

Key Stage 4 Overview: Product Design Year 10

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Year 10 Product Design	<p>University Challenge:</p> <p>Context: New & Emerging Technologies</p> <p>Skills:</p> <ul style="list-style-type: none"> Identifying advantages/disadvantages of robots within manufacturing processes. Investigating smart technology within the manufacturing process and communication system. Use of CAD/CAM for automation of systems and processes within the manufacturing stage. Industry & Enterprise – Researching market of design project Market pull and technology push Crowd funding of products in development, virtual marketing and retail Tailoring design of products to a specific user group Concept generation of products through freehand sketching 	<p>University Challenge:</p> <p>Context: Energy, Materials, & Systems</p> <p>Skills:</p> <ul style="list-style-type: none"> Discussing arguments for and against nuclear power and effect on local communities Highlight difference between renewable and non-renewable fuels Moja island activity – selecting from a range of most appropriate technology for communities’ needs. Investigating and comparing different energy storage. Development of modern and smart materials. Examples of materials or products made from modern, 	<p>University Challenge:</p> <p>Context: Mechanical Devices, Materials & Their Working Properties</p> <p>Skills:</p> <ul style="list-style-type: none"> Investigating case studies of a range of mechanisms and their uses. Demonstrate the 4 main types of motion and investigate the use within everyday products. Changing and converting types of motion into another type of movement. Identifying specific mechanisms such as levers, linkages and rotary systems. Designing a prototype of one of the types of mechanisms and motions modelling on an existing product. Produce accurate diagrams and 	<p>University Challenge:</p> <p>Context: Design Challenge & Materials & Their Properties</p> <p>Skills:</p> <ul style="list-style-type: none"> Independent research into a designer or company of appropriate product. Provide themes of design style and philosophy or product and how they support the client’s profile. Matching design need to consumer profile, analysing data from market research and how this will be used to inform design. Consumer/user research, collating research findings from questionnaires into presentable data. Product analysis of existing products, use 	<p>University Challenge:</p> <p>Context: Designing & Making - Modelling Prototypes</p> <p>Skills:</p> <ul style="list-style-type: none"> Transferring design sketches to 2D technical drawings, front/side/top views. Modelling of product design using measuring and marking techniques and processes. Modelling of product design using material reduction and removal techniques and processes. Modelling of product design using material refinement/finishing techniques and processes. Modelling of product design using assembling and joining techniques and processes. Final design communication through detailed 3D 	<p>University Challenge:</p> <p>Context: Exam Revision & NEA Intro, Design Context/Challenges</p> <p>Skills:</p> <ul style="list-style-type: none"> Producing revision cards for new and emerging technologies, material properties, energy sources and mechanism and forces. Exploring context of creative challenge for NEA using mindmap techniques. Identifying needs using market and client research/interviews. Finalising choice of contextualised challenges. Primary research of chosen contextualised challenges. Focused research based on analysis of

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	<ul style="list-style-type: none"> • Annotating existing products with suggestions of design for maintenance, planned obsolescence and reducing impact on environment • Applying six Rs of sustainability to a range of products 	<p>smart and composite materials, identify and briefly analyse considering properties and reason for use.</p> <ul style="list-style-type: none"> • Annotating system diagrams and designing a 'systems' solution for a provided scenario. • Identifying input, processes and outputs of systems. 	<p>designs which illustrate motion, including calculations and measurements, degrees of freedom, etc.</p> <ul style="list-style-type: none"> • Investigating a range of materials and their key properties. • Categorising the different materials according to their physical and working properties and appearance amongst papers and boards. 	<p>of ACCESSFMM method.</p> <ul style="list-style-type: none"> • Generating a range of sketches and concepts based on the existing design challenge. • Continuation of categorising materials according to properties amongst metals and alloys, polymers, natural & manufactured timbers and textiles. • Using knowledge of material properties to select appropriate materials for design project. 	<p>isometric and perspective drawings.</p> <ul style="list-style-type: none"> • Producing a detailed manufacturing specification outlining the quality control and processes for making the final product. 	<p>contextualised challenge.</p> <ul style="list-style-type: none"> • Product analysis with focus on function, shape/form and information provided on packaging, corporate identity, etc. • Analysis of packages and products based on research. • Producing a consumer profile following discussion of product analysis/design and market influences.
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