



KESTEVEN AND SLEAFORD HIGH SCHOOL

Year 8 Design & Technology RM Scheme of Learning

2 Terms - On Rotation

Intent – Rationale

Intent: Demonstrate an understanding of Health and Safety in the Resistant Materials workshop; develop practical hand skills use of a variety of workshop power tools, hand tools and equipment. Understand how research can be used to stimulate design ideas; how design movements, fashion and trends affect aesthetic design across a range of products; produce unique aesthetic designs with annotation; produce prototypes to finalise design decisions; produce a unique outcome using polymers; use understanding of making methods to explain sequence of manufacturing; analyse and evaluate an outcome with use of design criteria and others views; use prototypes to explore 2D to 3D design; convert 3D prototypes to 2D CAD; refine prototypes using CAD; use CAD/CAM to produce a 2D outcome capable of being converted to 3D; use thermoforming (Strip Heater) to produce an acrylic 3D outcome

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
<p>Introduction to CAD software TECHSOFT2D Design, Understanding of the principles of CAD/CAM, Understanding the limitations of the laser cutter, Understanding of Research, Design Brief, Design Criteria (specification), presenting design work, evaluating outcomes, understanding of planning stages of making, Understanding how to use a range of tools in the workshop in a safe & productive manner.</p>	<ul style="list-style-type: none"> • Y9 – Topic Use of prototypes and CAD/CAM, Functional & Aesthetic design • Y10 – Design and Technology GCSE • Y11 – Design and Technology GCSE
What are the links with other subjects in the curriculum?	What are the links to SMSC, British Values and Careers?
<ul style="list-style-type: none"> • Business Studies – understanding of automation in production • Art – Presentation, illustration and design 	<ul style="list-style-type: none"> • Use the coded help guides to complete this section
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developing mathematical skills?
<ul style="list-style-type: none"> • Independent research • Written instructions • Subject specific vocabulary <p>FROM THE LIBRARY <i>The Influence of design and technology on Everyday Life</i>; J.Gaff-909 <i>50 Beds-Innovations in designs and materials</i>; M. Byars-749 <i>Great Inventions</i>; Bennington, Harrison-608 <i>Inventors</i>; M. Goldsmith <i>Materials</i>; L Spilsbury-500</p>	<ul style="list-style-type: none"> • Measuring skills using a steel ruler • Average measurements • Mathematical problem solving • Geometric understanding



Year 8 Design & Technology RM Scheme of Learning

Year 1– Term 6 (2 Terms - On Rotation)

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?	
<p>Know Students will need to understand:- How to use a wider range of workshop tools independently; The properties and uses of acrylic; How acrylic can be wasted, formed and joined to create products; The working properties of acrylic and be able to ‘hand work’ acrylic.; How understanding external influences can assist in the generation of ideas; How to present detailed design ideas ; How CAD/CAM can be used to create aesthetic features; How functional criteria can be modelled using traditional modelling techniques; How CAD can be used to refine functional design criteria; How to use traditional modelling techniques to produce a prototype; How CAD/CAM can be used to produce 3D functional outcomes</p> <p>Apply Use a wide variety of power tools and hand tools in a safe and productive way. (Base material -Acrylic); Use hand techniques to cut, shape and finish acrylic; Design and make an individual product using a range of plastic changing techniques; Use investigation of design movements to assist in their consideration of ideas; Learn through the designing and making process to adapt and modify an outcome using a combination of strategies. Power tools, Hand techniques & CAD/CAM; Use CAD create and refine a 3D outcome; Use CAD as a method of 2D and 3D presentation and using a combination of techniques to design a functional outcome; Use CAD/CAM with a prototype to refine and produce a unique 3D outcome (CAD & Laser Cutter)</p> <p>Extend Use CAD/CAM to produce a 3D item using slot together technology</p>	
What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
<ul style="list-style-type: none"> • Aesthetic Design – Principle of producing a unique outcome with focus on aesthetic design • Design Movements – Understanding design influences, fashions & trends • Acrylic – Properties and uses, cutting, shaping and finishing. • Power Tools– Develop skills on Scroll Saw, Power Drill, Belt Sander • Hand Tools – A variety of tools to cut, shape & finish acrylic. Files, Coping Saw, Wet & Dry, Polish • Unique Annotated Designs – Individual aesthetic designs • Prototype – Understanding the purpose of producing models/prototypes • 2D to 3D Prototypes – the conversion of 2D models to 3D outcome • CAD – use of computer aided design for refining prototypes • CAM – understanding how computer aided manufacturing works • CAD/CAM – use of CAD/CAM to make products in acrylic • Thermoforming Acrylic – Line bending using the Strip Heater 	<p>Outcomes & Key work for assessment: Research; design specification; design work; design movements; aesthetic design features; practical skills and prototypes; finished product; diary of make; evaluation.</p> <p>Regular marking of class and homework.</p> <p>Mid Project Review</p> <p>Tracking points.</p> <ul style="list-style-type: none"> • Final Assessment of completed project.



