



## Year 7 Science Curriculum Overview

**Rationale:** The Year 7 curriculum is designed to provide students the skill set to be confident in working within the science laboratory in order to investigate and explore the world around them. Students will experience a range of modules including; cells, new life, forces, space, elements, atoms and chemical reactions which will help them to develop their inquisitive thinking, practical skills and general scientific knowledge on scientific theories.

*\*Science units are taught on a rotation basis between each group*

Term/Length of Time	Outline	Assessment/Teacher Feedback Opportunities	Homework and Literacy resources
<p><b>Y7 Science</b> Autumn 1</p> <p><b>Introduction to Working Scientifically</b> 11 lessons (including assessment and responding to feedback lessons)</p>	<p>Introduction to Science .To complement the introduction to science investigations from KS2, students will learn about variables, planning experiments, drawing tables and graphs and evaluating results.</p> <p>All lessons have a practical context and are based around simple experiments that allow students to gain hands-on experience in using simple apparatus, in addition to learning some of the skills which are important in scientific investigations. The lessons are based on general science.</p>	<p>End of Working Scientifically assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>Homework is set weekly and contains a mixture of simple recall questions often followed with a more detailed application based question(s).</p> <p>All homework is reviewed with at least one detailed FAR (Feedback, Action, Response) marked by the teacher per module.</p> <p><b>Optional homework tasks and Literacy resources:</b></p> <p>SoL on science shared area, including PowerPoints, details of practical</p>

			<p>investigations, worksheets, revision resources, a range of AFL (assessment for learning) activities, research based tasks, simple model making, reports, short answer questions, newspaper style write-ups as well as homework.</p> <p>The Sciences offer many opportunities to develop and extend students' literacy skills. There is a large amount of new, subject-specific vocabulary, and so each unit includes a keywords sheet which students will learn during the unit. Students will use texts to find out information for themselves, using the functional layout of such texts, including index, contents and glossary sections of text books used in class, and also at home in an online format. Students will also review and connect information within topics, so fact sheets are provided for each topic.</p> <p>Useful websites:  <a href="http://www.bcbitesize.co.uk">www.bcbitesize.co.uk</a>  <a href="http://www.senecalearning.com">www.senecalearning.com</a></p>
7B1			

<p>8 lessons (including assessment and responding to feedback lessons)</p> <p><b>7B2</b></p>	<p>Students learn about the structure and function of plant, animal and unicellular cells, specialised cells in multicellular organisms, and how substances move in and out of cells. Students also have hands-on experience with learning how to use microscopes to study cells, learning how to prepare slides, use a microscope to view cells and how to draw scientific diagrams of cells. Students learn how to calculate total magnification</p> <p><u>Knowledge</u></p> <ul style="list-style-type: none"> <li>• cells as the fundamental unit of living organisms.</li> <li>• the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts</li> <li>• the similarities and differences between plant and animal cells</li> <li>• the role of diffusion in the movement of materials in and between cells</li> <li>• the structural adaptations of some unicellular organisms</li> </ul> <p><u>Skills</u></p> <ul style="list-style-type: none"> <li>• Observe, interpret and record cell structure using a light microscope</li> <li>• Calculate total magnification</li> </ul>	<p><b>7B1</b> end of topic assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>Homework is set weekly and contains a mixture of simple recall questions often followed with a more detailed application based question(s). All homework is reviewed with at least one detailed FAR (Feedback, Action, Response) marked by the teacher per module.</p> <p><b>Optional homework tasks and Literacy resources:</b></p> <p>SoL on science shared area, including PowerPoints, details of practical investigations, worksheets, revision resources, a range of AFL (assessment for learning) activities, research based tasks, simple model making, reports, short answer questions, newspaper style write-ups as well as homework.</p> <p>The Sciences offer many opportunities to develop and extend students' literacy skills. There is a large amount of new, subject-specific vocabulary, and so each unit includes a keywords sheet which students will learn during the unit. Students will use texts to find out information for themselves, using the functional layout of such texts, including index, contents and glossary sections of text books used in class, and also at home in an online format. Students will also review and connect information within</p>
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<p>8 lessons (including assessment and responding to feedback lessons)</p> <p><b>7B3</b></p>	<p>Students use the knowledge gained in 7B1 about cells and specialised cells, and how they work together to form tissues, organs and organ systems. Students then learn about the respiratory and skeletal organ systems in greater depth. Teaching and learning methods include modelling, practical investigations into muscle strength and lung volume and dissections.</p> <p><u>Knowledge</u></p> <ul style="list-style-type: none"> <li>• the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.</li> <li>• The skeletal and muscular systems</li> <li>• the structure and functions of the human skeleton, to include support, protection, movement and making blood cells</li> <li>• biomechanics – the interaction between skeleton and muscles the function of muscles and examples of antagonistic muscles</li> <li>• the structure and functions of the gas exchange system in humans, including adaptations to function</li> <li>• the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases.</li> <li>• the impact of exercise and asthma on the human gas exchange system</li> </ul> <p><u>Skills</u></p> <ul style="list-style-type: none"> <li>• Simple measurements of lung volume</li> <li>• including the measurement of force exerted by different muscles</li> </ul>	<p><b>7B2</b> end of topic assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>topics, so fact sheets are provided for each topic.</p> <p>Useful websites:  <a href="http://www.bcbitesize.co.uk">www.bcbitesize.co.uk</a>  <a href="http://www.senecalearning.com">www.senecalearning.com</a></p>
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<p>11 lessons (including assessment and responding to feedback lessons)</p>	<p>Following on from 7B2, another organ system is studied in greater depth. Reproduction is studied first in humans, then in plants. Teaching and learning methods include video clips, annotated diagrams, animations, demo examples of contraceptives and practical investigations into dispersal mechanisms of seeds.</p> <p><u>Knowledge</u></p> <ul style="list-style-type: none"> <li>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</li> <li>reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal</li> </ul> <p><u>Skills</u></p> <ul style="list-style-type: none"> <li>Quantitative investigation of some dispersal mechanisms.</li> </ul>	<p><b>7B2</b> end of topic assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	
<p><b>Chemistry</b></p> <p><b>7C1 Particle Theory</b> (9 lessons including assessment and feedback)</p>	<p>Students recap their knowledge from KS2 about the particle arrangements for Solids, Liquids and Gases. Student learn how to describe and explain the properties of matter and changes of state. Students will experience a range of practical techniques and equipment such as the use of thermometers to accurately observe boiling and melting points.</p> <p><b>Knowledge</b></p>	<p><b>7C1</b> End of Topic Assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>Homework is set weekly and contains a mixture of simple recall questions often followed with a more detailed application based question(s). All homework is reviewed with at least one detailed FAR (Feedback, Action, Response) marked by the teacher per module.</p> <p><b>Optional homework tasks and Literacy resources:</b></p>

