Science	*Term 1*	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Year 7	**Being a scientist** • Why is science important? • What equipment do we use in science? • How do we safely use equipment in science? • What skills do we need to be a scientist? **You and your body** • What are cells? • How are cells linked to organs? • Why are organ systems important? • What are the roles of the skeleton and muscles? **Particles in action** • What are the properties of solids, liquids and gases? • Why do changes of state occur? • What is diffusion? • Why do substances expand on heating? • What happens during dissolving?		**Use the force** • What are forces? • What are the effects of air resistance? • Why is friction important? • What is the relationship between mass, weight and gravity? • How do we calculate speed? **What makes you, you?** • Which cells are involved in fertilisation and how are they adapted? • Where does fertilisation take place? • What are the stages of development in the womb? • Why do we look similar to but not the same as our parents? • How does the environment affect what we are like? **Elements and compounds** • What are elements? • What is the periodic table? • What are the alkali metals? • What are the halogens? • What are the noble gases? • How are compounds made?		**Plants** • What is the structure of a plant? • How do plants reproduce? • What do plants need to grow? • How can we help plants to grow? • What are the problems associated with fertilisers? **Electrifying** • How do we draw electrical circuits? • What is current? • What is voltage? • What are magnets? • What is an electromagnet? • How can we make an electromagnet stronger? **Chemical reactions** • What is the difference between a chemical reaction and a physical change? • What is combustion? • How is mass conserved in a chemical reaction? • What are exothermic and endothermic reactions? • What are acids and alkalis? • How do we test for acids and alkalis? • How do acids react with metals?	

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 8	**Staying alive** • What is respiration? • How does exercise affect respiration? • What is the structure of the heart and lungs? • What makes a healthy diet? • How does our body break down food? **Energy and energy transfers** • What are the different types of energy? • How is energy transferred? • How were fossil fuels formed? • What are the advantages of using renewable energy sources? • How is heat transferred by conduction, convection and radiation? **Ecology** • What must a habitat provide? • How are some animals adapted to their environment? • What do food chains and webs tell us? • What is the difference between a pyramid of number and a pyramid of biomass? • How do we classify animals?		**Magnificent metals** • What are the typical properties of metals? • What is produced when metals, metal oxides and metal carbonates react with an acid? • What is the reactivity series and why is it important? • What are displacement reactions? • How are metals extracted from their ores? **The Earth and beyond** • How are sedimentary, igneous and metamorphic rocks formed? • What is the rock cycle? • What is the structure of the earth? • Why do we have day, night and seasons? • What do we know about the planets of the solar system? **See it, hear it** • How does light reflect, refract and disperse? • What do we know about light and colour? • What is sound? • How do we use an oscilloscope to “see” sounds? • What are echoes?		**Healthy living** • What are microbes? • How does our body protect us from infection? • What is artificial immunity? • What problems are there with the use of antibiotics? • How do drugs affect the body? **Moving around** • How do levers make work easier? • How do we calculate moments? • How can we investigate a pendulum? • What is circular motion? • What is terminal velocity? • What is the science behind a roller coaster?	

Year9 – all students follow the same course in Year nine

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 9	**B1 you and your Genes** • What is the genome and what does it do? • How is genetic information inherited? • How can and should gene technology be used? **C1 Air and Water** • How has the earth's atmosphere changed over time, and why? • Why are there temperature changes in chemical reactions? • What is the evidence for climate change and why is it changing? • How can Scientists help improve the supply of potable water? **P1Radiation and Waves** • What are the risks and benefits of using radiation? • What is climate change and what is the evidence for it? • How do waves behave? • What happens when light and sound meet different materials?		**B2 Keeping healthy** • What are the causes of disease? • How do organisms protect themselves against pathogens? • How can we prevent the spread of infection? • How can we identify the cause of an infection? • How can lifestyle, genes and the environment affect my health? • How can we treat disease? **C2 Chemical Patterns** • How have our ideas about atoms developed over time? • What does the periodic table tell us about the elements? • How do metals and non-metals combine to form compounds? • How are equations used to represent chemical reactions? • What are the properties of transition metals? **P2 Sustainable energy** • How much energy do we use? • How can electricity be generated?		**B3 Living together – Food and ecosystems** • What happens during photosynthesis? • How do producers get the substances they need? • How are organisms in an ecosystem interdependent? • How are populations affected by conditions in an ecosystem? **C3 Chemicals of the natural environment** • How are the atoms held together in a metal? • How are metals of different reactivity extracted? • What are electrolytes and what happens during electrolysis? • Why is crude oil important as a source of new materials? **P3 Electric circuits** • What is electric charge? • What determines the current in an electric circuit? • How do series and parallel circuits work? • What determines the rate of energy transfer in a circuit? • What are magnetic fields?	

