

Key Stage 3 Curriculum Overview for Science

Start Date: September 2014

N.B. Due to limitations imposed by the availability of equipment each band will run a slightly different pathway but will cover the same content over a term. Guidance number of lessons provided may be subject to change throughout the year

Year 7					
Term	Unit(s)/Topics(s)	Key Learning Objectives	SMSC	No. of lessons	Assessment Method
HT1	Cells	<p>Recall the functions of the main organs in plants and humans</p> <p>Explain the functions of the parts of cells</p> <p>Use a microscope to see cells clearly</p> <p>Calculate microscope magnifications</p> <p>Describe what is meant by an organ transplant and explain why some people may not want to have one.</p>	<p>Pupils will carry out an extended task on donor cards in which they must explain moral reasons why some people may not want to have an organ transplant while others deem it to be perfectly acceptable. Different religions interpretations of what is allowed within their own faith will be discussed with pupils as part of the lesson.</p>	12	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on Cell structure</p> <p>English: Spelling and definition test</p> <p>Maths: Calculating magnification of different microscope lenses.</p>
	Chemical Reactions	<p>Carry out a fair and safe investigation to collect accurate evidence</p> <p>Identify some products of chemical reactions.</p> <p>Present data in graphical form.</p> <p>Describe the tests for hydrogen, oxygen and carbon dioxide</p> <p>Use word equations to represent burning reactions</p> <p>Describe some of the arguments for and against the use of fossil fuels and explosives in modern society</p>	<p>Fire safety lesson will be taught in the context of the Diwali festival of light which will be taking place in the coming months after this module. A brief outline of what the festival is will form the introduction to the lesson before moving on to the dangers of fireworks and the importance of the fire triangle.</p>	12	<p>Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on the difference between chemical reactions and physical changes.</p> <p>English: Spelling and definition test</p> <p>Maths: Calculation of averages and plotting graphs</p>
HT2	Acids and Alkalis	<p>Classify solutions as acidic, alkaline or neutral using indicator colours and pH values.</p> <p>Explain what happens to pH during neutralisation</p> <p>Recognise hazard warning symbols and act accordingly (maybe using secondary sources to find out the dangers).</p> <p>Describe how to lessen the risks of working with acids and alkalis</p> <p>Provide a balanced opinion for why you agree or disagree with others when discussing the arguments for and against industrial development in an area.</p>	<p>Pupils will provide a balanced opinion for why they agree or disagree with others when discussing the arguments for and against industrial development in an area. They must consider different members of the public's opinion in formulating their conclusion.</p>	13	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on indigestion tablets</p> <p>English: Spelling and definition test</p> <p>Maths: Identification of relationships in data, calculation of averages and pH values</p>

	Sound	Describe how a sound is made and how sound energy can be transferred from one place to another Explain the evidence linking changes in pitch and loudness to changes in vibrations Identify frequency, pitch, wavelength and amplitude on an oscilloscope trace Use the particle model to explain how sound is carried in different media Consider whether it is right or wrong to use animals in sound experiments and as tools (e.g. hunting for mines).	Pupils will consider whether it is morally right or wrong to use animals in sound experiments and as tools (e.g. hunting for mines).	9	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on the concept of how sound travels and sound insulation. English: Spelling and definition test Maths: identification of trends in data
HT3	Sound (continued) Particles and Matter	Make predictions that are explained using scientific knowledge. Give explanations for observations using the particle theory. Describe the arrangement and movement of particles in solids, liquids and gases. Explain how theories are changed based on new evidence Describe some of the problems caused by landfill.	Pupils will describe some of the problems caused by landfill both locally and internationally and explain the benefits of recycling and living sustainably.	13	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on states of matter English: Spelling and definition test Maths: presentation of data in graphical form
HT4	Space Energy	Describe how the planets are arranged in the Solar System and compare them to Earth Explain how we get days, nights and seasons using a model of the Earth and Sun Recognise that modern astronomy is based on the work of scientists from many cultures and different civilisations collaborating and exchanging ideas. Find, select and use information from secondary sources to investigate an idea or to compile a report. Give reasons for why you agree or disagree with others when discussing the arguments for and against governments' spending money on astronomy and space research. Explain why different people need different amounts of energy Describe what happens to fuel when it burns Compare the amount of energy different foods contain. Describe what happens in photosynthesis Recall the law of conservation of energy Describe some of the advantages and disadvantages of	Pupils must give reasons for why they agree or disagree with others when discussing the arguments for and against governments' spending money on astronomy and space research and whether this money would be better spent elsewhere. Explain some ways in which our use of fossil fuels can affect other people in this country and around the world.	6 13	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on why the sun changes position in the sky English: Spelling and definition test Maths: assessment of numerical data from secondary sources for a 'best fit' scenario. Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on living sustainably English: Spelling and definition test