<p><b>7C2</b> <b>Elements, Atoms and Compounds</b> (7 lessons including assessment and feedback)</p> <p><b>7C3</b> <b>Chemical Reactions</b></p>	<ul style="list-style-type: none"> <li>• The properties of the different states of matter (solid, liquid and gas) in terms of the particle model</li> <li>• Changes of state in terms of the particle model.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Using a thermometer to observe melting and boiling points</li> <li>• Plotting and analysing melting and boiling graphs</li> </ul> <p>Students will look at specific terminology for describing substances such as atom, element, compound and mixture. Students will use various models to help describe and explain the different concepts.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• A simple atomic model</li> <li>• Differences between atoms, elements and compounds</li> <li>• Chemical symbols and formulae for elements and compounds</li> <li>• Diffusion in terms of the particle model</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Using various models to help describe and explain different concepts</li> <li>• Using the periodic table to provide information about elements and compounds</li> </ul>	<p><b>7C2</b> End of Topic Assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p> <p><b>7C3</b> End of Topic Assessment in the style of exam questions</p>	<p>SoL on science shared area, including PowerPoints, details of practical investigations, worksheets, revision resources, a range of AFL (assessment for learning) activities, research based tasks, simple model making, reports, short answer questions, newspaper style write-ups as well as homework.</p> <p>The Sciences offer many opportunities to develop and extend students' literacy skills. There is a large amount of new, subject-specific vocabulary, and so each unit includes a keywords sheet which students will learn during the unit. Students will use texts to find out information for themselves, using the functional layout of such texts, including index, contents and glossary sections of text books used in class, and also at home in an online format. Students will also review and connect information within topics, so fact sheets are provided for each topic.</p> <p>Useful websites:  <a href="http://www.bbcbitessize.co.uk">www.bbcbitessize.co.uk</a>  <a href="http://www.senecalearning.com">www.senecalearning.com</a></p>
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<p>(10 lessons including assessment and feedback)</p>	<p>Students will consider the various ways that substances can interact and learn how to write equations to illustrate the reactions taking place. Students will carry out several practicals including combustion reactions, thermal decomposition and making accurate observations of mass changes.</p>	<p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	
<p><b>7C4 Acids and Alkalis</b> (7 lessons including assessment and feedback)</p>	<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• Chemical reactions as the rearrangement of atoms</li> <li>• Representing chemical reactions using formulae and using equations</li> <li>• Combustion, thermal decomposition, oxidation and displacement reactions</li> <li>• Conservation of mass, changes of state and chemical reactions</li> <li>• Catalysts</li> <li>• Exothermic and endothermic chemical reactions</li> <li>• Rusting</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Developing general practical skills</li> <li>• Use of Bunsen burner, balances and general scientific equipment</li> </ul> <p>Students will evaluate similarities and differences between acids and alkalis. Students will learn about and investigate the pH scale, use of indicators and the effectiveness of indigestion remedies.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• Defining acids and alkalis in terms of neutralisation reactions</li> </ul>	<p><b>7C4</b> End of Topic Assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	

