Curriculum Mapping: Science Year 7-9

St Martin's School
Be the best you can be

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 -	**Introduction and safety** 7A Cells 7K Forces	7G Particle model 7B Reproduction	7E Acids 7 I Energy	7H Solutions 7C Environment and feeding relationships	7F Reactions 7J Electricity	7L Space 7D Variation and classification
	Concepts • learn that cells are the basic units of life and are organised into tissues from which organs are made • explore cell structure and differences between plant and animal cells • learn about some functions of cells • consolidate and build on their concept of force and its measurement • identify the origin of friction, air resistance, upthrust and weight and describe situations in which these forces act • distinguish between mass and weight • use the concept of speed • relate forces acting to changes in motion • identify situations in which forces are balanced and unbalanced	***Concepts*** • learn how the particle model can be used to explain differences between solids, liquids and gases • explore how experimental evidence relates to theories and models • extend their earlier ideas about human reproduction and consider how offspring are protected and nurtured • consider and compare reproductive patterns in other animals with those in humans • relate what they know of the way their bodies change during adolescence to knowledge about human reproduction, growth and the menstrual cycle	***Concepts*** • learn about acids and alkalis as classes of chemicals with distinct properties and uses • use indicators to classify solutions as acidic, alkaline or neutral • use the pH scale to compare the acidity and alkalinity of different solutions • begin to explore neutralisation • are introduced to the concept of energy in the context of fuels as convenient and therefore valuable sources • consider the nature and origin of fossil fuels and renewable sources of energy and how their use has implications for the environment • consolidate and extend their ideas about energy resources for living things: food for people and sunlight for plants • link the energy resources to the role of the Sun as the ultimate source of most of the Earth's energy resources	***Concepts*** • extend their knowledge of dissolving and the separation of the components of a solution and relate this to particle theory • begin to distinguish between a 'pure' substance and a mixture • apply the particle model of solids, liquids and gases in a range of contexts • how habitats vary • how plants and animals are adapted to live in a particular habitat • how plants and animals interact with their environment and with each other, including feeding relationships • about adaptations for feeding • how to link food chains to make webs	***Concepts*** • are introduced to the idea that chemical change results in new substances that are different from the ones from which they were made • explore some simple chemical reactions of acids in which a gas is made • explore burning as a chemical reaction involving a gas, air or oxygen • identify hydrogen and carbon dioxide as substances made during some of these reactions • work with gases to understand that gases are real materials • begin to use word equations as shorthand descriptions of reactions • consolidate and extend their ideas about circuits • use concepts of electric current and energy transfer to explain the working of circuits • explain patterns in the measurements of current and voltage • use the concept of resistance qualitatively • build circuits in which current flow is usefully controlled	***Concepts*** consolidate their ideas about the Sun and Moon, and use models of these to explain phenomena such as eclipses and the seasons. • learn that planets and satellites are seen by reflected light and that the Sun, as a star, emits light • compare the Sun with other stars • explore variation within and between species • consider why classification is important and are introduced to scientific classification of animals • investigate patterns of variation in living things and ways of representing and explaining the occurrence of variations