Year 8	Term	Unit Title	Key Learning Objectives	SMSC	No. of lessons	Assessment Method
HT1	Light	Food and Digestion	Classify materials as opaque, transparent and translucent. Distinguish between reflectors and absorbers. Explain how filters and coloured objects transmit or reflect some colours and absorb others. Explain why a prism splits light into the colours of the spectrum Measure angles precisely and identify patterns in the data Consider the benefits and drawbacks of some uses of cameras in today's society.	Consider the benefits and drawbacks of some uses of cameras in today's society.	12	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on how periscopes work English: Spelling and definition test Maths: Measure angles precisely and identify patterns in the data
			describe what a balanced diet is recall the names and use of the major nutrients in food and good sources of these substances Safely carry out tests for the presence of various nutrients Describe how nutrients are digested and absorbed in the body explain what food allergies and intolerances are Describe the consequences of a poor diet	Consider the risks involved with having a poor data when forced upon them in the developing world and the pressures that come in the developed world with the Size Zero debate	12	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on how and where food is digested in the body English: Spelling and definition test Maths: display data in a variety of different forms
HT2	Rock Cycle	Respiration	Describe the different textures of the three types of rock and how each is formed and how different environmental factors can affect the texture of these rocks. Explain how rocks are weathered by chemical and physical processes Explain how fossils can be formed Link the different rock formation processes together in the rock cycle Plan a fair and safe investigation without help. Discuss the advantages and disadvantages of quarrying for materials	Discuss the advantages and disadvantages of quarrying for materials	8	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on the rock cycle English: Spelling and definition test Maths: Calculating the permeability of rock samples
			Recall the positions and functions of the organs in the respiratory/breathing and circulatory systems. Explain why tissues need a good blood supply and the consequences of receiving insufficient volumes of oxygen Explain the differences between inhaled and exhaled air. Explain the role of alveoli in gas exchange. Describe how glucose, oxygen and carbon dioxide are transported around the body by the circulatory system. Explain how respiration is similar and different to burning fuels. Describe aerobic respiration and represent in word/symbol equations	Describe the affects that some drugs can have on our health	10	Content Recall: Quick Quiz of 20 multiple choice questions Scientific understanding: end of unit test Extended Writing: AfL task on what happens to the air that we breathe in English: Spelling and definition test Maths: Record observations accurately and identify patterns in data using charts

