

Curriculum Overview: YEAR 9: Design & Technology: Resistant Materials

Rationale:

To provide students with experiences in a range of materials and with a range of processes making them aware of the practical life skills they can utilise in their own lives and gain an appreciation of how products are manufactured wide scale in an industrial context. To develop a knowledge of materials, skills and processes combined with enriched communication skills to be creative in solving problems and developing a solution or product for a target market.

Term / Length of Unit	Outline	Assessment	Home Learning	Resources	Reading	Knowledge/Skills End Points
8 Weeks	<p>Introduction to the course, expectations and key Top Tips.</p> <p><u>Module Content: Practical Skills – Familiarisation with tools, Equipment and Materials.</u></p> <p><u>Manufacturing – Skill Based Products</u></p> <p><u>Frame - Timber</u></p> <p>Measuring and marking out</p> <p>Cutting mitre joints, measuring and cutting intersects.</p> <p>Assembly of completed frame to drawing allocated.</p> <p><u>Turtle – Timber & Polymers</u></p> <p>Marking out using a template, drilling using a Forstner bit, accurate cutting of a shape, creating draft angles, moulding a shell, vacuum forming.</p> <p><u>Jellyfish – Timbers</u></p> <p>Creating friction fit cut outs using two tone timbers. Shapes must fit inside each other accurately.</p> <p><u>Whale – Timbers & Polymer</u></p> <p>Using a template draw around the shape, cut external and internal shapes accurately. Add acrylic laser cut fish to friction fit.</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR Assessment 1 – Frame Manufacture</p> <p>FAR Assessment 2 - Whale</p> <p><u>Assessing;</u></p> <p>Accuracy of measuring. Accuracy of cutting. Accuracy or assembly.</p>	<ol style="list-style-type: none"> Timber Families and identification of timbers Timbers Exam Question Finishes of timbers 	<p><u>Introduction to course</u></p> <p>PPT Introduction to course Skills booklet Skills power point</p> <p><u>Worksheets;</u></p> <p>Activity 1 – Vacuum forming Activity 2 – Vacuum forming exam Questions Activity 3 – Softwoods v Hardwoods</p> <p><u>Frame – Timber</u></p> <p>Softwood Strips MDF Strips Hardboard Hand Tools, Small machinery.</p> <p><u>Turtle – Timber/Polymers</u></p> <p>MDF LD Polystyrene Plasticine Hand Tools, Small machinery, Vacuum Former.</p> <p><u>Jellyfish – Timbers</u></p> <p>Softwood/Hardwood Hand Tools, Small machinery,</p> <p><u>Whale – Timbers & Polymers</u></p> <p>Softwood Acrylic Hand Tools, Small machinery,</p> <p><u>Theory Lessons</u></p> <p>Introduction to Timbers Sources and processing of timbers Processes and finishes of using timbers.</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>Following on from the completion of this unit, students should be able to identify a range of tools and equipment, select the appropriate tool/equipment for each material and range of tasks. Students will have developed the confidence and competence to use a range of tools, equipment and machinery safely and accurately. Ideally they will have picked up a range of skills that they can use in life beyond school.</p> <p>Students should be able to use the following tools and equipment effectively;</p> <p>Steel Rule Square Tenon saw Mitre saw Scroll saw Hammer Pedestal drill, Forstner bit File Vacuum Former</p> <p>Have a knowledge of; Different types of timbers and their properties. How Timbers are processed to be used in industry Methods of shaping and forming timbers. Finishes and Decoration of timbers.</p>
7 Weeks	<p><u>Module Content: Practical Skills – Familiarisation with tools, Equipment and Materials...contd...</u></p> <p><u>Manufacturing – Skill Based Products</u></p> <p><u>Fish – Metal</u></p> <p>Using a template, cutting out external shape using tin snips, filing edges to create a smooth finish. Surface decoration through planishing and texturised hammering.</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR Assessment 3 – Fish</p> <p>FAR Assessment 4 – Starfish</p> <p><u>Assessing;</u></p> <p>Accuracy of measuring. Accuracy of cutting. Accuracy or assembly.</p>	<ol style="list-style-type: none"> Metal Research task – Casting Processes. Joining metals Exam Question 	<p><u>Fish – Metal</u></p> <p>Aluminium</p> <p>Scriber Tin snips File Planishing hammer Planishing Anvil Ball peen hammer</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>Following on from the completion of this unit, students should be able to identify a range of tools and equipment, select the appropriate tool/equipment for each material and range of tasks. Students will have developed the confidence and competence to use a range of tools, equipment and machinery safely and accurately. Ideally they will have picked up a range of skills that they can use in life beyond school.</p> <p>Students should be able to use the following tools and equipment effectively;</p> <p>Scriber Tin Snips Engineering vice File Planishing hammer Planishing Anvil Ball peen hammer Wire Wool Forge</p>

