at how scientists try to classify millions of different species of living things. Throughout the topic, scientific investigation skills will be taught, used and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	Introduces allotropes of carbon and you will find out about some special materials and their properties and uses. Throughout the topic, scientific investigation skills will be taught, used and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions
Spring 2 Assessment:	Mid topic test unit 7.2b (30 marks) End of term assessment- units 7.2a and 7.2b Keywords and longer answer questions (50 marks)	Mid topic test unit 8.2b (30 marks) End of term assessment- units 8.2a and 8.2b Keywords and longer answer questions (50 marks)	Mid Topic Assessment 9.2b (30 Marks)
Summer 1	Unit 7.3a Common chemical	Unit 8.3 Chemistry on Earth.	Unit 9.3a Molecules and Matter and

	reactions (Chemistry) looks at a range of chemical reactions, some of which can be seen in everyday life. It begins by using word equations before looking at what happens between individual atoms during a chemical reaction. All chemical reactions can be thought of as atoms changing how they are bonded with others. Once you're confident with this concept, we introduce symbol equations and the idea that mass is conserved in all reactions. Conservation of mass is a key idea and leads into balancing of symbol equations. This skill is considered a block for some students so is introduced early to provide maximum practice and exposure. The definitions of atoms, molecules, elements and compounds is very important	(Chemistry) This topic brings together many strands of chemical reactions around us and helps you to see how they all have similarities. It starts by going back over the fundamentals of chemistry, supporting you in remembering the structure of atoms, compounds, and balanced symbol equations. The topic then looks at some common chemistry found in living things before looking in more detail at fuels we use to generate electrical current. Next, you will consider how some elements are more reactive than others, how the Periodic Table can show this, and how we might use this knowledge in our lives. Finally, the topic gives you the chance to see how and why the atmosphere of the Earth has changed over billions of years. It also looks at how recent actions by humans might be changing our atmosphere even more. Throughout the topic, scientific investigation skills will be taught, used,	Thermal Transfers (Physics) This topic considers one of the big ideas of science, that objects are made of particles with mass. Understanding particles helps us to design our world. You have met the particle model before in Year 7 and Year 8. It gives us a way to help explain and predict the behaviour of solids, liquids and gases. Knowing about the particle model also allows us to design vehicles from submarines to spacecraft. As well as explaining why sweating cools us down and why it is difficult to make a good cup of tea high up a mountain! You will learn about gas pressure and why hot weather is associated with high pressures.

	so is recovered from Topic 7.1b. Mixtures are included this time around. The topic ends by looking at some common reactions that you will meet later in the course, including acids and bases and combustion.	and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	
Summer 1 Assessment:	Mid topic test 7.3a (30 marks)	Mid topic test 8.3a (30 marks)	Mid topic assessment 9.3a (30marks)
Summer 2	Unit 7.3b Electricity. (Physics) This begins by looking at the concept of charge and charged particles in an atom. It then describes the two types of electricity: current (moving charge) and static (stationary charge). We will compare conductors and insulators by their ability to let charge flow. This concept of charge is fundamental so is addressed before we look in detail at current.	Unit 8.3b Magnetism and waves. (Physics) Initially, you will look at the phenomena of magnetism and magnetic fields. You will see how, using electrical current we can make non-magnetic materials act like magnets and where this may be useful. Next, you will look at what all waves have in common, the two types, and how we label them. You will also look at what happens when waves hit a boundary. Finally, you will use your new	Unit 9.3b Organisation in animals and plants (Biology) This unit builds on cells and their structure and how organs function in an organ system. Initially you will learn about how organisms are organised. Next, you will look at the human digestive and breathing systems, organs and transport in plants Finally, you will again revisit key ideas around how organs are adapted for their function

	Next, we introduce the idea of potential difference which is the essential component required to move a charge and cause a current. We then move on to developing understanding of current, before considering the resistance that opposes it. Some models for circuits are then explored and related to series and parallel circuits. General rules for how to build and draw circuits are shared and you will be given lots of practice to develop your skills doing both. Finally, the topic addresses electricity in the home, as this is an experience of electricity that we are all familiar with. It looks at the differences between mains electricity and batteries, along with some aspects of delivery, safety and environmental issues. Throughout the topic, scientific investigation skills will be	knowledge to consider some common waves that we experience in our everyday lives. Throughout the topic, scientific investigation skills will be taught, used, and practiced supporting your understanding of the concepts in greater depth and help you ask and answer important questions.	

