

Product Design - Key Stage 3 Topics

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	<p>Mechanisms</p> <p>Students will develop an understanding of a range of mechanisms, how they function and are used. They will develop practical skills in the use of tools for shaping wood and experience methods of joining woods. Individuals will design and make a product having moving parts.</p> <p>Graphics</p> <p>Students develop graphic representation and engineering drawing skills, to include skills with drawing equipment and their accurate use and introduce students to the basic principles and functions of CAD.</p> <p>Textiles</p> <p>Students develop an understanding of the health and safety requirements in college workshops. They are introduced to and develop skills in basic pattern cutting, hand stitching and machine stitching. Students investigate fabric properties and mechanisms in systems and control.</p>					
Year 8	<p>Control</p> <p>Students are introduced to the elements of a system, classification and flowchart symbols. Also an introduction to the CAD program Pro Desktop and its basic functions are covered through a camera design project. Students study pneumatics and its applications pneumatic components, circuits and use of a simulator, pneumatic system block diagram.</p> <p>Plastics</p> <p>Students are introduced to plastics and the industrial processes used with them. Reference is also made to recycling and global resources. They then produce a simple game with plastics, and build on basic electrical theory experienced in Science to produce a simple electrical circuit.</p> <p>CAD/CAM</p> <p>Students are introduced to skills in the use of CAD systems using the program 2D Designer. They gain an understanding of CAM using the Laser Cutter. Students explore packaging and refine strategies for producing blister packs. Finally students develop practical skills in pewter casting.</p>					
Year 9	<p>Engineering</p> <p>Students will undertake the whole of an engineering design process and experience the problems engineers need to overcome. They will design the answer to a given problem, produce using both CAD and traditional methods the drawings required. Students will develop and modify their ideas, produce production plans to a high level and an outcome from a drawing provided thus demonstrating craft ability and an ability to read drawings. Students will test and evaluate the outcomes and suggest design improvements.</p> <p>Product Design</p> <p>Students undertake three projects based on the main focus areas of the course at GCSE level. These projects give students the experience of CAD/CAM, designing with innovation and flair, graphic communication, real world design situations and collaborative work.</p>					

Product Design - Key Stage 4 Topics

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 10	Students build a skills base for use in module A551 and A552. Students will demonstrate elements of creativity in their work and use graphic techniques to communicate.	Students recall, select and communicate their knowledge and understanding of design and technology including its wider effects.	Students apply knowledge, understanding and skills in a variety of contexts and in designing and making products.	Students analyse and evaluate products, including their design and production.	Students build a skills base for use in module A553.	Students develop a range of skills and techniques appropriate to the task, including those necessary to ensure realism of a prototype product.
Year 11	Students apply knowledge, understanding and skills in a variety of contexts and in designing and making products.		Students analyse and evaluate products, including their design and production.		<p>In preparation for the examination, students will record details of iconic products, trend setters and eras/movements.</p> <p>Students will revise for questions in both sections based on knowledge and application. Students will prepare to demonstrate their understanding through the use of single words, short sentences, annotated sketches and diagrams.</p>	

Product Design - Key Stage 5 Topics

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 12	Product analysis, polymers – types, uses, properties and processes	Metals – types, uses, properties and processes. Composites and smart materials	Modern materials, woods – types, uses, properties and processes	Sustainability issues, quality control, use of jigs, Safety in products and design	CAD, CAM, CNC. Coursework support	Developments in Technology, Product Life Cycle
Year 13	A study of manufactured products and systems. Product development and improvement	The influence of Design and Technology in society. 2 and 3D communication methods and enhancements	ICT applications, Manufacturing systems, systems and control, safety. Role of the designer, The marketing function	Design methods, Design in the human context, Copyright and other forms of protection, The work of past and present designers	Revision and review.	