



Topic Name	Term	Skills Developed	Link to NC Subject Content	Next link in curriculum	Next steps/prior learning
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.	R1-PD	• Primary research methods • Ability to design and select based upon creativity and enterprise. • Product analysis skills and application • Understand how designers create products for users • 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.	• Use research and exploration, such as the study of different cultures, to identify and understand user needs • Analyse the work of past and present professionals and others to develop and broaden their understanding	Y8 Clock design	Famous Designers-investigation
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		• Data collection • Develop an understanding of anthropometrics and ergonomics • Ability to design objects to house a physical object • Measure and record with accuracy • Understand scale and proportion • Design in the style of ALESSI	• Identify and solve their own design problems and understand how to reformulate • Products that respond to needs in a variety of situations	Y8 Clock design	Primary research task-phone measurements



used for peer assessment. Models are taken home, evaluated and appraised.		• Use peer assessment to gain opinions and guide development • Interaction with home/families			
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.		• Measuring skills • Scale diagrams • Understanding cut and engrave options • Produce a working drawing	• Modelling skills • Build essential CAD skills (2D Design tools the basics)	Y8 Clock design	Evaluate design idea.
Understand where and how materials are manufactured, focusing upon the material “Thermosetting plastic - Acrylic ”. Where does plastic come from, How is it processed, formed, sizes, stock form and cost.		• Understanding of how plastics are formed from crude oil, exploring sustainable and recycling, ability to explain the term commodity • Calculating the cost of the material size that the students are using	• Select from and use specialist tools, techniques, processes, equipment and machinery precisely		Strip heater demo (H&S).



		• Demonstrate thorough practical exploration: cutting acrylic with hand tools, marking, edge finishing and drilling • Folding acrylic sheet to 45° • Successful practical outcome – Pencil holder to take home at the end of the lesson			
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 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.		• Understand the CAD and CAM • Open and draw simple shapes using techsoft 2D design V2 • Use simple drawing tools to design a simple house frontage • Save CAD files and retrieval • Understand how vector and bitmap images have been produced • Select a silhouette images to convert into a grey scale bitmap • Contour a bitmap and delete • Save and transfer design to the W drive and DXF format • Set up the laser cutter and understand how the machine functions	• Build essential CAD skills (2D Design tools the basics)	• Understanding how designs are converted to CAD drawings and then manufactured. Links to Y8 clock project manufacturing section.	CAD/CAM quiz.



		Take home a laser cut artefact			
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.		- Setting the design area to a defined space - Using new drawing tools - Explain the term “engraving” - Applying knowledge of red and black lines - Fault finding for errors - Saving and converting to DXF - Understanding how the laser cutter works - Understand the term tessellation	- Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer based tools	Understanding how designs are converted to CAD drawings and then manufactured. Links to Y8 clock project manufacturing section.	CAD demo and tasks.
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		- Safely use the strip heater to fold and bend acrylic into a desired shape or angle - Demonstrate understanding of how the material will react to heat, stress and pressure - Ability to use jigs to ensure consistency - Explain QC and QA - Explain the differences in batch and mass production	- Select from and use a wider, more complex range of materials, components, taking into account their properties - Select from and use specialist tools, and machinery precisely, including computer-aided manufacture	Year 8 Clock Project.	Polymer shaping and forming (discuss other commercial options). Link to scale of production.



form. Recording of each stage should be recorded. The implementation of QC and QA should be introduced and discussion raised regarding batch production.		• Explain why mass produced products are cheaper	• understand and use the properties of materials and the performance of structural elements to achieve functioning solutions		
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.		• Application of testing, devising a testing strategy • Apply analytical skills • Engage in peer assessment, inkling SWOT and six thinking hats • How to modify and adapt design based upon feedback • Suggest and make improvements • Provide evidence to support that the design follows the ALESSI style and Italian philosophy • Consider and address consumer concerns including end of life plan and sustainability	• Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	Year 8 Clock Project.	Evaluation and extension tasks.



• Graphics Introduction • Health and Safety introduction Pupils introduced to the workshop and how to conduct themselves in this environment. Identification of tools, machinery, safety points and room conduct. Graphics introduction. Presentational skills and creative skills to design new and innovate products. Introduction to the chocolate project. Generating ideas to suit the demands of a charity or organisation.		• Production of a room plan, identifying machinery and safety points • Demonstrate creative skills, Application of walking on the wild side and 50 circles exercise • Risk taking with graphics, mistakes are good, design has no formal rules • Designers are not artists • Product analysis with six thinking hats • Understanding how charities work and how they raise funds through merchandising •	• Use a variety of approaches, such as biomimicry and user-centred design, to generate creative ideas develop and communicate design ideas using annotated sketches,	All sessions that require the workshop/tools and processes	Health and Safety
• Product Analysis • Mathematical Application Mould demonstration, investigate the features of a good and bad mould. Examples of moulds used. Investigation to find out how chocolate bars are manufactured in industry. Strong focus upon the packaging and legal information contained within packaging. • Chocolate bar product analysis activity including calculating the cost per gram.		• Identification of key parts of a chocolate mould • Understanding problem areas with moulds and finer detail • Understanding how rotational moulding manufactures hollow chocolate shapes • Batch production techniques and production planning times • Understanding the functions of packaging including demonstrating knowledge of barcode, weights, symbols, branding, logos, royal warrants, materials, printing process, fair trade and general history of chocolate packaging • Applying mathematical skills to find the price per gram, using	• Develop and communicate design ideas using mathematical modelling. • Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers and technologists	• All design-based projects at KS3 require analysis. Costing and power consumption, linking to the unit electricity in Physics.	ACCESS FM task



		maths to make informed decisions.			
Vacuum Forming Demonstration Vacuum forming demonstration. Pupils will be introduced to the vacuum forming machine and the range of plastics used. Pupils to learn about how the machine operates in preparation of them using the machine in subsequent lessons.					Health and Safety
Packaging students are required to design the packaging of their chocolate bar including the manufacturing costings. Pupils should refer back to the product analysis session.					Computer room required and access to PACKLANE



Practical Session – Mould manufacture Moulding design and vacuum forming practical session. Some groups may have the opportunity to use the laser cutter to make their own mould shapes depending upon room allocation, this would feed into the phone holder project Other learners will use or make their shapes and formers from a prescribed topic/theme.		- Select appropriate moulding tools - Ability to select the correct polymer - Demonstrate team work when using the vacuum former - Safely remove moulds and preparing for chocolate pouring and photographing			Health and Safety
Evaluation and Modifications 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 successful would this chocolate product be in the open market?		- Application of testing, devising a testing strategy, how easy is the chocolate to remove from the mould - Extending the product range - Apply analytical skills - Engage in peer assessment, inkling SWOT and six thinking hats - Suggest and make improvements Consider and address consumer concerns over sustainability and fair trade	Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	- More detailed evaluation skills will be developed in the phone holder project.	Important to note that evaluation skills are critical at all stages of the design process.



West Kirby
Grammar School

Curriculum Map – Year 7 - DT (2022-23)