	taught, used, and practiced. With the intention to support your understanding of the concepts in greater depth and help you ask and answer important questions.		
Summer 2 Assessment:	Mid topic test unit 7.3b (30 marks) End of term trust assessment- all units covered this academic year, Keywords and longer answer questions. (60 marks)	Mid topic test- unit 8.3b (30 marks) End of term assessment- all units covered this academic year. Assessing learned keyword knowledge and longer answer questions. (60 marks)	End of term assessment based on all topics covered in year 9. There is an equal mix of biology, chemistry and physics questions which are multiple choice, short sentences and longer answer questions. (78marks) Mid topic assessment 9.3b (30marks)
What will a student know by the end of each year? Why?	Students will know and understand: Cells, tissues, organs and organ systems. The particle model and the structure of matter. Elements, compounds and mixtures. Speed, forces and motion. Ecosystems, habitats and adaptation.	Students will know and understand: Health, disease and the body's defence systems. Physical and chemical changes. Energy stores, transfers and resources. Evolution, inheritance and reproduction. Chemistry of the Earth, reactivity and the atmosphere. Magnetism, waves and their applications.	Students will know and understand: Atomic structure and the periodic table. Cell structure, division and transport processes. Energy and energy resources. Bonding, structure and the properties of matter. Molecules, matter and thermal transfers. Organisation in animals and plants.

	Common chemical reactions. Electricity and simple circuits. How scientific investigations are planned, carried out and evaluated safely. Why? These topics provide the foundations of Biology, Chemistry and Physics, helping students understand how the natural world works. They develop practical, investigative and communication skills, enabling students to think scientifically, explain observations using evidence and prepare for more advanced scientific concepts in Years 8 and 9.	How scientific evidence is used to explain patterns and processes in the natural world. Why? These topics deepen students' understanding of scientific ideas and their relevance to everyday life. Students develop greater independence in practical work, strengthen their analytical and problem-solving skills, and begin to make connections between different areas of science, preparing them for the transition to GCSE study.	Key GCSE scientific concepts, calculations and practical skills across Biology, Chemistry and Physics. Why? These topics establish the core scientific knowledge and skills required for GCSE Science. Students develop a deeper understanding of scientific theory, strengthen their ability to apply knowledge to unfamiliar situations, analyse evidence, evaluate scientific ideas and communicate using accurate scientific vocabulary, ensuring they are well prepared for Key Stage 4 study and beyond.

Extra-Curricular Opportunities

- STEM club.
- British Science Week activities.
- Ecology and biodiversity fieldwork opportunities.
- Visits from STEM ambassadors.
- National competitions and challenges.
- Independent revision programmes using online learning platforms.

	Biology Our Biology curriculum enables students to understand the living world, from cells and organisms to ecosystems and the interactions that sustain life on Earth. Through studying Biology, students develop an appreciation of the complexity and diversity of living systems whilst exploring contemporary issues such as health, disease, genetics, biodiversity and sustainability. We aim to develop scientifically literate individuals who can make informed decisions about their own health, the environment and the biological challenges facing society.	
Key Stage 4 Long-Term Plan	Year 10	Year 11
Autumn 1	B5 Communicable Diseases Students will learn: Communicable and non-communicable diseases. Pathogens including bacteria, viruses, fungi and protists. Bacterial diseases (Salmonella, Gonorrhoea). Viral diseases (Measles, HIV, TMV). Fungal diseases (Rose Black Spot). Human defence systems. Vaccination. Antibiotics and painkillers. Drug discovery and development. Biology only Monoclonal antibodies and their medical applications. Higher Tier Interpreting vaccination data and evaluating	B13 Reproduction (Review and Extension) Consolidation and exam application of: Human reproduction. Hormonal control. Fertility treatment. Plant reproduction. B14 Variation and Evolution Consolidation and application of: Natural selection. Selective breeding. Genetic engineering. Evidence for evolution. B15 Genetics and Evolution Students will learn: DNA structure. Genome. Chromosomes and genes.

	disease prevention strategies. B6 Preventing and Treating Disease Students will learn: Discovery and development of drugs. Clinical trials. Testing procedures. Placebos and double-blind trials. Biology only Detailed applications of monoclonal antibodies.	Genetic inheritance. Inherited disorders. Sex determination. Biology only Genetic screening. Ethical implications of genetic technologies. Higher Tier Genetic cross calculations. Probability calculations involving inheritance
Autumn 1 Assessment:	Assessment covering B5–B6 including exam-style questions and scientific literacy.	Assessment covering B13–B15 including exam-style questions and scientific literacy.
Autumn 2	B8 Photosynthesis Students will learn: Photosynthesis equation. Limiting factors. Uses of glucose. Plant adaptations. Required Practical: Effect of light intensity on photosynthesis. B9 Respiration Students will learn: Aerobic respiration. Anaerobic respiration in animals and plants. Response to exercise. Metabolism.	B10 Homeostasis and Response – Nervous System Students will learn: Homeostasis. Nervous system structure. Reflex actions. Reflex arcs. Receptors. The brain. The eye and accommodation. Required Practical: Reaction time investigation. Biology only Brain scanning techniques. Neurosurgery and brain mapping.

