



Topic Name	Term	Skills Developed	Link to NC Subject Content	Next link in curriculum	Other Notes
To develop a clear understanding of the types of mobile phone holders are available on the market and their common applications in modern society. Selecting designs for function and creativity. Pupils should be exposed to the design style ALESSI and gain an understanding of the design style, key players and significant influences and character.	Rotation 1	<ul style="list-style-type: none"> <li>• Primary research methods</li> <li>• Ability to design and select based upon creativity and enterprise.</li> <li>• Product analysis skills and application</li> <li>• Understand how designers create products for users</li> <li>• Understand that designs follow a style, this project focuses upon the Italian style ALESSI. Pupils must be capable of designing and working in the style of the ALESSI designers.</li> </ul>	<ul style="list-style-type: none"> <li>• Use research and exploration, such as the study of different cultures, to identify and understand user needs</li> <li>• Analyse the work of past and present professionals and others to develop and broaden their understanding</li> </ul>	<ul style="list-style-type: none"> <li>• Y8 Clock design</li> </ul>	Opportunity to handle ALESSI products from the collection box.
Students should measure their own mobile phones to collect anthropometric data. Measurement added to a working drawing, students to manufacture a 1:1 scale mobile phone for modelling purposes. Modelling ideas, using card pupils will design three suitable (3D) designs based upon the ALESSI theme. Pupil's models are used for peer assessment. Models are taken home, evaluated and appraised.		<ul style="list-style-type: none"> <li>• Data collection</li> <li>• Develop an understanding of anthropometrics and ergonomics</li> <li>• Ability to design objects to house a physical object</li> <li>• Measure and record with accuracy</li> <li>• Understand scale and proportion</li> <li>• Design in the style of ALESSI</li> <li>• Use peer assessment to gain opinions and guide development</li> <li>• Interaction with home/families</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and solve their own design problems and understand how to reformulate</li> <li>• Products that respond to needs in a variety of situations</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	



<p>Final idea. Using the feedback pupils should use a modelling skills to design a final idea that meets the design and manufacturing specification. The card model should represent 1:1 scale and include all dimensions. The constructed model should be deconstructed and converted into a 2d scaled drawing, showing all sizes, cut lines and engraving areas.</p>	<ul style="list-style-type: none"> <li>• Measuring skills</li> <li>• Scale diagrams</li> <li>• Understanding cut and engrave options</li> <li>• Produce a working drawing</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	
<p>Understand where and how materials are manufactured, focusing upon the material "Thermosetting plastic - <b>Acrylic</b>". Where does plastic come from, How is it processed, formed, sizes, stock form and cost. Pupils introduced to the concept of cutting, shaping, filing, drilling, edge finishing and folding acrylic sheet. Integral to this activity is the introduction and health and safety training for:</p> <ul style="list-style-type: none"> <li>• Pillar drill</li> <li>• Electric strip heater</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of how plastics are formed from crude oil, exploring sustainable and recycling, ability to explain the term commodity</li> <li>• Calculating the cost of the material size that the students are using</li> <li>• Demonstrate thorough practical exploration: cutting acrylic with hand tools, marking, edge finishing and drilling</li> <li>• Folding acrylic sheet to 45°</li> <li>• Successful practical outcome – Pencil holder to take home at the end of the lesson</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use specialist tools, techniques, processes, equipment and machinery precisely</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<p>Health and safety introduction as part of the lesson rather than separate lessons.</p>
<p>Introduction to Techsoft 2D. Understanding how CAD has replaced traditional design methods, pros and cons of CAD CAM. How to operate and draw simple shapes. Often this will link to designing the frontage of a house/object. Pupils are then taught</p>	<ul style="list-style-type: none"> <li>• Understand the CAD and CAM</li> <li>• Open and draw simple shapes using techsoft 2D design V2</li> <li>• Use simple drawing tools to design a simple house frontage</li> <li>• Save CAD files and retrieval</li> <li>• Understand how vector and bitmap images have been produced</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding how designs are converted to CAD drawings</li> </ul>	<p>Opportunity to demonstrate an alternative method of cutting a delicate</p>



<p>how to add an image and convert to a bitmap. Pupils are often will design a shape that can be rapidly cut out on the laser cutter. This introduces pupils to converting files to DXF files.</p>	<ul style="list-style-type: none"> <li>• Select a silhouette images to convert into a grey scale bitmap</li> <li>• Contour a bitmap and delete</li> <li>• Save and transfer design to the W drive and DXF format</li> <li>• Set up the laser cutter and understand how the machine functions</li> <li>• Take home a laser cut artefact</li> </ul>		<p>and then manufact ured. Links to Y8 clock project manufact uring section.</p>	<p>shape on the scroll saw would take time and skill often with errors and H&amp;S issues.</p>
<p>Transferring idea from card to CAD drawing. Pupils will use their card 2D model to transfer and convert to a drawing suitable for laser cutting. This lesson will focus upon setting up a work area, using drawing tools to produce a 2D outline applying red and black lines. Saving their work, converting to DXF format.</p>	<ul style="list-style-type: none"> <li>• Setting the design area to a defined space</li> <li>• Using new drawing tools</li> <li>• Explain the term “engraving”</li> <li>• Applying knowledge of red and black lines</li> <li>• Fault finding for errors</li> <li>• Saving and converting to DXF</li> <li>• Understanding how the laser cutter works</li> <li>• Understand the term tessellation</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and communicate design ideas using annotated sketches, detailed plans,</li> <li>• 3-D and mathematical modelling, oral and digital presentations and computer based tools</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<p>How this process would be completed if the laser cutter was broken.</p>
<p>Cutting and folding acrylic sheets. During the lesson pupils experience their work being cut, rather than just being given a cut out. Once the design cut the pupils must plan a logical and safe way to fold and bend the acrylic sheet. Templates and jigs are used to ensure consistency in angles and form. Recording of each stage should be recorded. The implementation of QC</p>	<ul style="list-style-type: none"> <li>• Safely use the strip heater to fold and bend acrylic into a desired shape or angle</li> <li>• Demonstrate understanding of how the material will react to heat, stress and pressure</li> <li>• Ability to use jigs to ensure consistency</li> <li>• Explain QC and QA</li> <li>• Explain the differences in batch and mass production</li> <li>• Explain why mass produced products are cheaper</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use a wider, more complex range of materials, components, taking into account their properties</li> <li>• Select from and use specialist tools, and machinery precisely, including computer-aided manufacture</li> <li>• understand and use the properties of materials and the performance of structural</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	



<p>and QA should be introduced and discussion raised regarding batch production.</p>			<p>elements to achieve functioning solutions</p>		
<p>Testing, evaluating and modifications. Learn how to test their practical work and make informed decisions to suggest improvement and modification to the design and manufacture. Compare against the specification and original design challenge. How does the design link to the ALESSI style? Demonstrate modification on the model and gain opinions from users and peers.</p>		<ul style="list-style-type: none"> <li>• Application of testing, devising a testing strategy</li> <li>• Apply analytical skills</li> <li>• Engage in peer assessment, inkling SWOT and six thinking hats</li> <li>• How to modify and adapt design based upon feedback</li> <li>• Suggest and make improvements</li> <li>• Provide evidence to support that the design follows the ALESSI style and Italian philosophy</li> <li>• Consider and address consumer concerns including end of life plan and sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	