

DT Product Design/Engineering

Key Concepts Mapping – Design Technology/Engineering

Sustainability, research and investigation, design brief and specifications, new technologies, materials and properties, mechanical and electronic systems, methods of production, generating design ideas, rendering, CAD/CAM, design techniques, plan of manufacture, product analysis and disassembly, models and prototypes, making skills, testing and evaluation.

KS3 and KS4 Product Design				
Year 7	Year 8	Year 9	Year 10	Year 11
Sustainability in design - 6 R's, Plastics and biodegradable plastics Responsible design	Mechanisms and motions Mechanical systems and devices	Metals	New and emerging technologies	NEA investigation - primary and secondary research, product analysis
New technologies	New technologies	Electronics	Sustainability in design - energy generation and storage, renewable and non-renewable resources	Social, economic and sustainability influences on design

Design specifications Design - generating design ideas	Designing principles - introduction to isometric drawings, freehand sketching and annotating Design specifications User centred design Culture in design	CAD/CAM	Energy, materials, systems and devices	Design brief and specifications.
Making skills – bug hotel	Timber based materials - sources of timber and life cycle Smart materials	Design inspiration Design – Engineering drawings Design specifications Client profiles and user centred design	Designing principles - isometric and exploded drawings and rendering	Designing principles - iterative design, isometric, perspective, orthographic, annotating, rendering, exploded drawings and making a prototype
Evaluation	Making - mechanical children's toy	Making - Lamp	Making principles - making a prototype CAD/CAM	Plan of manufacture
	Evaluating - testing and suggesting improvements	Evaluating	Materials and their working properties - Timber based materials	Making principles - material properties and joining materials
	Health and safety in the DT workshop		Methods of production	Evaluating and testing - client testing and feedback, target market feedback, tolerances, strengths, weaknesses and improvements.

			Common specialist technical principles	Materials and their working properties - Timber based materials
			Research and investigation, primary and secondary research	

KS4 Engineering

Year 7	Year 8	Year 9	Year 10	Year 11
			Freehand sketches Annotating design ideas Orthographic drawings Isometric drawings Assembly drawings Sectional drawings	Design strategies - iterative design, user centred design
			Use of light to create tone - rendering	Research and investigation and product analysis
			Health and safety in the workshop	Design brief and specifications
			Making principles - making a prototype and creating a design solution	Making models and prototypes
			CAD/CAM and virtual CAD modelling	Methods of production

			Product analysis Product disassembly	Sustainability in design
			Plan of manufacture	Designing methods - oblique, isometric, orthographic
			Modelling physical prototypes	Rendering
			Evaluating against design specification, evaluating ideas, recording results, and suggesting improvements. Quality control checks.	CAD modelling
			Research and investigation	Evaluating design ideas and quality control checks
			Sustainability in design	Health and safety in the workshop