					• consider the hazards of electricity for humans	
	Justification: The cells unit draws on ideas developed in the key stage 2 programme of study. It relates to unit 5A 'Keeping healthy' and unit 6B 'Micro-organisms' in the key stage 2 scheme of work. The unit relates closely to unit 7B 'Reproduction' and unit 7D 'Variation and classification'. It introduces ideas and experimental techniques which pupils may not have encountered in the key stage 2 scheme of work. It provides the foundation for work on cells in all year 8 and year 9 units. The forces unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 4E 'Friction' and unit 6E 'Balanced and unbalanced forces' in the key stage 2 scheme of work. This unit lays the foundation for unit 9J 'Gravity and space', unit 9K 'Speeding up' and unit 9L 'Pressure and moments.	***Justification:*** The unit on the particle model uses ideas developed in the key stage 2 programme of study. It builds on unit 4D 'Solids, liquids and how they can be separated', unit 5C 'Gases around us', unit 5D 'Changing state' and unit 6C 'More about dissolving' in the key stage 2 scheme of work. This unit lays the foundation for subsequent work on particles. Thie reproduction unit draws on ideas developed in the key stage 2 programme of study. It builds on unit 5B 'Life cycles' in the key stage 2 scheme of work and on unit 7A 'Cells'. This unit relates to: • PSHE • drugs education • sex education	***Justification:*** The unit on acids uses ideas developed in the key stage 2 programme of study. It builds on unit 6C 'More about dissolving' and unit 6D 'Reversible and irreversible changes' in the key stage 2 scheme of work. This unit introduces pupils to chemicals, reactions and practical techniques which are likely to be new to them, through using a range of acids and alkalis encountered in familiar and laboratory contexts. It lays the foundation for work on reactions of acids in unit 9E 'Reactions of metals and metal compounds and work on carbonate rocks in unit 8G 'Rocks and weathering' and unit 8H 'The rock cycle' This energy unit introduces pupils to a topic which may be new to them, although it has links with work done in key stage 2. It builds on ideas introduced in unit 6A 'Interdependence and adaptation' (green plants need light), unit 6D 'Reversible and irreversible changes' (burning), unit 6G 'Changing circuits' (electrical conduction) and unit 4C 'Keeping warm' (temperature; thermal insulation) in the key stage 2 scheme of work. In unit 8I 'Heating and cooling', pupils will study energy transfer and change of state, and use particle explanations. In unit 9I 'Energy and electricity', pupils will study energy transformations and energy conservation.	***Justification:*** This unit develops work on solids, liquids and separating mixtures in the key stage 2 programme of study. It builds on unit 4D 'Solids, liquids and how they can be separated', unit 5C 'Gases around us', unit 5D 'Changing state', unit 6C 'More about dissolving' and unit 6D 'Reversible and irreversible changes' in the key stage 2 scheme of work. The unit builds on ideas introduced in unit 7G 'Particle model of solids, liquids and gases. This unit draws on ideas developed in the key stage 2 programme of study. It builds on unit 4B 'Habitats' and unit 6A 'Interdependence and adaptation' in the key stage 2 scheme of work. The energy transfer ideas of unit 7I 'Energy resources' are used in considering feeding relationships between organisms. As unit 7I 'Energy resources' has been covered first, then links can be made to the burning of fuels and foods and the Sun as the energy resource for plants.	***Justification:*** This unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 5C 'Gases around us and unit 6D 'Reversible and irreversible changes' in the key stage 2 scheme of work. This unit relates closely to unit 7E 'Acids and alkalis. Unit 9E 'Reactions of metals and metal compounds and unit 9F 'Patterns of reactivity' include further work on the reactions of acids and on burning as a chemical change. Unit 9H 'Using chemistry' includes work on the conservation of mass in chemical reactions, including burning. This unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 6G 'Changing circuits and unit 4F 'Circuits and conductors' in the key stage 2 scheme of work.	***Justification*** This unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 5E 'Earth, Sun and Moon' and unit 6F 'How we see things' in the key stage 2 scheme of work. The unit relates to unit 9J 'Gravity and space'. Reflection of light is covered in unit 8K 'Light'. This unit draws on ideas developed in the key stage 2 programme of study. It builds on unit 5B 'Life cycles and unit 6A 'Interdependence and adaptation' in the key stage 2 scheme of work, and on unit 7C 'Environment and feeding relationships. It provides a foundation for unit 8D 'Ecological relationships and unit 9A 'Inheritance and selection'.
	Tier 3 vocabulary Organ, tissue, cell, membrane, cytoplasm,	**Tier 3 vocabulary**	***Tier 3 vocabulary*** Acids, alkalis, indicator, solution, neutral,	**Tier 3 vocabulary** Solution, solvent, solute, soluble, insoluble,	***Tier 3 vocabulary*** Hydrogen, oxygen, carbon dioxide, methane,	**Tier 3 vocabulary** Planets, asteroids, satellite, orbit, eclipse

	nucleus, vacuole, cell wall, magnification Drag, upthrust, weight, mass, density, repeat reading, line of best fit	Particle, diffusion, gas pressure, vibration, theory, model, evidence, data Ovary, testis, oviduct, uterus, menstruation, ovulation, fertilisation, placenta, sperm, gestation, puberty, inherited, embryo, foetus	equation, harmful, corrosive, hazard, risk, pH, hydrochloric acid, sodium hydroxide Energy, fuel, accuracy, control of variables, reliability of results, repeat reading	saturated, filtration, distillation, chromatography, chromatogram Predator, prey, food web, migration, hibernation, dormant, producer, consumer, carnivore, sample size, reliable data	carbon, calcium carbonate, reactant, product Battery, cell, fuse, power supply, current, resistance, energy transfer	Segment, abdomen, vertebrate, invertebrate, characteristics, mammal, reptile, amphibian, bird, fish, taxonomic groups, classify.
	Assessment: Multiple choice test	***Assessment:*** Recall and application	***Assessment:*** Multiple choice	***Assessment:*** Recall and application	***Assessment:*** Multiple choice	***Assessment*** Recall and application

