



'An ambitious curriculum that meets the needs of all'

## Medium Term Planning - Topic: Particle Model

<b>Curriculum Intent</b>	
<b>Skills/National Curriculum Links</b>	<p>In addition to working further on objectives from Year __, pupils will be taught, following National Curriculum guidelines, the following this topic:</p> <p>The particulate nature of matter</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, including gas pressure</li><li>changes of state in terms of the particle model.</li></ul>
<b>Spiritual, moral, social, and cultural development</b>	<p><b>SMSC:</b> This unit of work provides several opportunities for students to work together practically in groups, which encourages them to share views and opinions and take instructions from others. Group work opportunities encourage teamwork and respect for others. In practical lessons students follow laboratory rules for the safety of all. Thinking about why scientists develop models and how they can be useful in the communication of scientific ideas.</p> <p><b>PSHE/British Values:</b> The particle model helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft. Students will complete teamwork, leadership and put science into everyday situations. They will show mutual respect during classwork.</p> <p><b>Skills Builder:</b> Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork</p>
<b>Numeracy</b>	Melting and boiling points including minus degrees centigrade.
<b>Literacy</b>	<p><b>Vocabulary Tier 2:</b> material, mixture, pure, identical, substance, describe, arrangement, compress, transferring, observation, increase, decrease, factors, evidence, random, motion, collide, representation.</p> <p><b>Vocabulary Tier 3:</b> material, particle, mixture, substance, property, particle model, density, solid, liquid, gas, states of matter, melt, change state, freeze, melting point, boil, boiling point, evaporate, evaporation, condense, condensation, sublime, sublimation, diffusion, gas pressure, prediction.</p> <p><b>Reading:</b> Following a written method and reading multi-sentence questions. Reading risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle.</p> <p><b>Writing:</b> Describing and explaining scientific phenomenon, free response writing for describing precautions taken. Use of word mat to promote sentence formation. Converting diagrams into text.</p> <p><b>Oracy:</b> Inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.</p>
<b>Becoming future ready</b>	<p><b>Careers/Employability:</b></p> <p>Recycling</p> <p>Waste Management</p> <p>Food scientist</p> <p>Chemist</p> <p>Pharmacist</p> <p>Material scientist</p>
<b>Adaptation</b>	Throughout this topic, quality first teaching will provide differentiation:



<b>QFT/SEND Provision</b>	<p><b>By product:</b> Linear assessments and differentiated practical work.</p> <p><b>By resource:</b> Lessons are differentiated per class and students, worksheets are coloured blue if st assessments are linear.</p> <p><b>By Intervention:</b> by providing different levels of supervision and support</p> <p><b>By Progressive Questioning:</b> exploring pupils' understanding through interactive dialogue.</p> <p><b>By Grouping:</b> according to prior attainment, gender, social preference, preferred learning style.</p> <p><b>By Task:</b> Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>
<b>Implementation Curriculum Delivery</b>	<p>To be able to:</p> <p>Securing Mastery Goals</p> <ul style="list-style-type: none"><li>● 3.5.1 Explain the properties of solids, liquids and gases based on the arrangement and movement of their particles.</li></ul> <p>Enquiry processes</p> <ul style="list-style-type: none"><li>● 2.6 Suggest a scientific idea that might explain an observation.</li></ul> <p>Enquiry processes activity</p> <ul style="list-style-type: none"><li>● 3.5.1 Relate the features of the particle model to the properties of materials in different states.</li></ul> <p>Securing Mastery Goals</p> <ul style="list-style-type: none"><li>● 3.5.1 Explain the properties of solids, liquids and gases based on the arrangement and movement of their particles.</li></ul> <p>Exceeding Mastery Goals</p> <ul style="list-style-type: none"><li>● 3.5.1 Argue for how to classify substances which behave unusually as solids, liquids or gases.</li></ul> <p>Enquiry processes</p> <ul style="list-style-type: none"><li>● 2.3 Make a conclusion and explain it.</li></ul> <p>Securing Mastery Goals</p> <ul style="list-style-type: none"><li>● 3.5.1 A substance is a solid below its melting point, a liquid between its melting and boiling points, and a gas above its boiling point.</li><li>● 3.5.1 Explain changes in states in terms of changes to the energy of particles. ● Draw before and after diagrams of particles to explain observations about changes of state, gas pressure, and diffusion.</li></ul> <p>Enquiry processes</p> <ul style="list-style-type: none"><li>● 2.4 Select a good way to display data.</li><li>● 2.4 Draw line graphs to display relationships.</li></ul> <p>Securing Mastery Goals</p> <ul style="list-style-type: none"><li>● 3.5.1 Explain unfamiliar observations about gas pressure in terms of particles.</li><li>● 3.5.1 Draw before and after diagrams of particles to explain observations about changes of state, gas pressure, and diffusion.</li><li>● 3.5.1 Make predictions about what will happen during unfamiliar physical processes, in terms of particles and their energy.</li></ul> <p>Enquiry processes</p> <ul style="list-style-type: none"><li>● 2.3 Make a conclusion and explain it.</li><li>● 2.3 Judge whether the conclusion is supported by the data.</li></ul> <p>Red denotes interleaving; aspects of knowledge covered previously.</p>
<b>Current learning to be developed in the future within:</b>	<p><b>Future Learning:</b></p> <p>The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life. At GCSE you will understand how the movement of particles affects if a substance is a solid, liquid or gas.</p>
<b>Assessment</b>	<p>Refer to assessment maps for formative and summative assessment opportunities.</p>
<b>Impact</b>	<p>Attainment and Progress – Refer to assessment results / data review documentation.</p>