

Our Lady Queen of Peace

Catholic Engineering College

Curriculum Overview

YEAR 10 GCSE Design & Technology

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	Components (Key Concepts)	Recall & Retrieval Practice Focus	Read Like A... Focus	Key Vocabulary	
Half Term 1	Introduction to Product Design and Manufacture – Skills building for manufacturing processes and interpretation of technical information.	<p>Fixings: Mechanical fixings: screw threads, brazing, riveting & soldering. Exploration of permanent & temporary fixing types Marking Out Engineer's blue, scribing, centre punch, use of a range of callipers.</p> <p>Shaping: Including turning, milling, file work. Work with a range of materials including stock metals, sheet material and plastics.</p> <p>Technical drawing students will create drawings that will aid them in communicating design ideas.</p>	<p>Types of Fixings Marking out tools / equipment and use</p> <p>Use of Tools Shaping materials</p> <p>Engineering drawing types and reading</p> <p>Sequencing of practical's</p> <p>Properties of materials</p> <p>Risk / Health and Safety</p>	"Mechanical Engineer"	<ul style="list-style-type: none"> • Orthographic • Isometric • CAD • Sequencing • Scribing • Punching • Callipers • Mechanical • Riveting • Soldering • Turning • Milling • British Standards • Scale • Measurement • Millimetres • Assembly • Projection • Extrusion 	<p>CAD/CAM Club</p> <p>Buggy/Go kart Club</p> <p>F1 in Schools</p> <p>Industry Visit</p> <p>Link to engineering sectors and local community</p>

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	Components (Key Concepts)	Recall & Retrieval Practice Focus	Read Like A... Focus	Key Vocabulary	
Half Term 2	Material properties	Students to understand the physical and working properties of materials.	Building on exam technique and previous KS3 understanding of different materials.	“How was that built?”	<ul style="list-style-type: none"> • absorbency • density • fusibility • electrical and thermal conductivity. • strength • hardness • toughness • malleability • ductility and elasticity. • Liquid Crystal Displays • Nanomaterials. • Graphene, • shape memory alloys, • thermochromic pigments • photochromic pigments • carbon fibre reinforced plastic • conductive • Kevlar 	CAD/CAM Club Buggy/Go kart Club
	Physical Properties					
	Working Properties					
	Developments in new materials					
	Modern materials	Students to understand the developments made through the invention of new or improved materials.	Exam style questions on:			
	Smart materials	Understand that materials can have one or more properties that can be significantly changed in a controlled fashion by external stimuli.	Physical Properties			
			Working Properties			
			Modern and Smart Materials.			
	Composite materials	Students to understand that composite materials are produced by combining two or more different materials to create an enhanced material, and how fibres can be spun to make enhanced fabrics.	Composites and technical textiles.			
	Technical textiles					

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	Components (Key Concepts)	Recall & Retrieval Practice Focus	Read Like A... Focus	Key Vocabulary	
Half Term 3	Materials and their working properties	Students to understand the main categories and types of metals:	Building previous KS3 understanding of different types materials including wood, metals and plastics.	“Roots and Wings”	<ul style="list-style-type: none"> low carbon steel cast Iron copper brass stainless steel acrylic (PMMA) high impact polystyrene (HIPS) polyvinyl chloride (PVC) urea-formaldehyde (UF). ash beech mahogany pine MDF plywood 	CAD/CAM Club Buggy/Go kart Club Building links with colleges
	Material categories	ferrous metals, non-ferrous metals and alloys.				
	Metals and alloys					
	Polymers	Students to understand the main categories and types of polymers:	Exam style questions on:			
	Natural and manufactured timbers	thermoforming and thermosetting.	New Materials			
		Students to understand the main categories and types of natural (softwood and hard wood) and manufactured timbers.	Metals and alloys			
	Design strategies		Polymers			
	CAD/CAM uses/positives/negatives	Students to begin a mini-NEA style project in which the outcome will be Timber/polymer/electronics based.	Natural and manufactured timbers			
	Scale of Production		Recall practice on CAD/CAM, Tolerances, QC also covered at KS3.			
	Quality Control / Quality Assurance	-Research into existing products (phone amplifiers)				
	Tolerances	-Design Brief / Specification -Design Ideas and development				