Wider reading/Cultural capital

- find out about the history of the microscope, including the light microscope and electron microscope and their use in developing our understanding of the organisation of living things.
- collect and discuss advertising and publicity material relating to streamlining and reducing friction, eg in cars, bicycles, sports clothing, oils and lubricants.
- look for stories (not necessarily in a scientific context) in newspapers, magazines and on television and radio where evidence is collected and considered, so that they appreciate the variety of situations in which evidence is important.
- read newspaper and magazine articles about cloning.
- observe hazard signs on transport vehicles and in public places.
- use the internet to find out about fossil fuels and renewable energy sources.
- look at labels of household liquids to find out whether they are pure liquids or mixtures.
- find out about wildlife conservation projects or ecology centres in their locality.
- visit museums, planetarium or virtual observatory through the internet, eg www.jb.man.ac.uk/
- watch TV programmes and use the internet to find out about current exploration of the solar system.
- visit a museum, zoo, botanical garden or fishery to observe a wider selection of living things.
- use the internet to find out more about the variety and classification of living things, eg www.nhm.ac.uk/

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 8 -	8A Food and digestion 8E Atoms and elements	8I Heating and cooling 8B Respiration	8F Compounds and mixtures 8J Magnets and electromagnets	8C Microbes and diseases 8K Light	8G Rocks and weathering 8L Sound and hearing	8D Ecological relationships 8H The rock cycle
	Concepts •about different foods and how they can be combined to produce a balanced diet • how food is broken down by digestion so it can be used by the body, for energy, growth and repair. • learn that the huge range of materials is made from a relatively small number of elements	**Concepts** •recognise the need for a temperature scale •learn to distinguish between heat (as energy) and temperature •learn about mechanisms of heat transfer: conduction, convection and radiation, and apply this to familiar contexts •learn about expansion and change of state in solids, liquids and gases	**Concepts** •distinguish between elements and compounds and how they are represented by symbols and formulae • recognise chemical change as a process in which atoms join together in new ways •distinguish between compounds and mixtures •distinguish between chemical reactions in	**Concepts** •learn that micro-organisms share the characteristics of other living things •find out about growing micro-organisms to make products, and about the role of micro-organisms in infectious diseases •learn about the body's defence systems and how immunisation can protect	**Concepts** • earn about rock texture as one of the key characteristics of different rock types • model rock texture •learn about the processes of weathering, erosion, transportation and sedimentation •relate processes, eg evaporation and dissolving, involved in rock	**Concepts** •study a habitat in detail and learn how: –organisms can be identified, and sizes of populations compared –feeding relationships can be modelled quantitatively –living things within a community influence each other and are affected by the environment •learn about the major rock-forming processes

