



## Academic Overview 2018-19

Science						
	Term 1.1	Term 1.2	Term 2.1	Term 2.2	Term 3.1	Term 3.1
Year 7	<ul style="list-style-type: none"><li>• Cells</li><li>• Movement</li><li>• Particles</li></ul>	<ul style="list-style-type: none"><li>• Atoms, Elements &amp; Compounds</li><li>• Forces</li></ul>	<ul style="list-style-type: none"><li>• Healthy Diet</li><li>• Separating Techniques</li></ul>	<ul style="list-style-type: none"><li>• Levers, Moments &amp; Pressure</li></ul>	<ul style="list-style-type: none"><li>• Reproduction</li><li>• Movement &amp; Speed</li></ul>	<ul style="list-style-type: none"><li>• Reactions</li><li>• Space</li></ul>
Year 8	<ul style="list-style-type: none"><li>• Photosynthesis, Respiration &amp; Circulation</li><li>• Health</li></ul>	<ul style="list-style-type: none"><li>• Acids &amp; Bases</li><li>• Materials</li><li>• Energy</li></ul>	<ul style="list-style-type: none"><li>• The Environment</li></ul>	<ul style="list-style-type: none"><li>• Rocks</li><li>• Waves</li></ul>	<ul style="list-style-type: none"><li>• Genetics</li></ul>	<ul style="list-style-type: none"><li>• Human Impacts on the Environment</li><li>• Electricity &amp; Magnetism.</li></ul>



## Year 7 Science Curriculum Content Overview 2018-19

<b>Knowledge and Skills</b> <b>Students will be taught to....</b>	<b>Reading, Oracy, Literacy and Numeracy</b>	<b>Formative Assessment</b>	<b>Summative Assessment</b>
<ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of cells.</li> <li>Describe the importance of the skeleton and muscles, and how they work together.</li> <li>Identify and describe changes of state and diffusion of gases.</li> <li>Label an atom and name examples of atoms, elements, compounds &amp; mixtures.</li> <li>Label forces diagrams and explain the effects of forces.</li> <li>Describe the role of different nutrient groups &amp; explain how parts of the digestive system are adapted to carry out their functions effectively.</li> <li>Describe some of the key aspects of pregnancy, birth and the menstrual cycle.</li> <li>Identify examples of separating techniques, and explain how each one is carried out.</li> <li>Identify reactions as exothermic and endothermic and explain experimental observations based on the reactivity series.</li> <li>Identify the pivot, effort &amp; load of a lever and calculate the turning effect.</li> <li>Calculate pressure and explain why objects apply different amounts of pressure to a surface.</li> <li>Interpret a distance-time graph and describe some changes in motion.</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>Smart Science Textbook</li> <li>Recommended reading texts</li> </ul> <hr/> <p><b>Numeracy</b></p> <ul style="list-style-type: none"> <li>Recall, use and application of equations</li> <li>Interpretation of distance-time graphs</li> </ul> <hr/> <p><b>Oracy and Literacy (including key words for practical subjects)</b></p> <ul style="list-style-type: none"> <li>Key words</li> <li>Reading &amp; writing practical methods</li> <li>Six mark questions</li> </ul>	<p>Questioning in lessons</p> <p>Live student performance in lessons followed by questions</p> <p>Whole class feedback during lessons</p> <p>Low stakes quizzing &amp; spelling tests</p> <p>11 learning checkpoints (one at the end of each topic).</p>	<p>2 cumulative assessments throughout the academic year.</p>



