Science

Curriculum Overview	Curriculum Enriching Opportunities	Links To The National Curriculum

Curriculum Overview

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7 Topic Content Plus Skills (AO)	Introduction to Science & Safety in the lab. Constructing Hypothesis & Variables Methods and Equipment Conducting an experiment Measurements and SI units Drawing Graphs and Tables Interpreting graphs and making conclusions Scientific attitudes Cells and microscopy.	Movement, Particle Theory, Diffusion Atoms, Separating Mixtures	Contact Forces Gravity	Elements The Periodic Table Variation Plant Reproduction	Human Reproduction Energy Transfers Chemical Energy	Acids and Alkalis The Universe
7 Assessment	Baseline assessment of science skills learnt during term 1.	End of term assessment, covering content and skills learnt in term 1 and term 2.	End of term assessment, covering content and skills learnt in term 3.	End of term assessment, covering content and skills learnt in term 4.	End of term assessment, covering content and skills learnt in term 5.	End of year assessment, covering knowledge and skills learnt during terms 1 to 6.

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8 Topic Content Plus Skills (AO)	Energy transfers in a system. Efficiency. Atomic structure. Cell structure. Cell division. DNA	Waves. Structure of the Earth. The rock cycle. Gas exchange in animals and plants. The effects of lifestyle on some non-communicable diseases.	Force and motion. Strong and weak acids. Respiration. Specialised cells.	Electrical circuits. Energy resources. Factors affecting the rate of chemical reactions. Evolution. Fossils and Extinction.	Particle model and changes of state. Crude oil - Formation, Uses and Environmental effects. DNA and genetic inheritance.	The Earth and the universe. The Earth and its atmosphere. Ecosystems. Cycles in nature.
8 Assessment	Baseline assessment of science investigative skills	End of term assessment, covering content and skills learnt in term 1 and term 2.	End of term assessment, covering content and skills learnt in term 3.	End of term assessment, covering content and skills learnt in term 4.	End of term assessment, covering content and skills learnt in term 5.	End of year assessment, covering knowledge and skills learnt during terms 1 to 6.
9 Topic Content Plus Skills (AO)	Cell Biology Atomic Structure	Atomic Structure Energy	Energy	Structures and Bonding AQA Big Practical week and British Science Week	Organisation	Electricity
9 Assessment	Baseline assessment of science investigative skills	End of term assessment, covering content and skills learnt in term 1 and term 2.	End of term assessment, covering content and skills learnt in term 3.	End of term assessment, covering content and skills learnt in term 4.	End of term assessment, covering content and skills learnt in term 5.	GCSE Readiness Assessment (AQA)
10 Topic Content Plus Skills (AO)	Atomic Bonding Energy	Electricity Infection and Response	Bioenergetics Quantitative Chemistry	Chemical Changes Particle Model of Matter and Atomic Structure	Ecology Energy Changes, the Rate and Extent of Chemical Change, Chemical Analysis	Forces

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10 Assessment	Baseline assessment of knowledge learnt in Y9.	End of term assessment, covering content and skills learnt in term 1 and term 2.	End of term assessment, covering content and skills learnt in term 3.	End of term assessment, covering content and skills learnt in term 4.	End of term assessment, covering content and skills learnt in term 5.	Mock Exams covering Paper 1 topics
11 Topic Content Plus Skills (AO)	Homeostasis and Response Organic Chemistry	Waves Magnetism and Electromagnetism	Inheritance, Variation and Evolution Chemistry of the Atmosphere and Using Resources	Revision.	Revision and Exams.	
11 Assessment	End of term assessment, covering content and skills learnt in term 1.	Mock exams covering content learnt in Y10 for Biology 1, Chemistry 1 and Physic 1	End of term assessment, covering content and skills learnt in term 1 and term 2.	Mock exams covering content learnt in Y11 for Biology 2, Chemistry 2 and Physic 2		

Curriculum Enriching Opportunities

Curriculum Enriching Opportunities					
	Year 7	**Year 8**	**Year 9**	**Year 10**	**Year 11**

