

Curriculum Overview: YEAR 10: GCSE 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. To prepare students for their NEA by being able to identify and solve problems for a client's needs.

Term / Length of Unit	Outline	Assessment	Home Learning	Resources	Reading	Knowledge/Skills End Points
<p>Autumn Term 1/2 15 weeks</p>	<p>Module Content: Understanding Metals and Processes</p> <p>Introduction to metals,</p> <p>Understanding the groups of metals— identifying names and the differences between them.</p> <p>Metal Processes - understanding a variety of casting processes sand, die and investment.</p> <ul style="list-style-type: none"> Practical Key skills - Pewter Casting Medal <p align="center">FAR ASSESSMENT 1</p> <p>DESIGN & MAKE CHALLENGE</p> <ul style="list-style-type: none"> Trophy Design <p>Using the skills developed since the start of the year - students can explore a mix of materials and processes to design and make a trophy of their choice.</p> <p align="center">FAR ASSESSMENT 2</p> <p align="center">Designing with Ergonomics and Anthropometrics</p> <ul style="list-style-type: none"> Prototype hand-held device Understanding Ergonomics and anthropometrics to design and make a product. <p align="center">FAR ASSESSMENT 3</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR ASSESSMENT 1 – Manufactured Pewter Medal</p> <p>Assessing: Designing, modelling skills, & quality of pewter casting.</p> <p>FAR ASSESSMENT 2 – Manufactured Trophy</p> <p>Assessing: Designing, choice of materials, effective manufacturing skills, & quality of assembly.</p> <p>FAR ASSESSMENT 3 – Anthropometric Model</p> <p>Assessing: Anthropometric Design, modelling skills, & quality and effectiveness of prototype.</p>	<p>1.Sources of metals</p> <p>2.Metals and Alloys</p> <p>3.Commercial Processes of Metals</p>	<p>Resources;</p> <p>1.Introduction to Trophy project PPT – Trophy Project</p> <p>Theory Lessons</p> <ol style="list-style-type: none"> Sources of Metals – PPT, work sheets Working with metals – PPT, worksheets Metals and Alloys – PPT, worksheets Commercial Processes of Metals – PPT, worksheets SMART Materials – PPT – fact sheet Composite Materials – PPT fact sheet Ergonomics and Anthropometrics task <p>Materials & Equipment Model: Card, craft knife, safety rule, cutting mat etc. Medal: Pewter, forge, file, emery cloth etc. Trophy: Acrylic, range of timber, metals, adhesives, workshop tools and equipment. Ergonomics: Styrofoam, plasticine and a range of workshop tools and equipment.</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<ul style="list-style-type: none"> To be able to identify the 3 Families of metals – Ferrous, non-Ferrous and Alloys. To be able to describe the properties of the families of metal. Be able to name metals, their individual properties and where they are used and why? To be able to use the pewter casting process to make a product. To be able to design a product for a client. To be able to design and manufacture a product using a combination of materials. (Mini-project links elements of the NEA – components practised and developed to help students complete and prepare for the NEA). To be able to describe a SMART and composite material and give examples. To explain what Ergonomics and Anthropometrics are and how they can be used to design products
<p>Spring term 1 6 weeks</p>	<p>Module Content: Up-Cycling Revolution</p> <p>Designing and Prototyping the upcycling of a selected product.</p> <p>Reinforcing the understanding of Green issues, sustainability and Green Energy.</p> <p>6 R's of sustainability</p> <p align="center">FAR ASSESSMENT 4</p> <p>DESIGN & MAKE CHALLENGE</p> <ul style="list-style-type: none"> Up-Cycling Revolution <p>Using the skills developed since the start of the year - students can explore a mix of materials and processes to design and make an up-cycled product of the student's choice.</p> <p align="center">FAR ASSESSMENT 5</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR ASSESSMENT 4 –</p> <p>Assessing; Information retrieval, analysis and presentation.</p> <p>FAR ASSESSMENT 5 – Designing</p> <p>Assessing; Range of criteria, justified and detailed.</p>	<ol style="list-style-type: none"> – Research and Investigation of upcycled products – Sustainability - Examination question – Sustainability – The future! 	<p>Resources;</p> <p>Introduction to the Upcycling Project power point ICT facilities</p> <p>Modelling – card, craft knives, cutting mats, safety rules, scissors, glue stick, camera</p> <p>Final modelling – Students choice of materials and tools/equipment.</p> <p>Theory Lessons Designing for manufacturing, maintenance, repair and disposal.</p>	<p>Knowledge Organiser Revision booklet Project power point Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<ul style="list-style-type: none"> To understand the NEA process and requirements. To understand the concept of upcycling Reinforcing an understanding of sustainability, 6R's, recyclable materials Designing for manufacturing, maintenance, repair and disposal.
<p>Spring term 2 & Summer Term 1 12 weeks</p> <p>Researching the Task and investigating the problem.</p>	<p>Mock NEA Design and Make Challenge – Open task – students working within a context – setting their brief and client – Research linked to design brief, specification, designing and prototyping.</p> <p align="center">FAR ASSESSMENT 6</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR ASSESSMENT 6 – Product Analysis</p>	<ol style="list-style-type: none"> Sources of Timbers Preparation and Stock Timbers. Commercial Processes of Timbers 	<p>Resources; Introduction to NEA project PPT – Mock NEA Launch Mock NEA Action Plan</p> <p>Theory Lessons Sources of Timbers – PPT, work sheets</p>	<p>Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks.</p> <p>Power point information Key words</p>	<ul style="list-style-type: none"> To be able to explain the NEA process and requirements. To know about Timbers, naming the 3 families and origins. Able to explain how Timber is Seasoned and what stock forms timber is available in. To be able to name a range of Timber processes and finishes.