KESTEVEN AND SLEAFORD HIGH SCHOOL



Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Project Introduction and principle of unique Aesthetic design applied to familiar products.	Students will learn about aesthetic design considerations and how they can be used to make a unique design	Understanding how consumer demand and influences can affect design	Introduce the concept of Aesthetic design using familiar examples of everyday products.
Outline of the clock project using examples and outlining the scope for unique aesthetic design	Students will learn to use their understanding of aesthetic design by considering how consumers chose products	Highlight how recent trends have influenced the design of products	Demo using examples of different designs can be created using the materials available
The use of acrylic as a resistant material. Acrylic, Vinyl	Students will learn how acrylic and vinyl can be used to create a design	Consider a wide range of previous products and understand all of the possibilities to adjust aesthetics of a product	Explanation of the properties and uses of acrylic. Creating shapes, adding layers, adding vinyl
Investigation of different design movements. Art Deco, Arts & Crafts + 1 of their choice – see worksheet.	Students will learn to identify the features associated with the different design movements	Look for other design movements to show how they have influenced design. Consider what national/international factors may have contributed to the designs	Students will produce presentation pages to show the main features of each of the design movements. Annotation to show the specific features
Consideration of themes Setting individual Design Criteria	Students will learn how to produce different unique designs	Produce a wider range of detailed ideas	Consideration of different themes (any) and review of how the design movements could influence shapes
Students given the format for producing Design ideas. Size, detail & annotation	Students will learn best methods for presenting their design ideas	Use a wide variety of design/presentation techniques	Demonstration of how to present design ideas. Focus on size, colour, presentation and annotation
Design ideas Reminder of workshop safety	Students will be reminded of the safe use of power tools and hand tools in the workshop	Seek one to one support for higher skilled making methods. Complexity using tools/techniques	Reminder of how to present design ideas. Focus on size, colour, presentation and annotation
Practical work: How to finish the edge of acrylic. 6 X 5cm test piece.	Students will learn the practical skills necessary for finishing the edge of acrylic	Produce high quality finish and understand how to evaluate the finish on their work or others work	Demonstration of how to finish the edge of acrylic. Cross file, draw file, scrape, wet & dry, polish
Practical practice.	Students will learn the practical skills necessary for finishing the edge of acrylic	Cut in half using a curved line on the scroll saw and finish the curved surfaces	Remind of how to finish the edge of acrylic. Cross file, draw file, scrape, wet & dry, polish
Cutting & Shaping acrylic. Examples and practice	Students will learn the practical skills necessary for cutting and shaping acrylic	Use scroll saws/coping saws for complex designs	Demonstration of how to cut & shape acrylic
Final Design proposal; Full size prototype.	Students will learn how to produce a full size prototype and understand the benefits	Add detailed explanation of the model	Demonstrate how to produce a full size model to test the design
Making the outcome	Students working on individual practical work	Produce high quality complex outcomes	Remind of workshop safety and support students as they work on their individual practical work.
Making the outcome	Students working on individual practical work	Produce high quality complex outcomes	Remind of workshop safety and support students as they work on their individual practical work.
Making the outcome	Students working on individual practical work	Produce high quality complex outcomes	Remind of workshop safety and support students as they work on their individual practical work.
Making the outcome	Students working on individual practical work	Produce high quality complex outcomes	Remind of workshop safety and support students as they work on their individual practical work.
Making the outcome	Students working on individual practical work	Produce high quality complex outcomes	Remind of workshop safety and support students as they work on their individual practical work.
Diary of make – methods used and sequence	Students will learn how to show methods of making and the importance of sequence	Highlight the sequence of making and indicate where testing/quality control might be useful	Explain how students should record methods used and the sequence of manufacture
Evaluating the outcome	Students will learn how to evaluate an outcome against design criteria and the value of others views when evaluating an outcome	Seek several others views and suggest several modifications based on others views	Explain how to use design criteria in the evaluation of an outcome. Explain the value of other peoples views when evaluating an outcome

KESTEVEN AND SLEAFORD HIGH SCHOOL



Introduce project 2; A 17cm X 5cm storage project	Via demonstration students will learn how to produce card and paper models	Consider how the same surface area can be used on different shapes	Introduce the project 2. Explain using an example how prototypes can be made 2D for 3D outcomes
How to make 2D prototypes for 3D products	Students will learn how to produce card and paper models	Range of different prototypes with evaluation of each	Remind of CAD. Explain CAD/CAM
Use of CAD for refining a 2D model	Students will be reminded of the CAD software and learn how it can be used for refining designs	Use a wide range of CAD features	Demonstrate the features of CAD for refining designs
Thermoforming; how to use the strip heater for bending acrylic	Students will learn through practice how to thermoform acrylic on the stripheater	Develop high level skills in forming acrylic	Demonstrate how the use the strip heater. Students to use scrap pieces to learn the technique
Use of CAD/CAM for making an acrylic product	Students will learn how to use CAD/CAM	Understand what role CAM plays in commercial manufacturing	Explain how students can use their CAD designs for CAM – laser cutter