Science

Suggested Reading	★ BBC Bitesize KS3	★ BBC Bitesize KS3	★ BBC Bitesize KS3	★ CGP Revision guides (AQA Trilogy/ Separate Sciences)	★ CGP Revision guides (AQA Trilogy/ Separate Sciences)
Suggested Viewing	★ BBC Bitesize KS3 ★ Operation Ouch (Youtube) ★ CrashCourse Kids (Youtube) ★ Oak National Academy	★ BBC Bitesize KS3 ★ Operation Ouch (Youtube) ★ CrashCourse Kids (Youtube) ★ Oak National Academy	★ BBC Bitesize KS3 ★ Operation Ouch (Youtube) ★ CrashCourse Kids (Youtube) ★ Oak National Academy	★ BBC Bitesize KS4, AQA Trilogy ★ GCSEpod ★ Down to Earth with Zac Efron (Netflix) ★ FreeScienceLessons.com Tassomai	★ BBC Bitesize KS4, AQA Trilogy ★ GCSEpod ★ Down to Earth with Zac Efron (Netflix) ★ FreeScienceLessons.com ★ Tassomai
Cultural Capital Experiences	★ Regional and National STEM competitions ★ British Science Week ★ The Science of Fireworks	★ Regional and National STEM competitions ★ LifeLab ★ British Science Week ★ Medical Marvels	★ Lifelab trip ★ Big Bang Roadshow ★ Regional and National STEM competitions ★ British Science Week	★ RHS Wisely Photosynthesis workshop trip ★ Big Bang Roadshow ★ British Science Week	★ Big Bang Roadshow ★ British Science Week

Science

Links To The National Curriculum - Biology - Chemistry - Physics

Science National Curriculum Key Stage 3	Term Covered
WORKING SCIENTIFICALLY	
Scientific Attitudes	
Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility	All terms Y7, Y8 and Y9.
Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review	All terms Y7, Y8 and Y9.
Evaluate risks	All terms Y7, Y8 and Y9.

Experimental skills and strategies

Science

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience	All terms Y7, Y8 and Y9.
Make predictions using scientific knowledge and understanding	All terms Y7, Y8 and Y9.
Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate	All terms Y7, Y8 and Y9.
Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety	All terms Y7, Y8 and Y9.
Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements	All terms Y7, Y8 and Y9.
Apply sampling techniques	All terms Y7, Y8 and Y9.

Analysis and evaluation	
Apply mathematical concepts and calculate results	All terms Y7, Y8 and Y9.

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Present observations and data using appropriate methods, including tables and graphs	All terms Y7, Y8 and Y9.
Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	All terms Y7, Y8 and Y9.
Present reasoned explanations, including explaining data in relation to predictions and hypotheses	All terms Y7, Y8 and Y9.
Evaluate data, showing awareness of potential sources of random and systematic error	All terms Y7, Y8 and Y9.
Identify further questions arising from their results.	All terms Y7, Y8 and Y9.

Measurement	
Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature	All terms Y7, Y8 and Y9.
Use and derive simple equations and carry out appropriate calculations	All terms Y7, Y8 and Y9.

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Undertake basic data analysis including simple statistical techniques.	All terms Y7, Y8 and Y9.

BIOLOGY	
Cells and organisation	
Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope	Term 2 Y7, Term 1 Y8 Term 1 Y9
The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts	Term 2 Y7, Term 1 Y8 Term 1 Y9
The similarities and differences between plant and animal cells	Term 2 Y7, Term 1 Y8 Term 1 Y9
The role of diffusion in the movement of materials in and between cells	Term 2 Y7, Term 1 Y8 Term 1 Y9
The structural adaptations of some unicellular organisms	Term 2 Y7, Term 1 Y8 Term 1 Y9
The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.	Term 2 Y7, Term 1 Y8

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	Term 1 Y9
The Skeletal and Muscular Systems	
The structure and functions of the human skeleton, to include support, protection, movement and making blood cells	Term 3 Y7
Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles	Term 3 Y7
The function of muscles and examples of antagonistic muscles	Term 3 Y7
Nutrition and digestion	
Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed	Term 4 Y7, Term 3 Y9
Calculations of energy requirements in a healthy daily diet	Term 4 Y7, Term 3 Y9
The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases	Term 4 Y7, Term 3 Y9
The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)	Term 4 Y7, Term 3 Y9

The importance of bacteria in the human digestive system	Term 4 Y7, Term 3 Y9
Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots	Term 4 Y7, Term 3 Y9