	<p>FAR ASSESSMENT 7</p> <p><u>Theory:</u> To understand the NEA process and requirements. To understand Timbers, 3 families and origins. Timber Seasoning and stock forms Timber processing and finishes.</p>	<p>Assessing: Information retrieval, analysis and presentation.</p> <p>FAR ASSESSMENT 7 – Specification</p> <p>Assessing: Range of criteria, justified and detailed.</p> <p>Designing</p> <p>Assessing: Quality of pages and presentation, quality of drawings, creativity, annotated notes.</p>		<p>Working with Timbers – PPT, worksheets Commercial Processes of Timbers – PPT, worksheets</p> <p>Materials & Equipment Model: Card, craft knife, safety rule, cutting mat etc. Medal: Pewter, forge, file, emery cloth etc. Trophy: Acrylic, range of timber, metals, adhesives, workshop tools and equipment. Ergonomics: Styrofoam, plasticine and a range of workshop tools and equipment.</p>		
<p>Summer term 2 6 weeks</p>	<p><u>Final NEA</u> Design and Make Challenge – Open task – students working within a context – setting their brief and client – Research linked to design brief, specification, designing and prototyping.</p> <p>FAR ASSESSMENT 4</p> <p>FAR ASSESSMENT 5</p> <p><u>Theory:</u> To understand the NEA process and requirements. To understand Timbers, 3 families and origins. Timber Seasoning and stock forms Timber processing and finishes.</p>	<p>General teacher feedback throughout each task.</p> <p>Verbal and written feedback.</p> <p>FAR ASSESSMENT 4 – Product Analysis</p> <p>Assessing: Information retrieval, analysis and presentation.</p> <p>FAR ASSESSMENT 5 – Specification</p> <p>Assessing: Range of criteria, justified and detailed.</p> <p>FAR ASSESSMENT 6– Designing</p> <p>Assessing: Quality of pages and presentation, quality of drawings, creativity, annotated notes.</p>	<p>1. Client Profile 2. Research – individual specific to project. 3. Survey/Questionnaire</p>	<p>Resources; Introduction to NEA project PPT – Mock NEA Launch Mock NEA Action Plan</p>	<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 NEA process and requirements.</p>