## Assessment Skills, Knowledge and Concepts Map

Key learning questions	Development Stage Science Term 1
<p>Identify the different parts of a light microscope. What is the function of each part?</p> <p>Calculate the total magnification of a microscope, when the eyepiece lens is x10 and the objective lens is x50.</p> <p>Explain the steps involved when preparing a specimen (e.g. onion cells) for viewing under a light microscope.</p> <p>Draw and label an animal, plant and bacteria cell &amp; describe the role of each part.</p> <p>How are animal, plant and bacteria cells similar and different to each other?</p> <p>Explain how a sperm cell, egg cell, root hair cell and red blood cell are adapted to their functions.</p>	<p style="text-align: center;"><b>Cells</b></p> <ul style="list-style-type: none"> <li>• Identify the parts of a microscope and describe the role of each part.</li> <li>• Calculate the total magnification of a microscope.</li> <li>• Explain how to prepare a specimen for viewing under a light microscope.</li> <li>• Identify cell structures found in animal, plant and bacteria cells, and describe the role of each organelle.</li> <li>• Summarise the differences, in terms of cell structures, between animal, plant and bacteria cells.</li> <li>• Describe and explain some adaptations of specialised cells, e.g. sperm cell, egg cell, root hair cell, red blood cell.</li> <li>• Explain how these adaptations allow specialised cells to carry out their functions effectively.</li> </ul>
Key learning questions	Movement
<p>What are the five functions of the human skeleton?</p> <p>Which parts of the skeleton protect the vital organs?</p> <p>What is a joint? Name some examples of joints in the body.</p> <p>Draw &amp; label a synovial joint and describe the roles of the cartilage and synovial fluid.</p> <p>Explain what arthritis is and how it affects human joints.</p> <p>Name the antagonistic muscle pair in the upper arm and explain how they cause movement.</p>	<ul style="list-style-type: none"> <li>• State and describe the functions of the skeleton, including which parts are involved with protecting organs.</li> <li>• Define what a joint is and name some examples of joints in the human body.</li> <li>• Label a synovial joint and describe its function.</li> <li>• Describe the role of the cartilage and the synovial fluid in a joint.</li> <li>• Explain how the condition arthritis affects the joints.</li> <li>• Identify the muscles found in the upper arm.</li> <li>• Explain how antagonistic muscles provide movement in the upper arm.</li> </ul>



Key learning questions	Particles
<p>Name the three states of matter and draw a particle diagram for each one.</p> <p>Describe some of the properties of solids, liquids and gases.</p> <p>Describe what happens to the particles during each change of state (melting, boiling, evaporating, condensing &amp; freezing.)</p> <p>State some of the properties of gases.</p> <p>Describe how the particles are arranged in a gas.</p> <p>Describe the process of diffusion in gases.</p>	<ul style="list-style-type: none"><li>• Recall the states of matter and draw accurate particle diagrams for each one.</li><li>• Sort simple materials into solids, liquids and gases by observation of their physical properties.</li><li>• Explain which properties are associated with each state of matter.</li><li>• Recall a definition of melting, boiling, evaporating, condensing and freezing.</li><li>• Describe how the motion of the particles changes as a substance changes state.</li><li>• State some properties of gases.</li><li>• Describe the arrangement of particles in a gas.</li><li>• Explain the properties of gases in terms of their particle arrangement.</li><li>• Describe the process of diffusion in gases.</li></ul>
Key learning questions	Atoms, Elements & Compounds
<p>Label a diagram of an atom, including relative sizes and charges.</p> <p>Identify three examples of metals, and three non-metals, in the periodic table.</p> <p>Use the periodic table to state the group that sodium is in, in the periodic table.</p> <p>Explain some trends of elements in the periodic table as you go down a group.</p> <p>State some properties of metals and non-metals and link these to their everyday functions.</p> <p>Write a definition for the terms atom, element, compound &amp; mixture.</p> <p>Explain that how the properties of a compound differ from its constituent elements.</p>	<ul style="list-style-type: none"><li>• Recall the main sub-atomic particles and label a diagram of an atom</li><li>• Describe the relative sizes and the charges on the particles in an atom.</li><li>• Identify where the metals and non-metals are located in the periodic table.</li><li>• Correctly define a group and period.</li><li>• Use the Periodic Table to give the period and group for a given element.</li><li>• Apply the trends in properties of a group to suggest how the properties change as you go down another group of the Periodic Table.</li><li>• Carry out a series of tests to determine the properties of metals and non-metals.</li><li>• Describe the difference in the properties of metals and non-metals and link this to their everyday functions.</li><li>• Define the terms atom, element, compound &amp; mixture</li><li>• Draw a particle model for atoms, elements compounds &amp; mixtures.</li><li>• Explain that the properties of a compound are independent from the properties of the elements that make it.</li><li>• Name simple compounds limited to containing two elements</li><li>• Suggest the elements contained in a compound that involves more than two elements</li></ul>