Gas Exchange Systems	
The structure and functions of the gas exchange system in humans, including adaptations to function	Term 3 Y7, Term 2 Y8
The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume	Term 3 Y7, Term 2 Y8
The impact of exercise, asthma and smoking on the human gas exchange system	Term 3 Y7, Term 2 Y8
The role of leaf stomata in gas exchange in plants	Term 3 Y7, Term 2 Y8
Reproduction	
Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta	Year 7 Term 5, Year 9 Term 5

Science

Health	
The effects of recreational drugs (including substance misuse) on behaviour, health and life processes	Term 4 Y7, Term 2 Y8

Photosynthesis	
The reactants in, and products of, photosynthesis, and a word summary for photosynthesis	Term 6 Y7
The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere	Term 6 Y7
The adaptations of leaves for photosynthesis	Term 6 Y7
Cellular Respiration	
Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life	Term 2 Y7, Term 3 Y8
A word summary for aerobic respiration	Term 2 Y7, Term 3 Y8

Science

The process of anaerobic respiration in humans and microorganisms, including fermentation, and a word summary for anaerobic respiration	Term 2 Y7, Term 3 Y8
The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	Term 2 Y7, Term 3 Y8
Relationships in an ecosystem	
The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops	Term 6 Y8, Term 6 Y9
The importance of plant reproduction through insect pollination in human food security	Term 6 Y8, Term 6 Y9
How organisms affect, and are affected by, their environment, including the accumulation of toxic materials	Term 6 Y8, Term 6 Y9

Inheritance, chromosomes, DNA and genes

Science

Heredity as the process by which genetic information is transmitted from one generation to the next	Term 5 Y9
A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model	Term 5 Y9
Differences between species	Term 5 Y9
The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation	Term 5 Y9
The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection	Term 5 Y9
Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction	Term 5 Y9
The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material	Term 5 Y9
CHEMISTRY	

Science

The particulate nature of matter	
The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure	Term 2 Y7, Term 1 Y8
Changes of state in terms of the particle model.	Term 2 Y7, Term 1 Y8

Atoms, Elements and Compounds	
A simple (Dalton) atomic model	Term 2 Y7, Term 1 Y8
Differences between atoms, elements and compounds	Term 2 Y7, Term 1 Y8
Chemical symbols and formulae for elements and compounds	Term 2 Y7, Term 1 Y8
Conservation of mass changes of state and chemical reactions	Term 2 Y7, Term 1 Y8
Pure and Impure substances	

Science

The concept of a pure substance	Term 2 Y7
Mixtures, including dissolving	Term 2 Y7
Diffusion in terms of the particle model	Term 2 Y7
Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography	Term 2 Y7
The identification of pure substances	Term 2 Y7

Chemical Reactions	
Chemical reactions as the rearrangement of atoms	Term 2-5 Y9
Representing chemical reactions using formulae and using equations	Term 2-5 Y9
Combustion, thermal decomposition, oxidation and displacement reactions	Term 2-5 Y9
Defining acids and alkalis in terms of neutralisation reactions	Term 2-5 Y9

Science

The pH scale for measuring acidity/alkalinity; and indicators	Term 2-5 Y9
Reactions of acids with metals to produce a salt plus hydrogen	Term 2-5 Y9
Reactions of acids with alkalis to produce a salt plus water	Term 2-5 Y9
What catalysts do	Term 2-5 Y9
Energetics	
Energy changes on changes of state (qualitative)	Term 5 Y9
Exothermic and endothermic chemical reactions (qualitative)	Term 5 Y9
The Periodic Table	
The varying physical and chemical properties of different elements	Term 1 Y9
The principles underpinning the Mendeleev Periodic Table	Term 1 Y9

Science

The Periodic Table: periods and groups; metals and non-metals	Term 1 Y9
How patterns in reactions can be predicted with reference to the Periodic Table	Term 1 Y9
The properties of metals and non-metals	Term 1 Y9
The chemical properties of metal and non-metal oxides with respect to acidity	Term 1 Y9
Materials	
The order of metals and carbon in the reactivity series	Term 4 Y9
The use of carbon in obtaining metals from metal oxides	Term 4 Y9
Properties of ceramics, polymers and composites (qualitative)	Term 4 Y9
Earth and atmosphere	
The composition of the Earth	Term 6 Y8