			• How do electric motors work? • What is the process inside an electric generator?

Year 10 Top sets follow separate science course (three GCSEs), lower sets follow combined science (two GCSEs)

	Term 1	***Term 2***	***Term 3***	***Term 4***	***Term 5***	***Term 6***
Year 10	**B4 Using food and controlling growth** • What happens during cellular respiration? • How do we know about mitochondria and other cell structure? • How do organisms grow and develop? • *How is plant growth controlled? (Separate only)* • Should we use stem cells to treat damage and disease? **C4 Material choices?** • How is data used to choose a material foe a particular use? • *What are the different types of polymer? (Separate only)* • How do bonding and structure affect properties of materials? • Why are nanoparticles so useful? • What happens to products at the end of their useful life? **P4 Explaining motion** • What are forces? • How can we describe motion? • What is the connection between force and motion? • How can we describe motion in terms of energy transfers?			**B5 The human body – staying alive** • How do substances get into, out of and around our bodies? • How does the nervous system help us respond to changes? • How do hormones control responses in the human body? • Why do we need to maintain a constant internal environment? • What roles do hormones play in human reproduction? • What can happen when organs and control systems stop working? **C5 Chemical analysis** • How are chemical separated and tested for purity? • *How do chemists find the composition of unknown samples? (separate only)* • How are the amounts of substances in reactions calculated? • How are the amounts of chemicals in solutions measured? **P5 Radioactive materials** • What is radioactivity? • How can radioactive materials be used safely? • *How can radioactive materials be used to provide energy? (Separate only)*		

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 11	**<u>B6 Life on Earth – past, present and future</u>** • How was the theory of evolution developed? • *How do sexual and asexual reproduction affect evolution (Separate only)* • How does our understanding of biology help us to classify the diversity of organisms on Earth? • How is biodiversity threatened and how can we protect it? **<u>C6 Making useful chemicals</u>** • What useful products can be made from acids? • How do chemists control the rate of reactions? • What factors affect the yield of chemical reactions? • *How are chemical reactions made on an industrial scale? (Separate only)* **<u>P6 Matter – models and explanations</u>** • How does energy transform matter? • How does the particle model explain the effect of heating? • How does the particle model relate to material under stress? • *How does the particle model relate to pressure in fluids? (Separate only)* • *How can scientific models help us to understand the Big Bang? (Separate only)*		**<u>Unit 7 Ideas about science</u>** • What needs to be considered when investigating a phenomenon scientifically? • What conclusions can we make from data? • How are scientific explanations developed? • How do science and technology impact on society? **Unit 8 Practical Skills** **<u>Mathematical skills review</u>** • Arithmetic and numerical computation • Handling data • Algebra • Graphs • Geometry and trigonometry		REVISION AND EXAMS	REVISION AND EXAMS

A level Biology

	Term 1	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Year 12	**Module one – Development of practical skills in biology** **Module two – Foundation in biology** • Cell structure • Biological Molecules • Nucleic acids • Enzymes • Biological membranes • Cell division, cell diversity and cell differentiation **Module three – Exchange and transport** • Exchange surfaces and breathing • Transport in animals • Transport in plants			**Module one – Development of practical skills in biology** **Module four – Biodiversity, Evolution and disease** • Communicable diseases • Biodiversity • Classification and evolution		**Module one – Development of practical skills in biology** **Revision and end of year assessment**

	Term 1	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Year 13	**Module one – Development of practical skills in biology** **Module five – Communication, homeostasis and energy** • Communication and homeostasis • Excretion as an example of homeostatic control		**Module one – Development of practical skills in biology** **Module five – Communication, homeostasis and energy** • Plant and animal responses • Photosynthesis • Respiration		**Module one – Development of practical skills in biology** **Revision and exams**	

