

Curriculum Overview: A LEVEL PRODUCT DESIGN

Rationale:
(STUDENTS WILL BE FOLLOWING THIS PLAN OVER A 2 WEEK ROTATION AS STATED BELOW THE ROOMING WILL DETERMINE WHICH TYPE OF LESSON WILL BE TAKING PLACE AND AT WHAT TIME DURING EACH 2 WEEK ROTATION)

Students will acquire an understanding of the properties and characteristics of a range of materials including Timbers, Metals and Polymers, through the use of a range of Hand and Machine Based Manufacturing Processes and Techniques (e.g. Material Removal, Material Forming, Joining, Heat Treatment and Finishing). Further knowledge of CAD software and Orthographic Drawing techniques will be incorporated throughout the course. Students are encouraged to be creative incorporating a wide range of different materials, finishes and processes in the design and manufacture of their products.

Also a good theoretical knowledge of the properties, processes, production and finishes of a range of different materials. Students will explore the wider world of product design learning about the influences, stimuli and constraints of design and manufacture. Consideration of commercial and industrial processes to manufacture products in scale and are encouraged to look at products in a different light, pushing boundaries and considering designing for All.

Term / Length of Unit	Outline	Assessment	Home Learning	Resources	Reading	Knowledge/Skills End Points
Half Term 1 7 weeks	<p><u>Design Challenge</u></p> <p>This unit focusses on students' skills, refreshing skills and developing new skills to bring students to that same standard. This will be offered through a selection of mini projects, masterclasses and culminating in a lengthier design and manufacture project.</p> <p>1.Design Challenge Students focus upon their drawing/designing skills. Students challenged to draw in line, colour and orthographic. Providing opportunities for intervention and support where required. Students are challenged to design and prototype a scent bottle. Focused design pages and techniques leading to a 3D Styrofoam model of the bottle.</p> <p>Running Parallel with the Perfume bottle challenge, students will explore the design and manufacture using resistant materials including timber, metal and polymers.</p>	<p>FAR 1. - Assessment of the design of the Perfume bottle designs and prototype.</p>	<p>Students will be provided with a selection of tasks to maximise their free study periods within school and a selection of tasks that will require completing at home.</p>	<p>Full SOL with lesson resources generated through power points.</p> <p>PowerPoints and work sheets on Staff Resources.</p> <p>Revision book</p> <p>Design Challenge Power point Selection of worksheets. Graphic media, such as coloured pencils etc. Materials; Styrofoam</p> <p>Tools/Equipment; A range of hand tools and finishing paper.</p>	<ul style="list-style-type: none"> • Key vocabulary used • Core definitions of key words • Use of knowledge organisers 	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • Understanding and interpretation of orthographic drawings. • Key Designers – Alessi, Bauhaus and Gerritt Rietveld • <i>Informing Design Decisions</i> • <i>People, Culture and Society</i> • <i>Sustainability and the Environment</i> • <i>Design and Marketing Influences</i> • Refresh of ACCESSFM and Product Analysis. • Accurately measuring and marking out of materials. • Understanding of the use and function of a range of hand tools and machinery. • Knowing how to use a range of tools appropriately, safely and accurately. <p><u>Skills;</u></p> <ul style="list-style-type: none"> • Drawing in 3D, line and rendered • Refresher of orthographic drawing • Marking out accurately. • Cutting materials accurately and safely using a range of tools. • CREATIVITY • Refining and developing fine presentation skills – reinforcing care, detail and finesse. • Challenging the use of a page – filling the page with drawings