	Required Practical: Investigating the effect of exercise on the body. Higher Tier Calculating rates from practical data. Interpretation of limiting factor graphs.	B11 Hormonal Coordination Students will learn: Endocrine system. Hormones. Control of blood glucose. Diabetes. Adrenaline. Thyroxine. Higher Tier Negative feedback mechanisms.
Autumn 2 Assessment:	Paper 1 mock/end of topic test	Yr11 Mock paper 1. Trust set paper 1 biology material, sat in the hall at individual desks. Combined science 70 marks, triple science 100 marks
Spring 1	B16 Adaptation, Interdependence and Competition Students will learn: Communities and ecosystems. Biotic and abiotic factors. Competition. Adaptations. Extremophiles. Biology only Detailed examples of adaptations in specific environments. Spring 1 Assessment	B12 Homeostasis in Action Students will learn: Kidney function. Water balance. ADH. Kidney failure and dialysis. Kidney transplants. Maintaining body temperature. Biology only Osmoregulation in detail. Higher Tier Detailed negative feedback control mechanisms.

Spring 1 Assessment:	End of topic test	Paper 2 mocks
Spring 2	B17 Organising an Ecosystem Students will learn: Food chains. Food webs. Trophic levels. Biomass transfer. Decomposition. Decay. Carbon cycle. Water cycle. Required Practical: Decay investigation. Higher Tier Biomass calculations	Synoptic Revision Students will revisit: Ecology. Homeostasis. Genetics. Evolution. Reproduction. Required Practicals. Targeted intervention based on assessment outcomes.
Spring 2 Assessment:	Yr10 Trust Mid year assessment. Trust assessment based on paper 1 content, 30 mins, sat in class, a selection of multiple choice and longer answer questions	Paper 1&2 mocks, end of topic tests
Summer 1	B18 Biodiversity and Ecosystems Students will learn: Biodiversity. Human impacts on ecosystems. Waste management. Land use.	GCSE Revision Programme Focus on: High-frequency exam topics. Required practicals. Exam technique. Command words.

	Conservation methods. Biology only Maintaining biodiversity. Conservation of genetic resources.	Retrieval and intervention.
Summer 1 Assessment:	End of topic test	Walking-talking mocks and exam practice.
Summer 2	B13 Reproduction Students will learn: Sexual and asexual reproduction. Human reproductive systems. Menstrual cycle. Hormones in reproduction. Contraception. Fertility treatments. Plant reproduction. Required Practical: Investigating seed germination factors. B14 Variation and Evolution Students will learn: Variation. Genetic and environmental causes. Evolution. Natural selection. Selective breeding. Genetic engineering. Evidence for evolution.	

	Biology only Cloning and tissue culture. Embryo transplants. Adult cell cloning.	
Summer 2 Assessment:	Year 10 Paper 1 mock. Trust set based on a full paper 1. Sat in the hall at individual exam desks. Combined 70 marks, Triple 100 marks	
What will a student know by the end of each year? Why?	Students will understand: Disease and the body's defence systems. Photosynthesis and respiration. Ecosystem interactions and biodiversity. Reproduction and variation. These topics provide essential biological knowledge and establish the ecological and genetic foundations required for successful study of inheritance, evolution and homeostasis in Year 11. Why? These topics provide essential biological knowledge and establish the ecological and genetic foundations required for successful study of inheritance, evolution, homeostasis and other advanced biological concepts in Year 11 and GCSE Biology.	Students will understand: Homeostasis and coordination. Genetics and inheritance. Evolution and biodiversity. Human and plant reproduction. The interdependence of biological systems. Students will be able to apply biological knowledge to unfamiliar contexts, analyse data, evaluate evidence and answer GCSE examination questions confidently. Why? These topics develop a deeper understanding of how living organisms function, adapt and interact. Students will be able to apply biological knowledge to unfamiliar contexts, analyse data, evaluate evidence and answer GCSE examination questions confidently, preparing them for further study and informed decision-making in everyday life.
Extra-Curricular Opportunities		

GCSE Biology intervention sessions.
Trust Science Masterclasses.
GCSE revision workshops.
STEM club.
British Science Week activities.
Ecology and biodiversity fieldwork opportunities.
Visits from STEM ambassadors.
National competitions and challenges.
Independent revision programmes using online learning platforms.