	<p>Seahorse – Timber and Metal</p> <p>Using a forge to melt pewter and pour into a mould. Filing and finishing.</p> <p>Starfish – Polymer</p> <p>Using precut shapes, adhering shapes together using Tensol adhesive. Filing and shaping the design to create a high sheen finish.</p>			<p>Seahorse – Timber and Metal</p> <p>MDF - Mould Pewter Forge - Casting</p> <p>Starfish – Polymers</p> <p>Acrylic Hand Tools, Small machinery,</p> <p>Theory Lessons</p> <p>Introduction to metals Metal Processing Metal working processes Finishes of metals.</p>		<p>Gas torch Mould Crucible Hack saw</p> <p>Have a knowledge of;</p> <p>Metals and their properties Metal manufacturing processes Metal Finishing methods and protection.</p>
6 weeks	<p>Introduction to the course, expectations and key Top Tips.</p> <p>Module Content: Communication</p> <p>Designing and prototyping</p> <p>Graphics skills;</p> <ul style="list-style-type: none"> · Sketching in 3D - drawing skills, crating, isometric layout and 3D development. · Rendering - Developing skills in tonal rendering, using colour and texture closely reflecting a variety of materials. · Creative design task - Haphazard Designing. Design tool to show unusual and inventive shapes. · Modelling skills - techniques in manufacture and finishing. · Prototype modelling using Styrofoam. · Formal Drawing Techniques - Demonstration and use of isometric, orthographic drawings. 	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>Far Assessment 5 – Haphazard Designing</p> <p>Assessing;</p> <p>Graphics skills, sketching, drawing in 3D, rendering.</p> <p>Creative Designing</p> <p>Modelling and prototyping in Styrofoam.</p>	<ol style="list-style-type: none"> 1. Sketching and Rendering Products. 2. Product Development Report. 3. Sustainability Exam Question 	<p>Graphic Skills</p> <p>PPT Rendering techniques</p> <p>Worksheets;</p> <p>Activity 1 – Rendering Textures 1 Activity 2 – Rendering Textures 2 Activity 3 – Shading techniques and textures.</p> <p>Home Learning – Sketching and rendering</p> <p>Products</p> <p>Theory Lessons</p> <p>Introduction to the GCSE: Design & Technology course PPT – Product Sustainability Product Sustainability 1 – Sustainable Design Starter and worksheets. Product Sustainability 2</p> <p>Materials & Equipment</p> <p>Graphic equipment Styrofoam</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>To have a bank of tools for presenting ideas and creating ideas, including methods of rendering materials. Development of sketching skills to communicate ideas effectively. To be able to use a range of modelling materials to create prototypes.</p>
5 weeks	<p>Understanding Designer Influences</p> <p>Design Styles & Designers</p> <p>Alessi - Creative Design Task</p> <ul style="list-style-type: none"> · Understanding the Alessi design concept and style. · Analysing a range of products. · Creative designing. · Prototyping a product in the style of Alessi. <p>Key Skills;</p> <p>Creative prototyping.</p> <p>Mini Project;</p> <p>Red/Blue Chair - Practical</p> <p>Introduction to Design Styles. Art Deco, Art Nouveau, Memphis and De-Stijl.</p>	<p>Individual teacher comments and feedback throughout.</p> <p>FAR ASSESSMENT 6 – Alessi Design Challenge</p> <p>Assessing;</p> <p>An understanding of Alessi and Alessi Products</p> <p>Designing in the style of Alessi</p> <p>Modelling an Alessi styled product.</p> <p>FAR ASSESSMENT 7 –</p>	<ol style="list-style-type: none"> 1. Product Analysis – Alessi Product – ACCESSFM criteria 2. A fact file page on De-Stijl. 	<p>Introduction to Design movements</p> <p>PPT Introduction to Design movements Introduction to Design movements - worksheet</p> <p>Alessi Lessons</p> <p>PPT Product Analysis Product Analysis – worksheet Tiger and Alessi products PPT Alessi Lesson Alessi Design Page Alessi Final Design Page Plasticine Home learning – Alessi Product Design page</p> <p>De Stijl – Skills Challenge – Rietveld Chair</p> <p>PPT Skills Challenge – Rietveld Chair Home learning – De Stijl ICT Poster</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>To have an understanding of a range of different design movements and design companies.</p> <p>To be able to link design movements to their design criteria and be able to identify products from each movement.</p> <p>To be able to design and manufacture products in the style of a chosen movement.</p> <p>To be able to model and prototype in developing a range of design proposals.</p>

