



St Joseph's RC Middle School

Science Overview

Topic	Autumn		Spring		Summer		
	1	2	1	2	1	2	
	<b>Introduction to the laboratory Energy</b>	<b>Acids and Alkalis Particle Theory</b>	<b>Cells Solutions</b>	<b>Chemical Reactions Reproduction</b>	<b>Earth and Atmosphere</b>	<b>Interdependence</b>	<b>Waves</b>
Areas of curriculum covered	<p>Compare energy values of different foods (from labels kJ)</p> <p>Compare power ratings of appliances in watts (W, kW)</p> <p>Calculate and compare amounts of energy transferred (J, kJ, kW hour)</p> <p>Access domestic fuel bills, fuel use and costs.</p> <p>Compare fuels and consider renewable and non-renewable energy resources</p> <p>Define the term energy as the ability to do work</p> <p>Consider the energy as the ability to do work.</p> <p>Consider energy as a quantity that can be quantified and calculated</p> <p>Explain why the total energy has the same value before and after a change</p> <p>Explain changes with temperature in the motion and spacing of particles</p>	<p>Describe the different states of matter in terms of arrangements, motion and closeness of particles</p> <p>Explain changes of state in terms of energy</p> <p>Calculate density from mass and volume data</p> <p>Explain diffusion in liquids and gases driven by differences in concentration.</p> <p>Consider gas pressure in terms of particles and apply their understanding to different phenomena including vacuums.</p> <p>Appreciate the importance of the observation of Brownian motion in gases.</p> <p>Define acids and alkalis in terms of neutralisation reactions.</p>	<p>Identify cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope.</p> <p>Explain the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts.</p> <p>Compare the similarities and differences between plant and animal cells.</p> <p>Explain the role of diffusion in the movement of materials in and between cells</p> <p>Describe the structural adaptations of some unicellular organisms (sex cells, ciliated cells, root hair cells, blood cells)</p> <p>Describe the hierarchical organisation of multicellular organisms (cells, tissues, organs, systems to organisms)</p> <p>Explain the concept of a pure substance</p> <p>Use the terms saturated and solubility to describe how different substances may dissolve in water</p> <p>Use the key terms dissolve solute, solvent and solution</p> <p>Undertake simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography.</p> <p>Describe how to identify pure substances (from their particle models, boiling points, chromatography etc)</p>	<p>Describe reproduction in humans, including the structure and functions of the male and female reproductive systems</p> <p>Explain the stages of the menstrual cycle</p> <p>Describe the formation of gametes and process of fertilisation</p> <p>Identify the main stages in gestation and birth</p> <p>Consider the effect of maternal lifestyle on the foetus through the placenta</p> <p>Research the effects of recreational drugs (including substance misuse) on behaviour, health and life processes (covered as a part of pregnancy in reproduction)</p>	<p>Describe the composition of earth</p> <p>Recall the structure of the Earth</p> <p>Describe the rock cycle and the formation of igneous, sedimentary and metamorphic rocks</p> <p>Consider Earth as a source of limited resources and the efficacy of recycling</p> <p>Recall the composition of the atmosphere</p> <p>Consider the production of carbon dioxide by human activity and the impact on climate</p>	<p>The interdependence of organism in an ecosystem, including food webs, and insect pollinated crops</p> <p>The importance of plant reproduction through insect pollination in human food security</p> <p>How organisms affect and are affected by their environment including the accumulation of toxic materials</p>	<p>Sound needs a medium to travel, the speed of sound in air, in water, in solids</p> <p>Sound produced by vibrations of objects in loud speaker, deduced by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal</p> <p>Auditory range of human.</p> <p>The similarities and differences between light waves and waves in matter</p> <p>Light waves travelling through a vacuum; speed of light</p> <p>The transmission of light through materials; absorption, diffuse scattering and specular reflection at a surface</p> <p>The refraction of light and action of convex lens in focusing (qualitative); the human eye</p> <p>Colours and the different frequencies of light, white light and prisms, differential colour effects in absorption and diffuse reflection</p>

Working Scientifically				
<p><b>Scientific Attitudes</b></p> <ul style="list-style-type: none"> <li>- Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility</li> <li>- Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas together with the importance of publishing results and peer review.</li> <li>- Evaluate risks in experimental investigations including the use of CLEAPPS hazards.</li> </ul>	<p><b>Experimental Skills and Investigations</b></p> <ul style="list-style-type: none"> <li>- Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience</li> <li>- Make predictions using scientific knowledge and understanding</li> <li>- Select plan and carry out the most appropriate types of scientific enquiries to test predictions including identifying in depended, depended and control variables, where appropriate.</li> <li>- Use appropriate techniques apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.</li> <li>- Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements</li> <li>- Apply sampling techniques</li> </ul>	<p><b>Analysis and evaluation</b></p> <ul style="list-style-type: none"> <li>- Apply mathematical concepts and calculate results</li> <li>- Present observations and data using appropriate methods, including tables and graphs</li> <li>- Interpret observations and data, including identifying patterns and using observations measurements and data to draw conclusions.</li> <li>- Present reasoned explanations, including explaining data in relation to predictions and hypotheses.</li> <li>- Evaluate data, showing awareness of potential sources of random and systematic error.</li> <li>- Identify further questions arising from their results</li> </ul>	<p><b>Measurement</b></p> <p>Understand and use SI units and chemical nomenclature</p> <p>Use and derive simple equations and carry out appropriate calculations</p> <p>Undertake basic data analysis including simple statistical techniques</p>	

Year 7