	SUBJECT Long-Term Plan Chemistry Our Chemistry curriculum empowers students to understand the composition, structure and behaviour of matter and how chemical processes shape the world around us. Through practical investigation and theoretical understanding, students explore the fundamental principles that underpin everything from materials and medicines to energy production and environmental sustainability. We aim to develop analytical thinkers who can explain change at both the macroscopic and particle level, applying scientific knowledge to solve problems and understand the modern world.	
Key Stage 4 Long-Term Plan	Year 10	Year 11
Autumn 1	Chemistry Unit C5 chemical changes (paper 1 content). The reactivity series shows how some common metals react with water and dilute acid. Using experiments to deduce order of reactivity. Explaining reduction and oxidation. Displacement reactions (HT) ionic equations, symbol equations, and half equations. Extracting metals- evaluate and interpret different extraction methods. Salts from metals- Use the reactions of Mg, Zn, and Fe with hydrochloric acid and sulfuric acid. (HT) redox reactions. Salts from insoluble bases-Reactions between acids and bases. Making a preparation of pure dry salts	Triple only -Chemistry unit C10- Organic reactions (paper 2) Reactions of the alkenes- how alkenes react with oxygen and how to draw the displayed structural formulae of the first 4 members of the alkenes, and the products of their addition reactions with hydrogen, water, chlorine, bromine and iodine. Structure of alcohols, carboxylic acids and esters. Reactions and uses of alcohols- writing balanced equations for reactions of alcohols with sodium and when they are oxidised. Carboxylic acids and esters- to recognise carboxylic acids and making esters. Triple only- Chemistry unit C11- Polymers (paper 2)

	(required practical). Predicting products from given reactants. Predicting formulae of salts. Neutralisation and the pH scale- looking at acids and alkalis, using universal indicator and using a strong acid to neutralise a strong alkali.	Addition polymerisation-to recognise addition polymers and monomers, to identify repeating units. Condensation polymerisation- functional groups and monomers and repeating nits in polymers. The formation of polyester. Natural polymers; sugars undergoing polymerisation to form starch and cellulose. Looking at making polypeptides and proteins from amino acids. DNA- the way monomers are arranged in DNA. Chemistry unit C12- Chemical Analysis (paper 2) Pure substances and mixtures- purity and impure substances in chemistry. Analysing chromatograms- using chromatography to distinguish pure and impure substances, calculate Rf values from chromatograms. Testing for gases- tests for Hydrogen, oxygen, carbon dioxide and chlorine. (T) Tests for positive ions-Using flame tests to identify ions and the precipitates formed in reactions with insoluble hydroxides. (T) tests for negative ions in carbonates, sulfates and halides. (T) instrumental analysis, advantages and disadvantages. Interpreting results from flame emission spectroscopy.

Autumn 1 Assessment:	Chemistry end of unit test – C5 (40 marks) higher and foundation	Chemistry end of unit test – C5 (40 marks) higher and foundation
Autumn 2	Chemistry unit C4 Chemical calculations (paper 1 content) Relative mases and moles (HT) calculate moles, given the mass of a substance (HT) Balanced symbol equations to calculate masses of reactants and products (HT) Limiting reactants. (T) Calculating the yield of a chemical reaction, factors that affect yield. Calculate theoretical yield and percentage yield. (T) Atom economy calculation and why it is important in industrial processes. Expressing concentrations using g/dm3. (HT) mass of solute and volume of a solution is related to concentration. (T) Titrations- accurately measuring acid and alkali using specialised chemistry equipment (T) titration calculations, determining an unknown concentration from reacting two volumes of 2 solutions, where one concentration is known.	Chemistry unit C13- The Earth's atmosphere (paper 2) History of our atmosphere, interpreting evidence and evaluating theories. Our evolving atmosphere Greenhouse gases and the greenhouse effect. Global climate change linked to carbon dioxide emissions and methane. Explaining scale, risk and environmental implications. Atmospheric pollutants from the combustion of fuels and the problems caused by increased pollutants in the air.