	•learn that each element is composed of one sort of atom only •explore the characteristics of some elements •use the particle model to describe what happens when elements combine	•use the particle model to explain conduction, convection and change of state • how cells are supplied with the materials they need for respiration •how cells in animals and plants release energy •that the process of respiration is similar in all cells	which new compounds are formed and the formation of mixtures • identify magnetic materials, make a magnet and test the strength of a magnet • use the concepts of a magnetic field, a permanent magnet and an electromagnet • investigate factors affecting the strength of an electromagnet • explain the working of a number of devices that use magnets and electromagnets	against microbial infections • build on their knowledge of light and its effects •learn how we see objects •represent light as a ray and use this concept to explain reflection and refraction •find out about the origin of coloured light and the appearance of coloured objects	formation to processes observed in other contexts •consider processes operating on different timescales • build on their knowledge of sound and hearing •explain how sound travels through media •give an explanation of how the ear works, find out about the harmful effects of loud noise and how loud noise can be reduced	•learn how rock-forming processes are linked by the rock cycle •use the concept of rock texture as one of the key characteristics of igneous, sedimentary and metamorphic rocks • relate processes observed in other contexts, eg crystallisation, to processes involved in the rock cycle •consider processes operating on different timescales
	Justification: This unit draws on ideas about food and nutrition developed in the key stage 2 programme of study. It builds on unit 5A 'Keeping healthy' in the key stage 2 scheme of work and on unit 7A 'Cells'. The particle model of matter is introduced in unit 7G 'Particle model of solids, liquids and gases' and is revisited in this unit in the context of digestion. The energy transfer ideas of unit 7I 'Energy resources' are used in the context of digestion. Energy should be distinguished from 'stuff' (food as the energy resource or fuel). This unit relates closely to unit 7G 'Particle model of solids, liquids and gases' and unit 7H 'Solutions', in which the particle model is introduced and developed. The unit provides a foundation for unit 8F 'Compounds and mixtures', unit 9E 'Reactions of metals	***Justification*** This unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 4C 'Keeping warm' and unit 5D 'Changing state' in the key stage 2 scheme of work. In unit 7I 'Energy resources', pupils will have identified that when fuels burn they release energy and have noted the consequent rise in temperature. In unit 7G 'Particle model of solids, liquids and gases', pupils will have encountered the particle model of matter. In unit 9I 'Energy and electricity', pupils will study energy transformation and energy conservation. This unit builds on unit 8A 'Food and digestion', which needs to have been covered first. It is closely linked to the section on breathing and smoking in unit 9B 'Fit and healthy'. The unit relates to work on foods	***Justification:*** This unit builds on unit 8E 'Atoms and elements'. Work on temperature, melting points and boiling points relates to unit 8I 'Heating and cooling'. This unit relates closely to unit 7G 'Particle model of solids, liquids and gases' and to unit 7H 'Solutions'. Ideas in this unit about mixtures are picked up in unit 8G 'Rocks and weathering' and unit 8H 'The rock cycle'. Consideration of air as a mixture relates to unit 8B 'Respiration' and unit 9B 'Fit and healthy'. This unit builds on work done in unit 3E 'Magnets and springs' in the key stage 2 scheme of work and on unit 7J 'Electrical circuits. It lays the foundation for unit 9I 'Energy and electricity', which includes the generation and uses of electricity.	***Justification:*** This unit draws on ideas developed in the key stage 2 programme of study. It builds on unit 6B 'Microorganisms' in the key stage 2 scheme of work and on unit 8B 'Respiration'. In unit 9B 'Fit and healthy', pupils have further opportunities to consider the transmission and incidence of infectious diseases. This unit lays the foundation for work in key stage 4 on the body's defences against infection and the uses of micro-organisms in biotechnology. This unit uses ideas developed in the key stage 2 programme of study. It builds on ideas introduced in unit 3F 'Light and shadows' and unit 6F 'How we see things' in the key stage 2 scheme of work. Sound travel is compared to light in unit 8L 'Sound and hearing'.	***Justification:*** This unit builds on unit 3D 'Rocks and soils' in the key stage 2 scheme of work. The two units about Earth science draw on work about pH in unit 7E 'Acids and alkalis', work on evaporation in unit 7H 'Solutions', work on mixtures in unit 8F 'Compounds and mixtures' and work on changes of state in unit 8I 'Heating and cooling'. The unit provides a foundation for work on the rock cycle in unit 8H 'The rock cycle'. Ideas about weathering are revisited in unit 9G 'Environmental chemistry'. Together with unit 8H 'The rock cycle', this unit lays the foundation for work in key stage 4 on rock formation and deformation and on processes involving tectonic plates.	**Justification:** This unit builds on unit 7C 'Environment and feeding relationships' and unit 7D 'Variation and classification'. It draws on unit 8C 'Microbes and disease' and relates to unit 9C 'Plants and photosynthesis' and unit 9G 'Environmental chemistry'. It provides a foundation for unit 9D 'Plants for food'. It also provides a foundation for work in key stage 4 on energy transfer through an ecosystem and its relationship to food production. This unit builds on unit 8G 'Rocks and weathering' and work on the particle model in unit 7G 'Particle model of solids, liquids and gases' and in unit 8I 'Heating and cooling'. Work on carbonates relates to work on acids and carbonates in unit 7F 'Simple chemical reactions'. Rocks as