	<ul style="list-style-type: none"> <li>• The pH scale for measuring acidity/alkalinity; and indicators</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Plan and carry out investigations and evaluate their methods</li> <li>• Use of indicators</li> <li>• Use of general scientific equipment</li> </ul>		
<p><b>Physics</b> <b>7P1 Forces</b> (8 lessons including assessment and feedback)</p>	<p>Students learn about what Forces are, examples of forces and the effect of balanced and unbalanced forces. Students also have hands-on experience of measuring forces, investigating Hooke’s Law, and gravitational field strength.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• What forces are and what they do</li> <li>• Interaction pairs</li> <li>• Effects of squashing and stretching, Hooke’s law</li> <li>• Friction and drag, how they can be useful or a nuisance, how they can be reduced or optimised</li> <li>• Non-contact forces including magnetism, electrostatic force and gravity</li> <li>• What weight and mass are and why they differ</li> <li>• What happens when forces are balanced or unbalanced</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Measuring forces</li> <li>• Plotting graphs of Hooke’s la</li> <li>• Using a Newton-meter correctly</li> </ul>	<p><b>7P1 End of Topic Assessment</b> in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>Homework is set weekly and contains a mixture of simple recall questions often followed with a more detailed application based question(s). All homework is reviewed with at least one detailed FAR (Feedback, Action, Response) marked by the teacher per module.</p> <p><b>Optional homework tasks and Literacy resources:</b></p> <p>SoL on science shared area, including PowerPoints, details of practical investigations, worksheets, revision resources, a range of AFL (assessment for learning) activities, research based tasks, simple model making, reports, short answer questions, newspaper style write-ups as well as homework.</p> <p>The Sciences offer many opportunities to develop and extend students’ literacy skills. There is a large amount of new, subject-</p>
<p><b>7P2 – Sound</b></p>	<p>Students learn about Waves including types and examples, sound, loudness and pitch, detecting sound (the ear and the</p>		



<p>(8 lessons including assessment and feedback)</p>	<p>microphone), Echoes and Ultrasound. Students also have hands-on experience of modelling waves, measuring sounds, and calculations involving the speed of sound.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• What waves are and the features of a wave.</li> <li>• How transverse and longitudinal waves compare.</li> <li>• How waves can be reflected.</li> <li>• The nature of sound.</li> <li>• The speed of sound relative to light.</li> <li>• The causes of loudness and pitch.</li> <li>• What ultrasound it.</li> <li>• How the ear works and how microphones work.</li> <li>• What echoes are and how they apply to medical scanning and sonar.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Modelling waves</li> <li>• Investigating the speed of sound</li> <li>• Relating the parts of a wave to aspects of sound</li> <li>• Carrying out calculations regarding the speed of sound</li> </ul>	<p><b>7P2</b> End of Topic Assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	<p>specific vocabulary, and so each unit includes a keywords sheet which students will learn during the unit. Students will use texts to find out information for themselves, using the functional layout of such texts, including index, contents and glossary sections of text books used in class, and also at home in an online format. Students will also review and connect information within topics, so fact sheets are provided for each topic.</p> <p>Useful websites:  <a href="http://www.bbcbitessize.co.uk">www.bbcbitessize.co.uk</a>  <a href="http://www.senecalearning.com">www.senecalearning.com</a></p>
<p><b>7P3 - Light</b> (7 lessons including assessment and feedback)</p>	<p>Students learn about luminous and non-luminous objects, reflection, refraction, lenses, the eye, cameras, dispersion and colour. Students also have hands-on experience of using mirrors and ray boxes, prisms, lenses, colour filters, making pinhole cameras and will see and possibly carry out an eye dissection.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• How light travels and why we see luminous and non-luminous objects</li> </ul>	<p><b>7P3</b> End of Topic Assessment in the style of exam questions</p> <p>Written and verbal feedback given throughout module</p>	

<p><b>7P4 - Space</b> (8 lessons including assessment and feedback)</p>	<ul style="list-style-type: none"> <li>• How reflection works with different surfaces</li> <li>• How refraction works and its applications in lenses</li> <li>• The anatomy of the eye and the functions of its part</li> <li>• How a camera works</li> <li>• The composition of white light and why we see colour</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Using a ray box, mirror, prisms and colour filters</li> <li>• Drawing ray diagrams</li> <li>• Observing and possible complete a dissection and relating this to diagrams</li> <li>• Using a pinhole camera</li> </ul> <p>Students learn about the night sky, the solar system, the movement of the earth and moon and their apparent motion, including eclipses. Students also have hands-on experience of modelling these ideas.</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• Describe objects commonly visible in the night sky.</li> <li>• The order of planets in the solar system, their composition, relative orbits and conditions.</li> <li>• The motion of the earth in its orbit and how this explains night and day, seasons and years.</li> <li>• The motion of the moon in its orbit and how this explains its normal changes in appearance as well as eclipses.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Relating observed phenomena to abstract ideas.</li> <li>• Modelling as a means of explaining the behaviour of objects in space.</li> </ul>	<p>through in-class activities and homework.</p> <p><b>7P4 End of Topic Assessment</b> in the style of exam questions</p> <p>Written and verbal feedback given throughout module through in-class activities and homework.</p>	

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for all and in all that we do

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