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	Components (Key Concepts)	Recall & Retrieval Practice Focus	Read Like A... Focus	Key Vocabulary	
Half Term 4	Electronic Components Stock forms, types, sizes Tools, equipment, techniques and finishes Finishing Techniques	<p>Students to continue mini-NEA style project, more focus on the manufacturing elements</p> <p>-CAD designs</p> <p>-Orthographic drawings</p> <p>-Manufacture of Phone Amplifier (soldering)</p> <p>-Manufacture of frame</p> <p>-Evaluation of project</p>	<p>Building previous KS3 understanding of different Electronic components, tools and equipment and finishing techniques.</p> <p>Exam questions covering: Material Properties Development of new Materials Material categories</p>	<p>“50 Fashion Legends”</p>	<ul style="list-style-type: none"> • Sensors • Switches • Micro controller • Buzzer • Speaker • Lamps • Stock • Quantity • Length • CAD • CAM • Laser Cutter • Soldering • Fabricate • Orthographic 	<p>CAD/CAM Club</p> <p>Buggy/Go kart Club</p> <p>Building links with colleges</p>
Half Term 5	Paper and Board Design brief / manufacturing specification. Communicating design ideas. Corporate identity and Enterprise Work of other designers	<p>Students complete a mini-NEA style project in which the outcome will be paper/board-based.</p> <p>-Research task – perfume/aftershave packaging</p> <p>-Design brief</p> <p>-Design Task (packaging designs)</p> <p>-Nets theory</p> <p>--Manufacture of Packaging</p>	<p>Building previous KS3 understanding of the design process and communicating design ideas.</p> <p>Exam questions related to Half Term 2-4.</p> <p>Papers and Boards</p> <p>Work of other designers</p>	<p>“There is no Planet B”</p>	<ul style="list-style-type: none"> • Prototype • Sketching • Modelling • Testing • Function • Cost • Availability • Research • Ergonomics • Anthropometrics • Packaging 	<p>CAD/CAM Club</p> <p>Buggy/Go kart Club</p> <p>Building links with colleges</p>

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	Components (Key Concepts)	Recall & Retrieval Practice Focus	Read Like A... Focus	Key Vocabulary	
Half Term 6	NEA Introduction / Outline (Specification / Mark scheme)	<p>NEA section A – Identifying and investigating design possibilities</p> <p>Students to begin initial Research and complete portfolio:</p> <ul style="list-style-type: none"> -Exploring the contextual challenge -Client Profile -Existing Products -Product Analysis -Relevant Designers -Materials Research <p>Design Brief and Specification</p>	<p>Building on previous knowledge of the Design Process</p> <p>Client Expectations</p> <p>Analysing Information</p> <p>Exam Questions based on content learnt from HT 2-5.</p>	"From A to Eames"	<ul style="list-style-type: none"> • Analyse • Client • Aesthetics • Cost • Customer • Environment • Size • Safety • Function • Material • Location • Brief • Specification 	<p>CAD/CAM Club</p> <p>Buggy/Go kart Club</p> <p>Building links with colleges</p>

Key Assessments

When	What will be assessed?	Why is this being assessed?	How will results be stored & students receive feedback?
December	Theory information: New Materials	Assess Understanding of the content taught for Unit 1 (Exam) so far	Written feedback given to students, and recorded on tracker.
March	Theory information based upon: Material Properties New Materials Material Categories CAD/CAM Scales of Production	Assess Understanding of the content taught for Unit 1 (Exam) so far, written mock exam assessment.	Recorded on tracker and SIMS, students will receive marked papers back with areas for improvement.
May	Theory Paper based around content taught during terms 2-5. Practical assessment (Mini NEA)	Assess Understanding of the content taught for Unit 1 so far, written mock exam assessment. To Show understanding or the task in practice for the full NEA (Unit 2).	Recorded on tracker, students will receive marked papers back with areas for improvement. Recorded on tracker with written feedback for students.
July	Section A of Full NEA	This is students official NEW which will be sent off to the exam board.	Students will be given some guidance on the work completed. Marks recorded on tracker.