	(T) volumes of gases- calculate the volume of a gas at room temperature and pressure from mass and relative formula mass.	
Autumn 2 Assessment:	Chemistry end of unit test – C5 (40 marks) higher and foundation	Yr11 Mock paper 1. Trust set paper 1 chemistry material, sat in the hall at individual desks. Combined science 70 marks, triple science 100 marks
Spring 1	Chemistry unit C6- Electrolysis (paper 1 content) Introduction to electrolysis- what happens, what substances and the products Changes at the electrodes0 what happens to ions (HT) writing half equations) The extraction of aluminum- why some metals are extracted with carbon and others by electrolysis. The process of extraction of aluminum. (HT) half equations for the electrolysis of aluminum. Electrolysis of aqueous solutions-Required practical to predict the products of the electrolysis of a aqueous solution. (HT) writing the half equation at each electrode during the electrolysis of an aqueous solution.	Chemistry unit C14- The Earth's resources (paper2) Finite and renewable resources. The uses of natural products that are supplemented by manmade alternatives. Water safe to drink- Potable and wastewater, treatment of salt water and wastewater. Treating wastewater so that it is safe to put back into the environment. (HT) Extracting metals from ores using alternative methods of extraction. Using Life cycle assessments to compare plastic and paper bags. Reduce, reuse and recycle, looking at aluminium and copper.
Spring 1 Assessment:	Chemistry end of unit test – C5 (40 marks) higher and foundation Yr10 Trust Mid year assessment. Trust assessment	

	based on paper 1 content, 30 mins, sat in class, a selection of multiple choice and longer answer questions	
Spring 2	Chemistry unit C7 – Energy changes (paper 1 content) Exothermic and endothermic reactions- distinguish between the two types of reaction based on temperature change. Carry out an investigation into energy changes. Using energy transfers from reactions- to evaluate the uses and applications of exothermic and endothermic reactions. Reaction profiles- draw and label simple reaction profiles, showing activation energy and overall energy change. (HT) understand the energy changes when bonds are broken and when bonds are made. (HT) Bond energy calculations- calculating the energy transferred in chemical reactions when supplied with bond energies. (T) Chemical cells and batteries- linked learning to the reactivity series. Evaluate the use of chemical cells. (T) Fule cells- evaluate the use of hydrogen cells, writing the half equations for the electrode reactions.	Combined science- revision from the beginning of year 9 Triple only- Unit C15- Using our resources (paper 2) Rusting and protection from rusting. Useful alloys and common alloys. The propertied of polymers linked to monomers. Evaluating thermosetting and thermosoftening polymers. Glass, ceramics and composites. Making ammonia in the Haber process. Knowing the raw materials and conditions used in the Haber process. The economics of the Haber process- how the commercially used conditions are linked to the to the availability and cost of the raw materials, energy needed, equilibrium position and rate. Making fertilisers in the lab. Making fertilisers in industry- compare lab and industrial produced fertilisers.

Spring 2 Assessment:	Chemistry end of unit test – C5 (40 marks) higher and foundation	Yr 11 Paper 2 Mock.
Summer 1	Chemistry unit C8- Rates and equilibrium (paper 2 content) Rate of reaction- what is rate, how to calculate rate, calculating mean. (HT) calculating rate at a specific time using a tangent. Collision theory and surface area- factors that affect rate, using collision theory to explain the effect of surface area on reaction rate. The effect of temperature-How increasing temperature affects the rate of reaction. The effect of pressure and concentration- how and why increasing concentration/pressure of reactants in solutions affects rate. The effect of a catalyst-what is a catalyst and why are they important in industry. Reversible reactions and the energy in reversible reactions. Dynamic equilibrium- reversible reactions in a closed system. (HT) Altering conditions - how changing the temp and pressure affects reversible reactions, looking at Le Chateliers principle.	Revision from paper 1 and 2
Summer 1	Chemistry end of unit test – C5 (40 marks) higher and	

Assessment:	foundation	
Summer 2	Chemistry unit C9 – Crude oil and fuels Hydrocarbons-Crude oil and its formation. What are alkanes and the general formula and names and the formula of the first 4 alkanes. Burning hydrocarbons-the products of complete and incomplete combustion, proving the products exist. Carbon monoxide and the dangers. Fractional distillation of oil- how the volatility, viscosity and flammability of hydrocarbons is directly linked to molecule size. Separating crude oil into fractions and how fractions are used. Cracking hydrocarbons- why are hydrocarbons cracked with examples to illustrate.	Revision for paper 1 and 2
Summer 2 Assessment:	Chemistry end of unit test – C5 (40 marks) higher and foundation Year 10 Paper 1 mock. Trust set based on a full paper 1. Sat in the hall at individual exam desks. Combined 70 marks, Triple 100 marks	