	2. All Boxed up Design Challenge Students focus on the design and manufacture of a novelty and unique trinket box.	FAR 2. - Assessment of the design pages, investigative and exploratory processes of surface decoration and construction techniques, and manufacturing of their final product.	Students will be provided with a selection of tasks to maximise their free study periods within school and a selection of tasks that will require completing at home.	Challenge Power point Support booklet Project page guidance. Tools/Equipment; A range of hand and power tools. Materials: A range of timbers, metals and polymers to address the needs of the creative designs.	<ul style="list-style-type: none"> • Key vocabulary used • Core definitions of key words • Use of knowledge organisers • Additional extended reading – Revision guides. 	<u>Knowledge</u> <ul style="list-style-type: none"> • Understanding of materials and Properties (Timber, Metal and Polymers) • Source to material • Processes, Assembly methods and finishing. • Key Designers • <i>Market Pull v Technology Push</i> • Accurately measuring and marking out of materials. • Understanding of the use and function of a range of hand tools and machinery. • Knowing how to use a range of tools appropriately, safely and accurately. <u>Skills:</u> <ul style="list-style-type: none"> • Drawing in 3D, line and rendered • Refresher of orthographic drawing • Marking out accurately. • Cutting materials accurately and safely using a range of tools. • CREATIVITY • Refining and developing fine presentation skills – reinforcing care, detail and finesse. • Challenging the use of a page – filling the page with drawings and detailed annotation.
Half Term 2 7 weeks	4. Light Fantastic Project <u>Design and Make Challenge</u> Students design and manufacture a USB light on their chosen theme.	HL tasks, Exam style questions K/U Practical skills	Properties of materials exam style questions. Research into SMART materials.	POWERPOINTS Worksheets Theory book Knowledge Organiser A variety of materials, tools and equipment.	Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks. Power point information Key words	<i>Knowledge;</i> <ul style="list-style-type: none"> • Selecting the correct materials. • Properties of Engineering Materials – Malleability, Ductility, Machinability, Conductivity, Brittleness, Elasticity, Plasticity, Hardness, Toughness, Tensile Strength, Corrosive. • Review of Timbers and their uses – more detailed. <ul style="list-style-type: none"> ◦ Sources, Production, Seasoning ◦ Families and Properties ◦ Finishes ◦ Processes and Forming • Review of Polymers and their uses – more detailed. • Introduction to Polymers – Properties and characteristics. <ul style="list-style-type: none"> ◦ Sources, Production, Seasoning ◦ Families and Properties ◦ Finishes ◦ Processes and Forming ◦ Biodegradable polymers • SMART Materials Practical – Lighting Product <ul style="list-style-type: none"> • Range of different materials, tools, equipment and processes to match the individual needs of each student and their project.
Half Term 3 6 weeks						<i>Knowledge;</i> Practical – Lighting Product <ul style="list-style-type: none"> • Range of different materials, tools, equipment and processes to match the individual needs of each student and their project.
Half Term 4 6 weeks	<u>Launch of NEA</u> Theory lessons Investigate possible contexts that are suitable for the NEA. AO1 – Identifying and investigating design possibilities. Mind map Client profile Initial concept ideas Research NEA theme Product Analysis	HL tasks, Exam style questions K/U NEA Research	Identification of a typical Research of NEA to examination spec and criteria.		Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks. Power point information Key words	<i>Theory;</i> <ul style="list-style-type: none"> • Review of Metals and their uses – more detailed. • Materials Testing – Hardness, Strength, Impact, Fatigue and Creep testing. • Mechanical Testing – Brinell, Izod, Charpy and x-ray testing. • Practical: Experiment, students explore and test a range of different materials. • Material Removal – understanding and identification of a range of tools and equipment and machines

	Materials and components NEA specific research					
Half Term 5 5 weeks	<u>Continuation of NEA</u> Theory lessons AO1 Section B – Producing a Design Brief and Specification. AO2 Section C – Development of Design proposals.	HL tasks, Exam style questions K/U Practical skills	Standard Component Investigation Task. Report on spot welding in the car industry.	POWERPOINTS Worksheets Theory book Knowledge Organiser A variety of materials, tools and equipment.	Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks. Power point information Key words	<i>Theory;</i> <ul style="list-style-type: none"> Metals Processes – Forming, Casting, Forging, Wasting. Methods of joining Metals – Soldering, Welding, Brazing, Riveting, Adhesives, Threading. Practical Testing – Students join a selection of metals using the processes on a skills board. Practical – Modelling and prototyping with a selection of different materials such as Styrofoam, card, MDF etc...
Half Term 6 7 weeks	Ongoing - Identifying and investigating design possibilities. Range of design ideas and proposals – investigating a wide range of proposals. Mini – modelling and experimentation of proposed ideas.	Feedback on the NEA. HL tasks, Exam style questions K/U Practical skills	Research into One-off, batch and mass production and the implications of each.	POWERPOINTS Worksheets Theory book Knowledge Organiser A variety of materials, tools and equipment.	Knowledge Organiser Revision booklet Sequence of practical tasks Research and write tasks. Support Guide Power point information Key words	<i>Theory;</i> <ul style="list-style-type: none"> Understanding Quality Control Understanding the implications of H&S for the employer and employee PPE and safety precautions including COSHH