	and metal compounds' and unit 9F 'Patterns of reactivity'.	and fuels in unit 7I 'Energy resources' and to work on oxygen and burning in unit 7F 'Simple chemical reactions'. The unit lays the foundation for work on the composition of the blood, the structure of blood cells and the circulatory system at key stage 4.		The drawing of objects in different lighting conditions is covered in unit 8A 'Objects and viewpoints' in the art and design scheme of work. Light as a wave is studied at key stage 4.	This unit uses ideas developed in key stage 2. It builds on unit 5F 'Changing sounds' in the key stage 2 scheme of work. The wave nature of sound is further developed in key stage 4.	mixtures are considered in unit 8F 'Compounds and mixtures'. There are also connections with work on fossil fuels in unit 7I 'Energy resources'. This unit, together with unit 8G 'Rocks and weathering', provides the foundation for work in key stage 4 on rock formation and deformation and processes involving tectonic plates.
	Tier 3 vocabulary Intestine, villus, carbohydrate, protein, enzyme, absorb Element, compound, atom, molecule, symbol, formula, state, predicting	**Tier 3 vocabulary** Conduction, convection, radiation, insulator, conductor Lung, trachea, bronchus, ribcage, red blood cell, haemoglobin, artery, vein, breathing, ventilation, inspire, respire, inhale, exhale	**Tier 3 vocabulary** Element, compound, mixture, atom, composition, pure North seeking pole, south seeking pole, magnetic field, core, solenoid, coil	**Tier 3 vocabulary** Bacteria, viruses, fungi, measles, chicken pox, infection, pathogen, infectious disease, immunity, food poisoning, vaccination, inoculation, antibiotic, epidemic Transparent, opaque, spectrum, reflection, refraction, image	**Tier 3 vocabulary** Chemical weathering, abrasion, sedimentation, granite, limestone, sandstone, sedimentary, layers, porosity Loud, soft, quiet, high, low, pitch, noise pollution, temporary deafness, frequency, amplitude, wave, volume	**Tier 3 vocabulary** Community, habitat, pyramid of numbers, environment, ecosystem, quadrat sampling, transect, population sizes, reliable data Igneous, metamorphic, sedimentary, magma, lava, erupt, relative density, iron rich, crystals, aligned, porous
	Assessment: Multiple choice	***Assessment:*** Recall and application	***Assessment:*** Multiple choice	***Assessment:*** Recall and application	***Assessment:*** Multiple choice	***Assessment:*** Recall and application
	Wider reading/Cultural capital • read articles in magazines and newspapers about issues relating to food and diet, eg for athletes, pregnant women, very young children. • ask grandparents and other older people about materials that were used for clothing and utensils before plastics and synthetic fibres became so widely available. • find out what happens in the airways of asthma sufferers. • look at labels on household materials and on clothes to find out what they are made from and to identify the names of chemical compounds. • • observe the use of magnetic tags fitted to clothes to prevent shoplifting in clothes shops. • follow news stories about outbreaks of diseases such as typhoid, dysentery or cholera after natural disasters. • observe the effects of coloured lighting in shops, in theatres and on TV. • watch television programmes or videos about the Earth, which will help them understand how rocks are formed. • consider the effects of loud noise on hearing. • read newspaper articles, magazine articles and books about habitats, including those that are under threat or where protection schemes have resulted in species re-establishing themselves. • watch wildlife videos and television programmes about a range of very different habitats.					