Key learning questions	Forces
<p>Give some examples of forces and when they act.</p> <p>Draw and label a force diagram of a moving car, using arrows.</p> <p>Give some ways in which you could increase or decrease the force of friction on an object.</p> <p>Explain the effects of air resistance on a moving object such as a skydiver.</p> <p>Identify whether forces are balanced or unbalanced, and describe how this affects movement.</p> <p>Outline some of the key differences between weight and mass.</p> <p>Explain why a person's weight changes on different planets.</p>	<ul style="list-style-type: none"> <li>• Identify some examples of forces &amp; situations where forces are acting</li> <li>• Represent forces using arrows</li> <li>• Measure frictional forces simply with a Newton meter</li> <li>• Explain how frictional forces can be reduced/increased.</li> <li>• Describe the effects of air resistance and frictional drag on skydivers</li> <li>• Identify balanced and unbalanced forces on a diagram</li> <li>• Describe how balanced and unbalanced forces affect the movement of an object.</li> <li>• Calculate the resultant force of an object.</li> <li>• Describe the difference between weight and mass and why gravity changes on different planets</li> <li>• Calculate the weights of objects using their masses and gravitational field strength.</li> <li>• Correct some common misconceptions surrounding mass, weight and gravity.</li> </ul>

Key learning questions	Development Stage Science Term 2
	Healthy Diet
<p>Name all seven nutrient groups and explain the importance of each one.</p> <p>Identify the parts of the digestive system and explain the role of each organ.</p> <p>Explain how villi in the small intestine allow nutrients to be absorbed quickly into the bloodstream.</p> <p>Identify the main enzymes involved in digestion and state what they break down.</p> <p>Describe the methods used to test for starch, protein and fat in a food.</p>	<ul style="list-style-type: none"> <li>• Name the seven key nutrients a human requires.</li> <li>• Explain the importance of a balanced diet and why some nutrients are only required in small quantities.</li> <li>• Identify the main parts of the digestive system and explain their functions.</li> <li>• Explain how the adaptations of the small intestine help to increase the rate of absorption.</li> <li>• Identify the three main types of enzyme found in the digestive system.</li> <li>• Describe where the three main types of enzymes are found and produced in the digestive system.</li> <li>• Explain the importance of enzymes in digestion.</li> <li>• Carry out some basic food tests to identify foods rich in starch, protein and fat.</li> <li>• Calculate the BMI from provided data.</li> <li>• Describe some of the causes and effects of obesity, including lifestyle factors.</li> <li>• Recall what is meant by a deficiency disease and identify some examples.</li> </ul>



<p>Write out the formula for calculating BMI.</p> <p>Describe some of the causes and effects of obesity.</p> <p>Name some examples of deficiency diseases and state their causes and symptoms.</p>	<ul style="list-style-type: none"> <li>State some problems caused by imbalances in the diet, e.g. deficiency diseases.</li> </ul>
<p><b>Key learning questions</b></p>	<p><b>Separating Techniques</b></p>
<p>Define the terms 'mixture' and 'pure substance' and draw particle diagrams.</p> <p>Describe the method used to carry out chromatography and explain how a mixture is separated using this technique.</p> <p>Describe the method used to carry out filtration and evaporation and explain how a mixture is separated using this technique.</p> <p>Describe the method used to carry out distillation and explain how a mixture is separated using this technique.</p>	<ul style="list-style-type: none"> <li>Recall the definitions of a 'mixture' and a 'pure substance'.</li> <li>Draw particle diagram to represent mixtures and pure substances.</li> <li>Describe the method for carrying out paper chromatography.</li> <li>Explain how chromatography is used to separate a mixture.</li> <li>Describe how to carry out filtration and evaporation.</li> <li>Explain how filtering and evaporating can be used to separate a mixture.</li> <li>Describe the method used for carrying out simple distillation.</li> <li>Explain how simple distillation/fractional distillation can be used to separate a mixture.</li> </ul>
<p><b>Key learning questions</b></p>	<p><b>Levers, Moments &amp; Pressure</b></p>
<p>Draw an example of a lever and label the effort, load and pivot.</p> <p>Write out the formula for calculating a 'moment'.</p> <p>Identify some factors that affect the turning effect of a force.</p> <p>Write out the formula for calculating pressure.</p> <p>Describe some factors that affect the amount of pressure acting on a surface.</p>	<ul style="list-style-type: none"> <li>Identify an example of a lever and label the effort, load and pivot.</li> <li>Carry out an investigation to determine the factors affecting whether a seesaw is balanced.</li> <li>Calculate simple moments with the correct units using a calculation.</li> <li>Identify the factors that affect the turning effect of a force.</li> <li>Calculate the amount of pressure acting on a surface using the force and the area, giving the correct units.</li> <li>Describe the factors that will increase and decrease the pressure acting on a surface.</li> </ul>