Science

The structure of the Earth	Term 6 Y8
The rock cycle and the formation of igneous, sedimentary and metamorphic rocks	Term 6 Y8
Earth as a source of limited resources and the efficacy of recycling	Term 6 Y8
The carbon cycle	Term 6 Y8
The composition of the atmosphere	Term 6 Y8
The production of carbon dioxide by human activity and the impact on climate	Term 6 Y8

PHYSICS	
Calculation of fuel uses and costs in the domestic context	
Comparing energy values of different foods (from labels) (kJ)	Term 1 Y8
Comparing power ratings of appliances in watts (W, kW)	Term 1 Y8

Science

Comparing amounts of energy transferred (J, kJ, kW hour)	Term 1 Y8
Domestic fuel bills, fuel use and costs	Term 1 Y8
Fuels and energy resources	Term 1 Y8
Energy changes and transfers	
Simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged	Term 1 Y8
Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators	Term 1 Y8
Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels	Term 1 Y8
Changes in Systems	
Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change	Term 1 Y8

Science

Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions	Term 1 Y8
Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes	Term 1 Y8

Describing motion	
Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)	Term 3 Y8
The representation of a journey on a distance-time graph	Term 3 Y8
Relative motion: trains and cars passing one another	Term 3 Y8
Forces	

Science

Forces as pushes or pulls, arising from the interaction between two objects	Term 1 Year 7
Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces	Term 1 Year 7
Moment as the turning effect of a force	Term 1 Year 7
Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water	Term 1 Year 7
Forces measured in newtons, measurements of stretch or compression as force is changed	Term 1 Year 7
Force-extension linear relation; Hooke's Law as a special case	Term 1 Year 7
Work done and energy changes on deformation	Term 1 Year 7
Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity	Term 1 Year 7
Pressure in fluids	

Science

Atmospheric pressure, decreases with increase of height as weight of air above decreases with height	Term 3 Y9
Pressure in liquids, increasing with depth; upthrust effects, floating and sinking	Term 3 Y9
Pressure measured by ratio of force over area – acting normal to any surface	Term 3 Y9
Balanced Forces	
Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface	Term 3 Y7

Forces and Motion	
Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)	Term 3 Y8
Change depending on direction of force and its size	Term 3 Y8
Observed Waves	

Science

Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition	Term 2 Y8, Term 1 Y9
Sound waves	Term 2 Y8, Term 1 Y9
Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound	Term 2 Y8, Term 1 Y9
Sound needs a medium to travel, the speed of sound in air, in water, in solids	Term 2 Y8, Term 1 Y9
Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal	Term 2 Y8, Term 1 Y9
Auditory range of humans and animals	Term 2 Y8, Term 1 Y9
Energy and waves	Term 2 Y8, Term 1 Y9
Pressure waves transferring energy; use for cleaning and physiotherapy by ultrasound; waves transferring information for conversion to electrical signals by microphone	Term 2 Y8, Term 1 Y9
Light waves	

Science

The similarities and differences between light waves and waves in matter	Term 2 Y8, Term 1 Y9
Light waves travelling through a vacuum; speed of light	Term 2 Y8, Term 1 Y9
The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface	Term 2 Y8, Term 1 Y9
Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye	Term 2 Y8, Term 1 Y9
Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras	Term 2 Y8, Term 1 Y9
Current Electricity	
Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge	Term 4 Y7, Term 4 Y8, Term 4 Y9
Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current	Term 4 Y7, Term 4 Y8, Term 4 Y9
Differences in resistance between conducting and insulating components (quantitative)	Term 4 Y7, Term 4 Y8, Term 4 Y9

Science

Static electricity	
Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects	Term 4 Y7, Term 4 Y8, Term 4 Y9
The idea of electric field, forces acting across the space between objects not in contact	Term 4 Y7, Term 4 Y8, Term 4 Y9
Magnetism	
Magnetic poles, attraction and repulsion	Term 4 Y7
Magnetic fields by plotting with compass, representation by field lines	Term 4 Y7
Earth's magnetism, compass and navigation	Term 4 Y7
The magnetic effect of a current, electromagnets, D.C. motors (principles only)	Term 4 Y7
Physical Changes	
Conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving	Term 5 Y8