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 9 -	9A Inheritance and selection 9E Reactions of metals and metal compounds 9I Energy and electricity	9B Fit and healthy 9F Patterns of reactivity 9J Gravity and space	9C Plants and photosynthesis 9G Environmental chemistry 9K Speeding up	9D Plants for food 9H Using chemistry. 9L Pressure and moments		
	Concepts •that characteristics are inherited and how this is used in selective breeding •why selective breeding is important • about variations arising from environmental differences •explore the properties of metals and non-metals •learn that different acids react in similar ways with metals, with metal carbonates and with metal oxides •represent elements by symbols and compounds by formulae •use word and symbol equations to describe these reactions •explore a range of useful energy transfers and transformations •discuss the use of electricity as a convenient way to transfer energy to do useful things •associate the concept of voltage with the transfer of energy in a circuit •investigate the voltage of cells •study how electricity is generated, with reference to environmental impacts •use the principle of conservation of energy to identify ways in which energy is dissipated during transfers	**Concepts** •how the human respiratory, digestive and circulatory systems interact to maintain activity •about the functions of the skeleton •about ways in which diet, exercise, smoking and drugs affect health •learn that although metals react in a similar way with oxygen, water and acids, some react more readily than others •establish and use a reactivity series for metals •represent chemical reactions by word and/or symbol equations •learn about the gravitational pull between bodies; how it depends on the masses of bodies and the distance between them •relate the movement of planets around the Sun, and that of satellites around the Earth, to gravitation •study how artificial satellites are used to observe the Earth and provide information about the solar system and the universe •find out about space exploration	**Concepts** •about photosynthesis as the key process producing new plant biomass •that the carbon dioxide for photosynthesis comes from the air and that the water is absorbed through the roots •that chlorophyll enables a plant to utilise light in photosynthesis •about the role of the leaf in photosynthesis •about the importance of photosynthesis to humans and other animals •learn that rocks, soils and building materials have a variety of chemical characteristics •learn that chemical weathering alters rocks and building materials over time •consider how the atmosphere and water resources are affected by natural processes and the activity of humans •consider how environmental conditions are monitored and controlled •distinguish between different environmental issues •use the concept of speed •consider the relationship between forces (including	**Concepts** •learn about humans as part of a complex food web •learn about factors affecting plant growth •learn how management of food production has many implications for other animal and plant populations in the environment •consider some of the issues involved in sustainable development of the countryside •find out more about how chemical reactions can be used as an energy source •consider how chemical reactions are used to make new materials •model chemical reactions as the rearrangement of atoms, and use the model to explain that matter is not lost •represent chemical reactions by word and/or symbol equations •study pressure on solids and describe applications of this in everyday appliances •study hydrostatic pressure in fluids and describe an application, eg hydraulic jack	**Concepts**	**Concepts**

			balanced forces) on an object, and its movement •study the effects of water and air resistance on speed, and how streamlining reduces these effects •use ideas of balanced and unbalanced forces to explain the movement of falling objects	•describe the operation of levers, including examples from the human body, which depend on the turning effect of a force •learn about the principle of moments		
	Justification: The unit builds on ideas introduced in unit 7A 'Cells', unit 7B 'Reproduction' and in unit 7D 'Variation and classification'. This unit provides opportunities to revisit and revise topics met in other units in years 7 and 8. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work. The unit is closely related to unit 9D 'Plants for food', which considers environmental influences on food production. This unit lays the foundation for work in key stage 4 on inheritance and genetics. This unit builds on unit 8E 'Atoms and elements' and unit 8F 'Compounds and mixtures'. In unit 7E 'Acids and alkalis', pupils will have observed neutralisation reactions, and in unit 7F 'Simple chemical reactions', they will have identified that there are chemical reactions between acids and metals and between acids and carbonates. However, they are unlikely to have considered the other	***Justification***: The unit builds on unit 7A 'Cells', unit 7B 'Reproduction', unit 8A 'Food and digestion', unit 8B 'Respiration', unit 8C 'Microbes and disease' and unit 9A 'Inheritance and selection'. This unit provides opportunities to revisit and revise work on nutrition and human respiration and the function of the circulatory system. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work. This unit builds on unit 8E 'Atoms and elements', unit 8F 'Compounds and mixtures' and unit 9E 'Reactions of metals and metal compounds'. Ideas in this unit are developed further in unit 9G 'Environmental chemistry' and unit 9H 'Using chemistry'. The unit lays the foundation for work in key stage 4 on metals and their compounds. This unit builds on unit 7K 'Forces and their effects' and unit 7L 'The solar system and beyond'. The unit	***Justification:*** This unit builds on unit 7D 'Variation and classification' and unit 7C 'Environment and feeding relationships'. It relates to unit 7I 'Energy resources', unit 8A 'Food and digestion', unit 8B 'Respiration', unit 8D 'Ecological relationships', unit 8F 'Compounds and mixtures', unit 9G 'Environmental chemistry' and unit 9H 'Using chemistry'. It provides the foundation for unit 9D 'Plants for food' and for work in key stage 4 on limiting factors in photosynthesis, energy transfer through an ecosystem and the mineral requirements of plants. This unit builds on unit 7E 'Acids and alkalis', unit 7F 'Simple chemical reactions', unit 8G 'Rocks and weathering' and unit 8H 'The rock cycle', and on work on the reactions of acids in unit 9E 'Reactions of metals and metal compounds'. It relates to work on growing plants in unit 9D 'Plants for food' and work on using	***Justification:*** The unit builds on unit 8D 'Ecological relationships' and unit 9C 'Plants and photosynthesis'. It relates to unit 9A 'Inheritance and selection', which considers genetic approaches to improving productivity on farms, and to unit 9G 'Environmental chemistry', in which the importance of air and water quality is considered. This unit provides opportunities to revisit and revise topics met in other units in years 7 and 8. With some pupils, teachers may wish to consolidate the earlier work, to concentrate on some of the new topics, extending activities, and with others, to spend more time on revision of previous work. This unit provides the foundation for work in key stage 4 on the impact of humans on the environment, the management of food-production systems and the importance of sustainable development. This unit builds on unit 9E 'Reactions of metals and metal compounds' and	***Justification:***	***Justification:***