	<p>Focus on key designer Gerrit Rietveld.</p> <p>Understanding Orthographic Drawings, measuring and marking out. Sawing and assembly with accuracy.</p> <p>Key Skills:</p> <p>Measuring, Tolerances, Accuracy Identifying Tools and equipment.</p>	<p>Gerrit Rietveld Red/Blue Chair – Manufactured outcome.</p> <p>Assessing;</p> <p>Measuring and marking with accuracy Cutting and assembly with accuracy.</p>		<p>Theory Lessons</p> <p>PPT Informing Design Decisions Informing Design Decisions worksheet.</p>		<p>To be able to mark out and cut accurately to manufacture a product from an orthographic drawing.</p>
4 weeks	<p>Module Content: Understanding the Design Process.</p> <p>DESIGN AND MAKE CHALLENGE</p> <p>Mobile Phone Stand/Charging station</p> <ul style="list-style-type: none"> • Introduction to CAD/CAM • Introduction to Designing a product for client. • Designing for creativity and Function. • Using the skills across the year to design and manufacture a marketable product. 	<p>Individual teacher comments and feedback throughout.</p> <p>FAR ASSESSMENT 8 – Mobile Phone Stand/Charging station Challenge – Portfolio and Creative Designs</p> <p>Assessing;</p> <p>Designing for a client. Researching key elements for the design of the stand. Product analysis. Creative Designing of the proposed design.</p> <p>Modelling a Prototype.</p>	<ol style="list-style-type: none"> 1. Researching Additive Processes. 2. Scales of Production – Product Case Study 3. Exam Question. 	<p>Introduction to the Mobile Phone stand Challenge! PPT Mobile Phone Challenge Mobile Phone Challenge Booklet</p> <p>Measuring devices – steel rule, Vernier calliper, micrometer.</p> <p>Research: ACCESSFMM Criteria, Support sheets and templates</p> <p>Designing: Support sheets and templates</p> <p>Modelling – card, craft knives, cutting mats, safety rules, scissors, glue stick, camera</p> <p>Theory Lessons</p> <p>CAD/CAM Power point CAD/CAM worksheet Scales of Production.</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>To have an understanding and use of 2D Designer (CAD package).</p> <p>To be able to design and manufacture products to clients' requirements.</p> <p>To be able to use a range of research skills to find out key information to help the students make decisions about their designs.</p> <p>To be able to show drawing and design skills to communicate their ideas to potential clients effectively.</p> <p>To be able to skilfully model and prototype ideas to make final decisions on their final product.</p>
7 weeks	<p>Module Content: Understanding the Design Process.</p> <p>DESIGN AND MAKE CHALLENGE</p> <p>Mobile Phone Stand/Charging station</p> <p>Designing for creativity and Function.</p> <ul style="list-style-type: none"> • Using the skills across the year to design and manufacture a marketable product. <p>Continuation of designing and modelling</p> <p>Manufacture of</p> <p>Theory</p> <ul style="list-style-type: none"> • Introduction to polymers, • Understanding the groups of polymers - identifying names and the differences between them. 	<p>Individual teacher comments and feedback throughout.</p> <p>FAR ASSESSMENT 9 – Mobile Phone Stand/Charging station Challenge – Manufactured outcome</p> <p>Assessing;</p> <p>Manufacturing skills Accuracy Finish Quality</p>	<ol style="list-style-type: none"> 1. – Polymer Processes Home learning Questions 2. – Revise for Test 	<ol style="list-style-type: none"> 1. Introduction to Polymers PPT - Worksheets 2. Experimenting with Polymer Memory PPT Worksheet Jig, Acrylic, Metal rod, Cutters, Pliers, Masking Tape, Belt Sander, File, Scroll saw, Wet and dry, Polish, Pedestal Drill 3. Names and uses of Polymers PPT – Worksheets 4. Investigating Adhesives – PPT – Worksheet Tensol, Epoxy Resin, Contact adhesive, PVA – samples of metal, acrylic and timber 5. Polymer Processes PPT and Worksheets 	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<p>To be able to explain the sources and origins of polymers.</p> <p>To be able to identify the different families of Polymers.</p> <p>Ability to name a range of polymers.</p> <p>Be able to identify and use a range of adhesives.</p> <p>To be able to explain and identify a range of polymer processes.</p>