Science

Similarities and differences, including density differences, between solids, liquids and gases	Term 5 Y8
Brownian motion in gases	Term 5 Y8
Diffusion in liquids and gases driven by differences in concentration	Term 5 Y8
The difference between chemical and physical changes	Term 5 Y8
Particle model	
The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition	Term 5 Y8
Atoms and molecules as particles	Term 5 Y8
Energy in Matter	
Changes with temperature in motion and spacing of particles internal energy stored in materials	Term 5 Y7
Space Physics	

Science

Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)	Term 6 Y7 Term 6 Y8
Our Sun as a star, other stars in our galaxy, other galaxies	Term 6 Y7 Term 6 Y8
The seasons and the Earth’s tilt, day length at different times of year, in different hemispheres	Term 6 Y7 Term 6 Y8
The light year as a unit of astronomical distance	Term 6 Y7 Term 6 Y8

Science

Science National Curriculum Key Stage 4	Term Covered
WORKING SCIENTIFICALLY	
The development of scientific thinking	
The ways in which scientific methods and theories develop over time	Y10 T2 T4 Y11 T1 T2
Using a variety of concepts and models to develop scientific explanations and understanding	All terms both years
Appreciating the power and limitations of science and considering ethical issues which may arise	Y10 T2 T4 T5 Y11 T2
Explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments	Y10 T5 T6 Y11 T1 T2
Evaluating risks both in practical science and the wider societal context, including perception of risk	All terms both years
Recognising the importance of peer review of results and of communication of results to a range of audiences	Y10 T2 T6

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	Y11 T2
Experimental skills and strategies	
Using scientific theories and explanations to develop hypotheses	All terms both years
Planning experiments to make observations, test hypotheses or explore phenomena	All terms both years
Applying a knowledge of a range of techniques, apparatus, and materials to select those appropriate both for fieldwork and for experiments	All terms both years
Carrying out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations	All terms both years
Recognising when to apply a knowledge of sampling techniques to ensure any samples collected are representative	Y10 T6
Making and recording observations and measurements using a range of apparatus and methods	All terms both years
Evaluating methods and suggesting possible improvements and further investigations	All terms both years

Science

Analysis and evaluation	
Applying the cycle of collecting, presenting and analysing data, including:	All terms both years
Presenting observations and other data using appropriate methods	All terms both years
Translating data from one form to another	All terms both years
Carrying out and representing mathematical and statistical analysis	All terms both years
Representing distributions of results and making estimations of uncertainty	All terms both years
Interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions	All terms both years
Presenting reasoned explanations, including relating data to hypotheses	All terms both years
Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error	All terms both years

Communicating the scientific rationale for investigations, including the methods used, the findings and reasoned conclusions, using paper-based and electronic reports and presentations	All terms both years
Vocabulary, units, symbols and nomenclature	
Developing their use of scientific vocabulary and nomenclature	All terms both years
Recognising the importance of scientific quantities and understanding how they are determined	All terms both years
Using SI units and IUPAC chemical nomenclature unless inappropriate	All terms both years
Using prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano)	All terms both years

Interconverting units	All terms both years
Using an appropriate number of significant figures in calculations	All terms both years
BIOLOGY	

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Cell biology	
Cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells	Y10 T1 Y11 T1
Stem cells in animals and meristems in plants	Y11 T1
Enzymes	Y11 T3
Factors affecting the rate of enzymatic reactions	Y11 T3
The importance of cellular respiration; the processes of aerobic and anaerobic respiration	Y10 T1
Carbohydrates, proteins, nucleic acids and lipids as key biological molecules	Y10 T3 Y11 T3
Transport systems	
The need for transport systems in multicellular organisms, including plants	Y10 T1 T4

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The relationship between the structure and functions of the human circulatory system	Y10 T1
Health, disease and the development of medicines	
The relationship between health and disease	Y10 T1 T2
Communicable diseases including sexually transmitted infections in humans (including HIV/AIDs)	Y10 T2
Non-communicable diseases	Y10 T1 T2
Bacteria, viruses and fungi as pathogens in animals and plants	Y10 T2
Body defences against pathogens and the role of the immune system against disease	Y10 T2
Reducing and preventing the spread of infectious diseases in animals and plants	Y10 T2

The process of discovery and development of new medicines	Y10 T2
The impact of lifestyle factors on the incidence of non-communicable diseases	Y10 T1 T2

Coordination and control	
Principles of nervous coordination and control in humans	Y11 T1
The relationship between the structure and function of the human nervous system	Y11 T1
The relationship between structure and function in a reflex arc	Y11 T1
Principles of hormonal coordination and control in humans	Y11 T2
Hormones in human reproduction, hormonal and non-hormonal methods of contraception	Y11 T2
Homeostasis	Y11 T2
Photosynthesis	
Photosynthesis as the key process for food production and therefore biomass for life	Y10 T3
The process of photosynthesis	Y10 T3

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Factors affecting the rate of photosynthesis	Y10 T3
Ecosystems	
Levels of organisation within an ecosystem	Y10 T6
Some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community	Y10 T6
How materials cycle through abiotic and biotic components of ecosystems	Y10 T6
The role of microorganisms (decomposers) in the cycling of materials through an ecosystem	Y10 T6
Organisms are interdependent and are adapted to their environment	Y10 T6
The importance of biodiversity	Y10 T6

Methods of identifying species and measuring distribution, frequency and abundance of species within a habitat	Y10 T6
Positive and negative human interactions with ecosystems	Y10 T6

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Evolution, inheritance and variation	
The genome as the entire genetic material of an organism	Y10 T5
How the genome, and its interaction with the environment, influence the development of the phenotype of an organism	Y10 T4
The potential impact of genomics on medicine	Y10 T5
Most phenotypic features being the result of multiple, rather than single, genes	Y10 5
Single gene inheritance and single gene crosses with dominant and recessive phenotypes	Y10 T5
Sex determination in humans	Y10 T5
Genetic variation in populations of a species	Y10 T5
The process of natural selection leading to evolution	Y10 T4
The evidence for evolution	Y10 T4
Developments in biology affecting classification	Y10 T4

The importance of selective breeding of plants and animals in agriculture	Y10 T4
The uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology	Y10 T4

CHEMISTRY	
Atomic structure and the Periodic Table	
A simple model of the atom consisting of the nucleus and electrons, relative atomic mass, electronic charge and isotopes	Y11 T2
The number of particles in a given mass of a substance	Y11 T2
The modern Periodic Table, showing elements arranged in order of atomic number	Y11 T1

Science

Position of elements in the Periodic Table in relation to their atomic structure and arrangement of outer electrons	Y11 T1
Properties and trends in properties of elements in the same group	Y11 T1
Characteristic properties of metals and non-metals	Y11 T1
Chemical reactivity of elements in relation to their position in the Periodic Table	Y11 T1
Structure, bonding and the properties of matter	
Changes of state of matter in terms of particle kinetics, energy transfers and the relative strength of chemical bonds and intermolecular forces	Y11 T3
Types of chemical bonding: ionic, covalent, and metallic	Y11 T3
Bulk properties of materials related to bonding and intermolecular forces	Y11 T3
Bonding of carbon leading to the vast array of natural and synthetic organic compounds that occur due to the ability of carbon to form families of similar compounds, chains and rings	Y11 T3

Structures, bonding and properties of diamond, graphite, fullerenes and graphene	Y11 T3

Chemical changes	
Determination of empirical formulae from the ratio of atoms of different kinds	
Balanced chemical equations, ionic equations and state symbols	Y10 T1 T2
Identification of common gases	Y11 T1
The chemistry of acids; reactions with some metals and carbonates	Y10 T2
pH as a measure of hydrogen ion concentration and its numerical scale	Y10 T2
Electrolysis of molten ionic liquids and aqueous ionic solutions	Y10 T2
Reduction and oxidation in terms of loss or gain of oxygen	Y10 T2

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Energy changes in chemistry	
Measurement of energy changes in chemical reactions (qualitative)	Y10 T1
Bond breaking, bond making, activation energy and reaction profiles (qualitative)	Y10 T1
Rate and extent of chemical change	
Factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst	Y10 T3
Factors affecting reversible reactions	Y10 T4
Chemical analysis	
Distinguishing between pure and impure substances	Y11 T1
Separation techniques for mixtures of substances: filtration, crystallisation, chromatography, simple and fractional distillation	Y11 T1

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Quantitative interpretation of balanced equations	Y10 T1
Concentrations of solutions in relation to mass of solute and volume of solvent	
Chemical and allied industries	
Life cycle assessment and recycling to assess environmental impacts associated with all the stages of a product's life	Y10 T6
The viability of recycling of certain materials	Y10 T6
Carbon compounds, both as fuels and feedstock, and the competing demands for limited resources	Y10 T5
Fractional distillation of crude oil and cracking to make more useful materials	Y10 T5
Extraction and purification of metals related to the position of carbon in a reactivity series	Y10 T2 T6
Earth and atmospheric science	
Evidence for composition and evolution of the Earth’s atmosphere since its formation	Y11 T2

Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change	Y11 T2
Potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate	Y11 T2
Common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources	Y11 T2
The Earth's water resources and obtaining potable water	Y10 T6
PHYSICS	
Energy	
Energy changes in a system involving heating, doing work using forces, or doing work using an electric current: calculating the stored energies and energy changes involved	Y10 T1
Power as the rate of transfer of energy	Y10 T3
Conservation of energy in a closed system, dissipation	Y10 T1
Calculating energy efficiency for any energy transfers	Y10 T1

Science

Renewable and non-renewable energy sources used on Earth, changes in how these are used	Y10 T1

Forces	
Forces and fields: electrostatic, magnetic, gravity	Y10 T5
Forces as vectors	Y10 T6
Calculating work done as force x distance; elastic and inelastic stretching	Y10 T6
Pressure in fluids acts in all directions: variation in Earth's atmosphere with height, with depth for liquids, up-thrust force (qualitative)	Y10 T2
Forces and motion	
Speed of sound, estimating speeds and accelerations in everyday contexts	Y10 T6 Y11 T1

Science

Interpreting quantitatively graphs of distance, time, and speed	Y10 T6
Acceleration caused by forces; Newton's First Law	Y10 T6

Weight and gravitational field strength	Y10 T5
Decelerations and braking distances involved on roads, safety	Y10 T6
Wave motion	
Amplitude, wavelength, frequency, relating velocity to frequency and wavelength	Y11 T1
Transverse and longitudinal waves	Y11 T1
Electromagnetic waves, velocity in vacuum; waves transferring energy; wavelengths and frequencies from radio to gamma-rays	Y11 T1
Velocities differing between media: absorption, reflection, refraction effects	Y11 T1
Production and detection, by electrical circuits, or by changes in atoms and nuclei	Y11 T2

Uses in the radio, microwave, infra-red, visible, ultra-violet, X-ray and gamma ray regions, hazardous effects on bodily tissues	Y11 T1 Y11 T2
Electricity	
Measuring resistance using p.d. and current measurements	Y10 T3
Exploring current, resistance and voltage relationships for different circuit elements; including their graphical representations	Y10 T3
Quantity of charge flowing as the product of current and time	Y10 T3
Drawing circuit diagrams; exploring equivalent resistance for resistors in series	Y10 T3
The domestic a.c. supply; live, neutral and earth mains wires, safety measures	Y10 T4
Power transfer related to p.d. and current, or current and resistance	Y10 T3
Magnetism and electromagnetism	
Exploring the magnetic fields of permanent and induced magnets, and the Earth’s magnetic field, using a compass	Y10 T5

Magnetic effects of currents, how solenoids enhance the effect	Y10 T5
How transformers are used in the national grid and the reasons for their use	Y10 T4
The structure of matter	
Relating models of arrangements and motions of the molecules in solid, liquid and gas phases to their densities	Y10 T2 T6 Y11 T1
Melting, evaporation, and sublimation as reversible changes	Y10 T2
Calculating energy changes involved on heating, using specific heat capacity; and those involved in changes of state, using specific latent heat	Y10 T2
Links between pressure and temperature of a gas at constant volume, related to the motion of its particles (qualitative)	Y10 T2
The nuclear model and its development in the light of changing evidence	Y11 T2
Atomic structure	

Science

Masses and sizes of nuclei, atoms and small molecules	Y11 T2
Differences in numbers of protons, and neutrons related to masses and identities of nuclei, isotope characteristics and equations to represent changes	Y11 T2
Ionisation; absorption or emission of radiation related to changes in electron orbits	Y11 T2
Radioactive nuclei: emission of alpha or beta particles, neutrons, or gamma rays, related to changes in the nuclear mass and/or charge	Y11 T2
Radioactive materials, half-life, irradiation, contamination and their associated hazardous effects, waste disposal	Y11 T2
Nuclear fission, nuclear fusion and our Sun's energy	Not in the AQA Trilogy Spec
Space physics	
The main features of the solar system	Not in the AQA Trilogy Spec