	products of these reactions. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work. This unit lays the foundation for unit 9F 'Patterns of reactivity' This unit builds on work on electricity and energy in units 7I 'Energy resources', 7J 'Electrical circuits' and 8I 'Heating and cooling'. It relates to work on the reactivity of metals in unit 9F 'Patterns of reactivity' and work on fuels in unit 9G 'Environmental chemistry'	relates to unit 9K 'Speeding up'. It lays the foundation for work in key stage 4 on theories about the nature and evolution of the universe.	energy resources in unit 9I 'Energy and electricity'. This unit provides opportunities to revisit and revise topics met in other units in years 7 and 8. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work. The unit provides the foundation for work in key stage 4 on changes to the atmosphere and Earth. The unit builds on work in unit 7K 'Forces and their effects'. It relates to some of the ideas in unit 9J 'Gravity and space'. There is further work on forces in unit 9L 'Pressure and moments'.	unit 9F 'Patterns of reactivity'. It relates to other units, particularly to aspects of photosynthesis and respiration in unit 8B 'Respiration' and unit 9C 'Plants and photosynthesis', and to units about energy – unit 8I 'Heating and cooling' and unit 9I 'Energy and electricity'. This unit provides opportunities to revisit and revise topics met in other units in years 7 and 8. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work. This unit provides the foundation for work in key stage 4 on using chemical reactions to make new materials. This unit builds on unit 7K 'Forces and their effects' and links to unit 9K 'Speeding up'. Work on muscles as levers relates to unit 9B 'Fit and healthy'. This unit lays the foundation for further quantitative work on forces in key stage 4. This unit provides opportunities to revisit and revise topics met in other units, eg forces, particle theory. With some pupils, teachers may wish to concentrate on some of the new topics, extending activities, and with others to spend more time on revision of previous work.		

	Tier 3 vocabulary Clone, gene, genetic information, gamete, genetically modified, selective breeding, variety, breed, species Magnesium sulfate, copper carbonate, copper nitrate, sodium chloride, salt, reaction, product Conservation, dissipation, electric generator, dynamo, power station	**Tier 3 vocabulary** Vitamins, minerals, cilia, emphysema, addiction, trial Displacement, reactivity, salt, reactant, product, order of reactivity, qualitative observations Mass, weight, gravitational attraction, orbit, revolve	**Tier 3 vocabulary** Conifer, palisade cell, chlorophyll, biomass, photosynthesis, Ozone depletion, global warming, acid rain, catalytic convertor, air and water quality Accuracy, precision, proportional, constant speed, acceleration	**Tier 3 vocabulary** Herbivore, pesticide, weedkillers, nutrient, fertilisers, toxins, insecticide, fungicide, herbicide, competition, compete yield Mono-, poly- , -oxide, -ate Force, area, hydraulic, pneumatic, moment, pivot, lever, turning effect, counter balance	**Tier 3 vocabulary**	**Tier 3 vocabulary**
	Assessment: Multiple choice	***Assessment:*** Recall and application.	***Assessment:*** Multiple choice	**Assessment** Recall and application	***Assessment:***	***Assessment:***
	Wider reading/Cultural capital • watch television programmes or read newspaper and magazine articles about cloning and cellular 'surgery' and the impact of GMOs on the environment and evaluate whether such information is biased. • metal corrosion in the locality. • survey the power rating of various devices in the home or observe their electricity meter when different appliances are running. • find out about the strategies available to people wishing to give up smoking. • read news stories about metals, metal extraction and mining. • use the internet to communicate with space scientists online and access images from satellites, eg NASA's websites www.nasa.gov • read about forest clearances and the consequent loss of biodiversity. • read books, newspaper articles and periodicals about the environment, weather and climate changes. • collect examples of speed measured during sporting events, eg athletics, motor racing, tennis, and note the units and precision of the values expressed. • identify a number of devices in the home that rely on levers.					