What will a student know by the end of each year? Why?	In Quantitative Chemistry students learn to apply a variety of equations, which can be used to work out things such as reacting masses and the atom economy of reactions. Linking this to the sustainability of processes and we apply the knowledge in the context of prior topics then embed it in later topics. The Chemical Changes topic is all about the reactions of acids and metals; students will confidently use the reactivity series to learn how different metals can be extracted depending on their position in the series. The Energy Changes topic develops the concepts taught in Key Stage 3 about exothermic and endothermic reactions, including calculating energy changes in reactions. Students will have knowledge of real-world application of the chemistry involved. Students will know about fuel cells and rechargeable batteries, evaluating the uses for future generations regarding sustainability and practicality. Understanding Rate and Extent of Chemical Change topic which recaps Key Stage 3 content, students will carry out experiments to work out the rate of reactions, and plot graphs using experimental data and tangents to calculate rate, linking yield to rate in industry. They will develop experimental and investigative skills based on correct and safe laboratory techniques. GCSE Chemistry allows students to develop a logical approach to problem solving in a wider context and understand the widespread importance of chemistry	In organic Chemistry which covers organic substances like alkanes, alcohols, esters and amino acids. Students will understand different types of polymerisation, and how this process is linked to DNA. A crucial Bio chem cross curricular link. Chemical Analysis enhances students' knowledge about different techniques for identifying unknown compounds such as chromatography and flame emission spectroscopy. In addition, they learn about the importance of pure substances and formulations within the context of food and pharmaceuticals. Using Resources which is about materials, making water safe and being sustainable in manufacturing using life cycle assessments. Students acquire knowledge and understanding of chemical facts, concepts and principles as well as being able to appreciate the practical nature of chemistry. They will develop experimental and investigative skills based on correct and safe laboratory techniques. GCSE Chemistry allows students to develop a logical approach to problem solving in a wider context and understand the widespread importance of chemistry and how materials are used in the world. The course will teach students how to evaluate, in terms of chemical knowledge and understanding, the benefits and drawbacks of real-life applications of science, including their everyday, industrial and environmental aspects. This process prepares students for more

	and how materials are used in the world. The course will teach students how to evaluate, in terms of chemical knowledge and understanding, the benefits and drawbacks of real-life applications of science, including their everyday, industrial and environmental aspects. This process prepares students for more advanced courses in chemistry and for other courses which require a knowledge of chemistry. Why? These topics develop students' understanding of the fundamental principles that underpin chemistry and their applications in the real world. Students learn to solve quantitative problems, investigate chemical reactions, evaluate sustainability and energy use, and apply scientific knowledge to industrial and environmental contexts. Through experimental work and data analysis, they develop the practical, analytical and problem-solving skills required for success at GCSE and provide a foundation for further study in chemistry and related sciences.	advanced courses in chemistry and for other courses which require a knowledge of chemistry. Why? These topics enable students to deepen their understanding of organic chemistry, analytical techniques and the sustainable use of resources. Students learn how chemistry contributes to advances in medicine, materials, manufacturing and environmental protection, while developing the ability to evaluate scientific evidence and make informed judgements about real-world issues. The knowledge, practical skills and critical thinking developed throughout the course prepare students for GCSE examinations, further scientific study and informed participation in an increasingly scientific and technological world.
Extra-Curricular Opportunities GCSE Chemistry intervention sessions. Trust Science Masterclasses. National competitions and challenges. Independent revision programmes using online learning platforms		

	SUBJECT Long-Term Plan Physics Our Physics curriculum develops students' understanding of the fundamental laws that govern the universe, from forces and energy to electricity, waves and space. Through mathematical reasoning, practical enquiry and scientific modelling, students learn to explain natural phenomena and appreciate how physics underpins technological advancement. We aim to cultivate logical, resilient and inquisitive learners who can apply their knowledge to solve problems, think critically about evidence and recognise the role of physics in shaping the future.	
Key Stage 4 Long-Term Plan	Year 10	Year 11
Autumn 1	Unit P4 Electric Circuits (Paper 1 content) (T) Electric charges and fields- what happens when insulating materials are rubbed together Current and charge- what determines the size of an electric current and calculation of current from charge flow and time Potential difference and resistance- What is potential difference and ohms law Component characteristics- Potential difference versus Current graphs and what they mean for different components Series circuits- What happens to current, potential difference and resistance in a series circuit Parallel circuits- What happens to current, potential difference and resistance in a parallel circuit	P8 Forces in Balance (Paper 2 content) Vectors and Scalars- To know the difference between a vector and scalar and examples of both. Forces between objects- What forces can do and their units. What forces are being exerted when two objects interact Resultant forces- Resultant forces and how they are calculated. Newtons First Law of Motion and (H) free body diagrams Moments at Work- How to calculate the moment of a force and why leavers are force multipliers Leavers and Gears- How levers work as force multipliers and how gears can give a bigger turning effect Centre of Mass- Centre of mass and how to determine the centre of mass of a suspended object (H) Parallelogram of Forces- What is it used for and