	• Neuronal communication • Hormonal communications **<u>Module six – Genetics and ecosystems</u>** • Cellular control • Patterns of inheritance • Manipulating genomes	**<u>Module six – Genetics and ecosystems</u>** • Cloning and biotechnology • Ecosystems • Populations and sustainability	

<u>A level Chemistry</u>

	Term 1	***Term 2***	***Term 3***	***Term 4***	***Term 5***	***Term 6***
Year 12	**Module 1:** Development of Practical Skills in Chemistry **Module 2:** Foundations in Chemistry Mock Exam in October	**Module 1:** Development of Practical Skills in Chemistry **Module 2:** Foundations in Chemistry	**Module 1:** Development of Practical Skills in Chemistry **Module 3:** Periodic Table and Energy Module 4 :Core Organic Chemistry	**Module 1:** Development of Practical Skills in Chemistry **Module 3:** Periodic Table and Energy Module 4 :Core Organic Chemistry	**Module 3:** Periodic Table and Energy **Module 4 :** Core Organic Chemistry	**Start Modules 5** : Physical Chemistry and Transition Elements and **Module 6:** Organic Chemistry and Analysis.

	Term 1	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Year 13	**Module 5:** Rate Equations, Orders of reaction and Equilibria. **Module 6:** Aromatic compounds, carboxylic acids and esters	**Module 5:** pH, buffer solutions, lattice enthalpy and Born-Haber cycles **Module 6:** Amines and amino acids, polymerisation	**Module 5:** Entropy and free energy, electrochemical cells. **Module 6:** synthetic organic chemistry	**Module 5:** Redox and transition elements **Module 6:** Modern analytical techniques	Further development of practical skills. Synopsis	

A level Physics

	Term 1	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Year 12	**Module 1 – Development of practical skills in physics** 1.1 Practical skills assessed in a written examination	**Module 3 – Forces and motion** 3.1 Motion 3.2 Forces in action	**Module 3 – Forces and motion** 3.2 Forces in action 3.3 Work, energy and power	**Module 3 – Forces and motion** 3.3 Work, energy and power 3.4 Materials 3.5 Newton's laws	**Module 3 – Forces and motion** 3.5 Newton's laws of motion **Module 4 –**	**Module 5 – Newtonian world and astrophysics** 5.1 Thermal physics 5.2 Circular motion 5.3 Oscillations

	1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities **Module 3 – Forces and motion** 3.1 Motion **Module 4 – Electrons, waves and photons**	**Module 4 – Electrons, waves and photons** 4.1 Charge and current 4.2 Energy, power and resistance 4.3 Electrical circuits **Module 1 – Development of practical skills in physics** 1.1 Practical skills assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of**	3.4 Materials **Module 4 – Electrons, waves and photons** 4.3 Electrical circuits 4.4 Waves **Module 1 – Development of practical skills in physics** 1.1 Practical skills assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics**	of motion **Module 4 – Electrons, waves and photons** 4.3 Electrical circuits 4.4 Waves 4.5 Quantum physics **Module 1 – Development of practical skills in physics** 1.1 Practical skills assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 –**	**Electrons, waves and photons** 4.5 Quantum physics	

	4.1 Charge and current 4.2 Energy, power and resistance	**physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities	2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities	**Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities		

	Term 1	***Term 2***	***Term 3***	***Term 4***	***Term 5***	***Term 6***
Year 13	**Module 5 - Newtonian world and astrophysics** 5.4 Gravitational fields 5.5 Astrophysics and cosmology **Module 1 – Development of practical skills in**	**Module 6 – Particles and medical physics** 6.1 Capacitors 6.2 Electric fields **Module 1 – Development of practical skills in physics** 1.1 Practical skills	**Module 6 – Particles and medical physics** 6.3 Electromagnetism 6.4 Nuclear and particle physics **Module 1 – Development of practical skills in**	**Module 6 – Particles and medical physics** 6.5 Medical imaging **Module 1 – Development of practical skills in physics** 1.1 Practical skills	**Revision and preparation for final exam papers**	**Final revision and preparation for final exam papers**

	physics 1.1 Practical skills assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities	assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities	**physics** 1.1 Practical skills assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities	assessed in a written examination 1.2 Practical skills assessed in the practical endorsement **Module 2 – Foundations of physics** 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities		