



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
<p>Iterative thinking</p> <p>Prototyping and modelling</p>	<p>To understand the concept of iterative designing.</p> <p>To design and model various products that include a live hinge feature.</p> <p>To build a 3D prototype of one initial design idea using a 2D net of own creation.</p>	<p>Live hinge</p> <p>Form</p> <p>Proportion</p> <p>Prototype</p> <p>2D Design</p> <p>Net</p>	<p>Students will learn about iterative designing, and why it is important, through a series of discussion tasks and real-life examples.</p> <p>Students will conduct research and testing on live hinges and the capabilities of different materials such as timbers and polymers.</p> <p>Students will design innovative products that must include a live hinge.</p> <p>Students will build a 3D prototype to test their best product idea.</p>	<p>Engineering - functionality of a product for its intended use</p> <p>Art - considering form/shape</p> <p>Maths - scale and proportion, measuring</p>	<p>Survey and questionnaires for target user about initial designs.</p> <p>Analysing survey results, justifying how they will be used to improve proposed product.</p>
<p>Computer Aided Designing (CAD)</p> <p>Computer aided manufacture (CAM)</p>	<p>To be able to translate 3D measurements to 2D computer design software.</p> <p>To utilise the use of CAM to produce high quality products.</p> <p>To understand the impact of computer aided manufacture on society and the economy.</p>	<p>2D Design</p> <p>Laser cutter</p> <p>Etching</p> <p>CAM</p> <p>Social impact</p> <p>Industry</p>	<p>Students will translate 3D prototypes to a 2D net of their product on complex computer design software.</p> <p>Students will develop their ideas as they work, continually testing and experimenting with different outcomes.</p> <p>Students will export their 2D computer files to be cut by the laser</p>	<p>Maths - translating of complex measurements from a 3D shape to a 2D net, plotting, tessellation.</p>	<p>Research on scales of production and the impact of CAD CAM on the design and manufacturing industries.</p> <p>Exam questions.</p>
<p>Assembling a final live hinge product</p>	<p>To be able to apply knowledge of 3D form and structure to assemble a successful live hinge product.</p> <p>To effectively evaluate your own product against a commercial product.</p>	<p>Manufacture</p> <p>CAM</p> <p>Tolerances</p> <p>Quality Control</p>	<p>Students will assemble their laser cut live hinge product.</p> <p>Students will need to use problem solving skills to independently assemble and adapt their final product to be fully functional.</p>	<p>Engineering - assembling separate working parts</p> <p>English - evaluating products</p>	<p>Presentation of final product prepared to be delivered to peers.</p>



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<p>The 6Rs</p> <p>Sustainable design</p>	<p>To be able to evaluate the effectiveness of the use of the 6Rs in existing products.</p> <p>To suggest developments to existing products / companies to allow for a more sustainable future.</p>	<p>Reduce</p> <p>Reuse</p> <p>Recycle</p> <p>Rethink</p> <p>Repair</p> <p>Refuse</p> <p>Planned obsolescence</p> <p>Sustainability</p>	<p>Students will investigate each of the 6Rs and conduct an in depth analysis of existing products' impact on the environment.</p> <p>A hands-on approach will allow students to see the real-life impact of planned obsolescence and the use of non-renewable materials. This will allow them to develop real-life solutions to barriers currently preventing a sustainable future.</p>	<p>Geography - environmental issues, sustainability.</p> <p>English - public speaking, presentation delivery, articulating coherent responses to peer questions.</p>	<p>Research homework on the effect of plastics on the environment.</p>
<p>Investigate, design and make</p>	<p>To investigate appropriate responses to a design context.</p> <p>To develop relevant and effective design solutions to a design problem.</p> <p>To apply skilful practical processes to manufacture an environmentally-friendly and functional prototype.</p>	<p>Natural timber</p> <p>Manufactured board</p> <p>Wastage</p> <p>Costing</p> <p>Tolerance</p> <p>Component</p>	<p>Students will analyse a design context centred on sustainable design.</p> <p>Students will design a range of products to fulfil their brief, critically evaluating their ideas against their ongoing research as they work.</p> <p>Students will build 3D prototypes for their ideas and test in use.</p>	<p>Science - working and physical properties of materials.</p> <p>Engineering - developing solutions to problems.</p> <p>Art - creativity in design.</p> <p>Maths - calculating tolerances, wastage, area, volume and the costing of materials.</p>	<p>Maths questions calculating the nesting, wastage and costings of materials needed.</p>
<p>Carbon footprint</p> <p>Environmental impacts</p>	<p>To critically evaluate the effect of a product on the environment from obtaining raw materials to the end of product life.</p> <p>To develop innovative ways to combat the environmental impact of products.</p>	<p>Product lifecycle</p> <p>Carbon footprint</p> <p>Emissions</p> <p>Renewable</p> <p>Non-renewable</p>	<p>Students will evaluate their own and others' prototypes against their design brief and specification.</p> <p>They will analyse their proposed product's lifecycle and suggest improvements as necessary.</p>	<p>English - presentation delivery, written evaluations.</p> <p>Science - carbon emission, pollution.</p>	<p>Preparation of presentation of final prototype idea.</p> <p>Students must prepare a 3 minute presentation to inform potential manufacturers of their proposed prototype.</p>