		using scale drawings to determine the size and direction of a resultant force (H) resolution of Forces- How to resolve a force and what force diagrams can tell us about and objects equilibrium P9 Motion (Paper 2 content) Speed and distance time graphs- Information shown by distance-time graphs about an objects motion and what the gradient of the line tells us. Velocity and acceleration- The difference between speed and velocity. Calculating acceleration and deceleration. Velocity time graphs- What a velocity-time graphs tells us about an objects motion. Analysing motion graphs- Calculating acceleration forma velocity time graph. (H) Area under a velocity time graph related to distance travelled
Autumn 1 Assessment:	End of unit assessments	End of unit assessments
Autumn 2	Unit P5 Electricity in the Home (Paper 1 content) Alternating current- what is meant by direct and alternating current Cables and plugs- What are the colours and function of	P10 Forces and Motion (Paper 2 content) Force and acceleration- How acceleration of an object depends on the resultant force on the object and the effect of mass on that acceleration. (H) Inertia and

	the wires in a plug Electrical power and potential difference- How power and energy are related Electrical currents and energy transfer- How the energy transferred by a flow of electrical charge is related to potential difference. Appliances and efficiency- How to calculate the energy supplied and the power output of an electrical appliance	inertia mass of an object Weight and Terminal velocity- The difference between weight and mass. What is terminal velocity and the resultant forces on an object at terminal velocity Forces and braking- What is stopping distance. Factors which affect thinking distance and breaking distance. (H) using an equation to calculate deceleration (H) Momentum- How to calculate momentum and how objects behave when they collide in a closed system (Tr) Using conservation of momentum- Why objects which push each other apart move away at different speeds. (Tr) Impact forces- What affects force of impact and how impact force depends on impact time. Using an equation which links force and time (Tr) Safety first- Impact forces and how they can be reduced. What are the safety features built into cars and their function Forces and elasticity- What are elastic objects and how to measure the extension of a spring with varying force. Understanding Hooke's Law
Autumn 2 Assessment:	End of unit assessments	Yr11 Mock paper 1. Trust set paper 1 material, sat in the hall at individual desks. Combined science Physics 70 marks, triple science 100 marks

Spring 1	P7 Radioactivity (Paper1 content) Atoms and radiation- What is a radioactive substance and the different types of radiation emitted by radioactive sources Discovery of the nucleus- How the nuclear model was established using experimental evidence from different scientists Changes in the nucleus- What is an isotope and the changes to the nucleus when an alpha or beta particle are emitted Alpha, Beta and Gamma radiation- Properties of the different types of radiation Activity and half-life- What is meant by half-life and count rate. (H) How to calculate the half-life or count rate (T) Nuclear radiation in medicine- Radioactive isotopes used for medical imaging and destroying cancer cells (T) Nuclear Fission- What is nuclear fission and chain reactions and how they are used in nuclear power stations (T) Nuclear Fusion	(TR) P11 Forces and Pressure (Paper 2 content) Pressure and surfaces- What is pressure and application of the pressure equation Pressure in liquids- How the pressure in a liquid varies with depth and what the pressure at dept depends on. Calculate pressure caused by a liquid column Atmospheric Pressure- How and why atmospheric pressure changes with altitude. How the density of the atmosphere varies with altitude Upthrust and Floatation- What causes upthrust on an object and explain whether an object floats or sinks. (TR) P16 Space Formation of the Solar System- How the solar system is formed and how energy is released in the sun. The life history of a star- The stages of a star the same as our Sun and larger stars. Why supernovas are important in the star lifecycle Planets, satellites and orbits- What forces keep satellites in orbit. How the force and direction of an object in a circular orbit vary as it moves. The expanding universe- What is meant by red shift and how thit relates to movement of galaxies in the universe. The evidence it provides for an expanding universe. Beginning and future of the universe- Big Bang theory and why the universe is expanding.

