



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
<p><b>Introduction to GCSE specification requirements</b></p> <p>Designing to a brief</p> <p>Material properties</p>	<p>To understand the content and requirement of the D&amp;T GCSE specification.</p> <p>To understand how to analyse a design context to develop relevant and innovative design ideas.</p> <p>To investigate the working properties of thermos-forming polymers.</p>	<p>Iterative</p> <p>Context</p> <p>Polymer</p> <p>Thermo-forming</p> <p>Thermosetting</p>	<p>Students will be introduced to the specification content and mark scheme. This will allow them to highlight early on areas they individually may find more challenging.</p> <p>Students will analyse a given design context and conduct in depth research led by their own direction to develop their ideas.</p> <p>Students will investigate the properties of acrylic (PMMA) and other thermos-forming polymers to test suitability for their design.</p>	<p>Science - polymers, properties and characteristics of materials</p> <p>Art - creativity</p> <p>Engineering - innovation</p>	<p>Initial highlighting of personal learning checklists (PLC).</p> <p>Exam questions on thermoforming and thermosetting polymers.</p> <p>Exam questions on iterative designing.</p>
<p><b>Technical drawings</b></p> <p><b>CAD modelling</b></p>	<p>To develop skills in using isometric and orthographic projection.</p> <p>To develop competency in CAD modelling and rendering.</p>	<p>Isometric</p> <p>Orthographic</p> <p>Plan</p> <p>Render</p> <p>CAD model</p>	<p>Students will create their design sketches using isometric projection.</p> <p>From these students will create orthographic (working/plan) drawings that could be shown to third parties to convey their ideas professionally.</p> <p>Students will create a CAD model of their final idea using industry standard computer aided design software.</p>	<p>Engineering - working drawings</p> <p>Maths - drawing to scale</p>	<p>Isometric drawing challenge - students will create isometric drawings from complex orthographic projections.</p>
<p><b>Soldering a circuit</b></p> <p><b>Joining acrylic</b></p>	<p>To be able to identify and select appropriate electronic components.</p> <p>To develop soldering skills.</p> <p>To understand the process of joining polymers to assemble product.</p>	<p>Solder</p> <p>Soldering iron</p> <p>Printed circuit board (PCB)</p> <p>Solvent cement</p>	<p>Students will investigate a range of electrical components and their uses.</p> <p>Students will build and solder an LED circuit including a resistor, switch and power supply.</p>	<p>Electronics -soldering, circuit building, PCBs, resistors, LEDs, switches, power supplies, ohms, currents.</p> <p>Maths - calculating resistor values</p>	<p>Pre-reading: research in to difference between soft and hard soldering and their uses.</p> <p>Writing a manufacturing specification.</p>



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<p><b>Practical skills working with polymers.</b></p> <p>Methods of forming and shaping thermosetting and thermosforming polymers.</p> <p>Polymer properties.</p>	<p>To understand the working and physical properties of different polymers.</p> <p>To be able to select the appropriate polymers for different forming methods or products.</p> <p>To demonstrate the forming of polymers.</p>	<p>Thermosetting</p> <p>Thermoforming</p> <p>Injection moulding</p> <p>Vacuum forming</p> <p>Blow moulding</p> <p>Compression moulding</p> <p>Extrusion moulding</p> <p>Fractional distillation</p> <p>Properties</p>	<p>Students will investigate the properties of polymers using a variety of testing methods. They will use the results from this testing to evaluate their effectiveness for use in different products.</p> <p>Students will apply this knowledge to extended examination questions.</p> <p>Students will undertake practical tasks such as vacuum forming, line bending, 3D printing, laser cutting and injection moulding.</p>	<p>Science - material properties</p> <p>Engineering - how and why things work</p> <p>English - writing extended written responses</p> <p>Maths - analysing data</p>	<p>Examination questions on polymers.</p> <p>Wider reading on the impact of polymers on the world around us.</p> <p>Examination questions on forming methods.</p>
<p><b>Practical skills working with timbers and boards.</b></p> <p>Preparation processes of raw materials to workable boards.</p> <p>Timber and board properties.</p>	<p>To understand the working and physical properties of natural timbers and manufactured boards.</p> <p>To be able to select the appropriate timbers and boards for different processes or products.</p> <p>To demonstrate the joining of different timbers and boards.</p>	<p>Timber</p> <p>Manufactured boards</p> <p>Felling</p> <p>Seasoning</p> <p>Conversion</p> <p>Deforestation</p> <p>Forest Stewardship Council (FSC)</p>	<p>Students will investigate the properties of timbers and boards using a variety of testing methods. They will use the results from this testing to evaluate their effectiveness for use in different products.</p> <p>Students will apply knowledge of seasoning and conversion to extended examination questions.</p> <p>Students will demonstrate wood joints such as finger joints, housing joints, mitre joints and cross-halving.</p>	<p>Science - material properties</p> <p>Engineering - how and why things work</p> <p>Geography - deforestation, felling</p> <p>English - writing extended written responses</p> <p>Maths - analysing data</p>	<p>Examination questions on production processes used on timbers and boards.</p> <p>Examination questions on joining methods and workshop safety.</p>



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<p><b>Practical skills working with metals.</b></p> <p>Ferrous and non-ferrous metal uses.</p> <p>Ferrous, non-ferrous and alloy properties.</p>	<p>To understand the working and physical properties of ferrous and non-ferrous metals.</p> <p>To demonstrate the process of casting.</p>	<p>Alloy</p> <p>Ferrous</p> <p>Non-ferrous</p> <p>Casting</p> <p>Welding</p>	<p>Students will investigate the properties of ferrous and non-ferrous metals using a variety of testing methods. They will use the results from this testing to evaluate their effectiveness for use in different products. Students will produce a cast pewter product.</p>	<p>Science - material properties</p> <p>Engineering - how and why things work</p> <p>English - writing extended written responses</p> <p>Maths - analysing data</p>	<p>Examination questions on ferrous and non-ferrous metals.</p>