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HT3	Solutions	<p>Recall some examples of the uses of different separating techniques.</p> <p>Describe what happens in dissolving in terms of particles.</p> <p>Describe how solubility increases with increasing temperature and what a saturated solution is</p> <p>Describe how to separate simple mixtures using filtration and chromatography.</p> <p>Carry out evaporation and distillation safely in the laboratory and present data from investigations as line graphs.</p> <p>Describe some of the human and environmental effects of supplying large quantities of water.</p>	Describe some of the human and environmental effects of supplying large quantities of water.	12	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on what happens to the sugar in a cup of tea</p> <p>English: Spelling and definition test</p> <p>Maths: Produce line graph from data collected and analysed</p>
	Electricity	<p>Construct simple electrical circuits safely and make accurate measurements</p> <p>Describe what happens to current and voltage in parallel and series circuits</p> <p>Explain how fuses work</p> <p>Draw circuit diagrams using standard symbols</p> <p>Predict what the currents will be in different parts of series and parallel circuits</p> <p>Explain the hazards of electricity and how the risks of using it are identified and controlled as part of an investigation plan</p> <p>Describe some of the technological developments made possible by electricity.</p> <p>Wire a plug correctly.</p> <p>Explain the strengths and weaknesses of some of the models used to explain electricity</p>	Describe some of the technological developments made possible by electricity and how this compares with the developing world?	12	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on how a torch works</p> <p>English: Spelling and definition test</p> <p>Maths: Calculate current, voltage and resistance in different parts of an electric circuit.</p>
HT4	Electricity (continued) Atoms, Elements, Compounds and Mixtures	<p>Represent elements using chemical symbols</p> <p>Use particle diagrams to tell the difference between elements, compounds and mixtures</p> <p>Describe how the periodic table is used to classify the elements.</p> <p>Use the particle model to explain changes of state</p> <p>Explain that when atoms of different elements combine, compounds are made</p> <p>Carry out a number of practical methods using a range of apparatus, being aware of the hazards involved</p> <p>Use ideas about atoms and bonding to explain why a substance is classified as an element, compound or mixture</p> <p>Use practical evidence or secondary sources to classify materials as metals and non-metals, or as elements and compounds</p>	<p>Pupils use the theme of materials used in jewellery to explore the differences between elements, compounds and mixtures.</p> <p>They will also research the conditions of the people around the world who extract the raw materials such as in the instance of 'blood diamonds' and ethics of this.</p>	15	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on the difference between elements, compounds and mixtures</p> <p>English: Spelling and definition test</p> <p>Maths: Look for patterns in data in the periodic table</p>
HT5	Atoms (continued) Heat Transfer	Use the idea of particles to explain how conduction, convection, expansion ,	Consider whether using	12	Content Recall: Quick Quiz of 20 multiple

		<p>changes of state and temperature changes during these changes of state occur</p> <p>Plan a fair investigation without help, make accurate measurements that lead to dependable conclusions and present data from investigations as line graphs</p> <p>Describe how substances expand or contract, and change state.</p> <p>Describe what happens in a convection current when fluids are heated.</p> <p>Explain the difference between heat and temperature.</p> <p>Explain what infrared radiation is and how it is similar to light.</p> <p>Consider how some developments in clothing technology have changed the things that people can do</p>	<p>humans in certain experiments is right or wrong</p>		<p>choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on how a hot cup of tea cools down</p> <p>English: Spelling and definition test</p> <p>Maths: present data from investigations as line graphs</p>
HT6	Selective Breeding and Chromosomes	<p>Suggest arguments for and against selective breeding, cloning and genetic modification.</p> <p>Describe some desirable characteristics in plant varieties and animal breeds.</p> <p>Identify characteristics that are of benefit or harmful to an organism</p> <p>Recall some inherited characteristics and some that are influenced by environmental conditions.</p> <p>Explain how offspring with particular characteristics can be produced by selective breeding and how this differs to natural selection</p> <p>Describe how inherited and environmental factors can affect characteristics.</p> <p>Explain what genetic information is and how it is stored.</p> <p>Describe some of the public reaction to introducing genetically modified organisms</p> <p>Suggest arguments for and against selective breeding, cloning and genetic modification.</p>	<p>Suggest arguments for and against selective breeding, cloning and genetic modification.</p>	16	<p>Content Recall: Quick Quiz of 20 multiple choice questions</p> <p>Scientific understanding: end of unit test</p> <p>Extended Writing: AfL task on selectively breeding dogs</p> <p>English: Spelling and definition test</p> <p>Maths: Interpret data presented in graphical form</p>