Spring 1 Assessment:	Yr10 Trust Mid year assessment. Trust assessment based on paper 1 physics content, 30 mins, sat in class, a selection of multiple choice and longer answer questions	End of unit assessments
Spring 2	P12 Wave Properties (Paper 2 content) The nature of waves- difference between longitudinal and transverse waves Properties of waves- Amplitude, frequency, time period and wavelength. How are these related to each other and wave speed Reflection and refraction- How waves behave when the hit or cross a boundary between two different materials. Using a ripple tank to study waves More about waves- Investigating waves on a string Tr Sound waves- Loudness and pitch, how are waves detected by the ear. Tr Uses of ultrasound- Uses in medicine and industry Tr Seismic waves- What are they, how are they produced and what information they give about the structure of the Earth	Revision and past paper question practices
Spring 2 Assessment:	End of unit assessments	Yr 11 Paper 2 Mock.

Summer 1	P13 Electromagnetic Waves (Paper 2 content The Electromagnetic Spectrum- What are the parts of the spectrum and how are frequency and wavelength related. Radio waves, Microwaves and Light waves- What are their properties and uses Communications- How radio and microwaves are used for communications. Uses of fibre optic cables. (H) Carrier waves Ultraviolet, X-rays and Gamma rays- What are their properties and uses. What is ionising radiation and how can it be harmful X-rays in medicine- What are x-rays used for, how they interact with the body. (Tr) P14 Light (Paper 2 content) Reflection of light- Law of reflection, how an image is formed by a plane mirror and types of reflection Refraction of light- When this occurs and how the light rays refract at a boundary between objects Light and Colour- What determines colour of an object and difference between transparent and translucent Lenses- Ray diagrams for convex and concave lenses, magnification calculation Using lenses- What is the image formed by a convex or concave lens and how this can be used in cameras and magnifying lenses.	

Summer 1 Assessment:	End of unit assessments	
Summer 2	P15 Electromagnetism (Paper 2 content) Magnetic fields- The pattern of field lines around a bar magnet and induced magnetism Magnetic fields of electric currents- Pattern of a magnetic field around a wire and solenoid. How to change the strength of an electromagnet Electromagnets in devices- Uses of electromagnets and how devices work which use electromagnets The motor effect- Understand how a force is exerted on a current carrying wire in a magnetic field. (H) Magnetic flux density and calculating force exerted on wire. Basis of an electric motor (Tr) The generator effect- What is the generator effect, how a potential difference can be induced in a wire and varying the size of the induced potential difference. (Tr) Alternating current generator- How a simple alternator and dynamo are constructed and operated. How the induced potential difference varies with time. (Tr) Transformers- How a transformer works and how it is constructed. What are step up and step down transformers used for. (Tr) Transformers in action- How the number of turns	

	of wire on the primary and secondary coils is related to the potential difference. How the number of turns on each coil is related to a step up or down transformer.	
Summer 2 Assessment:	Year 10 Paper 1 mock. Trust set based on a full paper 1. Sat in the hall at individual exam desks. Combined 70 marks, Triple 100 marks	
What will a student know by the end of each year? Why?	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 sustainable future? Ionising radiation is hazardous but can be very useful.	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. Wave behaviour is common 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. Electromagnetic effects are used in a wide variety of devices. Engineers make use of the fact that a magnet

	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. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation. Students will develop experimental and investigative skills based on correct and safe laboratory techniques. GCSE Physics allows students to develop a logical approach to problem solving in a wider context and understand the widespread importance of physics and how materials are used in the world. The course will teach students how to evaluate, in terms of physics knowledge and understanding, the benefits and drawbacks of real-life applications of science, including their everyday, industrial and environmental aspects. This process prepares students for more advanced courses in physics and for other courses which require a knowledge of physics. Why? These topics develop students' understanding of electricity, energy and atomic structure, helping them explain how physics underpins modern technology, energy production and sustainability. Students also	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. Students will develop experimental and investigative skills based on correct and safe laboratory techniques. GCSE Physics allows students to develop a logical approach to problem solving in a wider context and understand the widespread importance of physics and how materials are used in the world. The course will teach students how to evaluate, in terms of physics knowledge and understanding, the benefits and drawbacks of real-life applications of science, including their everyday, industrial and environmental aspects. This process prepares students for more advanced courses in physics and for other courses which require a knowledge of physics. Why? These topics deepen students' understanding of forces, waves and electromagnetism, showing how physics is applied in engineering, communications and everyday life. Students develop analytical, investigative and evaluative skills that prepare them for GCSE examinations and further study.

	build the practical, mathematical and problem-solving skills needed for GCSE success.	
Extra-Curricular Opportunities GCSE Physics intervention sessions. Trust Science Masterclasses. National competitions and challenges. Independent revision programmes using online learning platforms		