Key learning questions	Development Stage Science Term 3
	Reproduction
<p>Describe the difference between the two types of reproduction, and give examples.</p> <p>Draw &amp; label the parts of a flower and describe what each part does.</p> <p>Describe the process of pollination.</p> <p>Name the human gametes (sex cells) and explain how they are adapted.</p> <p>Describe what happens at fertilisation.</p> <p>Describe what happens at each stage of the menstrual cycle.</p> <p>Describe the different stages of foetal development.</p> <p>Explain the roles of the placenta, umbilical cord and amniotic fluid.</p> <p>Outline the stages of child birth.</p>	<ul style="list-style-type: none"><li>• Describe the difference between asexual and sexual reproduction.</li><li>• Name organisms that use asexual reproduction, sexual reproduction or both.</li><li>• Recall the names of the parts of a flower and describe the role of each part.</li><li>• Describe what happens during pollination.</li><li>• Recall the names of the human male and female gametes (sperm and egg).</li><li>• Explain how the human gametes are adapted to carry out their function.</li><li>• Describe what happens at fertilisation.</li><li>• Describe the stages of the menstrual cycle.</li><li>• Describe the important milestones in foetal development.</li><li>• Explain the functions of the placenta, umbilical cord and amniotic fluid.</li><li>• Describe what happens during each stage of birth.</li></ul>
	Reactions
<p>Recall the order of the reactivity series and use this to determine whether a reaction will occur.</p> <p>Describe what a displacement reaction is, based on experimental observations.</p> <p>Write a word (and symbol) equation for a displacement reaction?</p> <p>Define the terms 'exothermic' and 'endothermic'.</p> <p>Define what a catalyst is and explain how it affects a reaction.</p> <p>Identify examples of chemical and physical changes.</p> <p>Identify what is needed for a combustion reaction and compare complete and incomplete combustion.</p>	<ul style="list-style-type: none"><li>• Recall the order of the elements in the reactivity series.</li><li>• Use the reactivity series to determine whether or not reactions will occur.</li><li>• Describe what is meant by a displacement reaction and carry out an investigation.</li><li>• Write word (and symbol) equations for displacement reactions.</li><li>• Define the terms 'exothermic' and 'endothermic'.</li><li>• Recognise examples of endothermic and exothermic reactions during an investigation.</li><li>• Define what a catalyst is.</li><li>• Observe the effect of a catalyst on a reaction.</li><li>• Identify and explain why a change is either chemical or physical.</li><li>• Identify what is needed for combustion</li><li>• Compare the differences between complete and incomplete combustion</li></ul>



<b>Movement &amp; Speed</b>	
<p>Write out the formula for calculating the speed of an object.</p> <p>Re-arrange this equation to calculate distance and time.</p> <p>Draw and label a distance-time graph to show your journey to school. Explain each change of motion.</p> <p>Use the words acceleration on deceleration to describe the movement of an object.</p>	<ul style="list-style-type: none"><li>• Calculate the speed of objects using the equation and a range of units</li><li>• Rearrange the speed equation finding distance travelled or time taken.</li><li>• Describe the motion of an object from a distance–time graph</li><li>• Describe the movement of objects which are accelerating or decelerating</li></ul>
<b>Space</b>	
<p>Describe what our solar system consists of.</p> <p>Create a mnemonic to remember the order of planets in our solar system.</p> <p>Compare a star and a planet?</p> <p>Describe the orbits of the moon and the earth.</p> <p>Describe why we have day and night.</p> <p>Explain why we have seasons?</p> <p>Describe what a galaxy is and name our galaxy.</p> <p>Explain how space can be observed using different methods?</p>	<ul style="list-style-type: none"><li>• Describe the structure of the solar system in simple terms.</li><li>• List the order of the planets by distance from the sun.</li><li>• Describe evidence for the rotation of the Sun.</li><li>• Compare a star and a planet.</li><li>• Describe the motion of the Moon relative to the Earth and Sun.</li><li>• Describe the rotation of the earth and use this to describe day and night.</li><li>• Explain the seasons in terms of the tilt of the earth’s axis.</li><li>• Describe a galaxy as a vast collection of stars held together by gravity.</li><li>• State that the Universe contains billions of galaxies.</li><li>• Explain how space can be observed using artificial satellites, space telescopes, space probes and human exploration.</li></ul>