Year	Autumn	Spring	Summer
7	• Construction lines – planning a drawing. • Grid method – scaling/copying a drawing. • 3D drawing using the oblique method. • Rendering – colour, texture, tone/shading • Manufacturing skills – workshop health and safety and hand tools.	• CAD/CAM – laser cutter focus • Timbers • Papers and Boards • Manufacturing skills – workshop health and safety and hand tools. • CAD/CAM skills – 2d Design (CAD), laser cut keyring.	• Packaging • Product Analysis • Design Specification • CAD/CAM skills – 2d Design (CAD), laser cut keyring. • Design and make project – Rag Doll sewing skills project
8	• Isometric Sketching and crating • Rendering – colour, texture, tone/shading, thick and thin lines. • Structures – bridge challenge group project	• CAD/CAM - 3d printer focus • Timbers • Papers and boards • Polymers • Structures – bridge challenge bridge challenge group project with electronics/coding.	• Health & Safety • Tools & Machinery • Smart Materials • Motion, forces, mechanisms – mechanical toy design and make project

		• Motion, forces, mechanisms – mechanical toy design and make project.	
9	Chair project- • Design brief • Research & exploration – anthropometrics and ergonomics • Manufacturing equipment • Initial design ideas – sketching, dimensioning, labelling/annotations using ACCESSFM. • Design development • Final design • Engineering/orthographic drawings.	Chair project- • Prototyping • Evaluating Phone holder project- • 3D CAD skills building	Phone holder project- • 3D CAD skills building – 3D printer. • 2D CAD skills building – laser cutter. • Production plan and risk assessment • Manufacturing • Testing & feedback.
10	Engineering Design- • The design cycle and process • Design strategies • Research methods • Communicating ideas: • Freehand sketching and rendering skills. • Isometric drawing • Labelling • Annotating	Engineering Design- • Engineering drawing – methods, 1st and 3rd angle, dimensioning, labelling, symbols, abbreviations, line style. • 3D CAD skills – creating parts, assemblies and rendering. • CAD/CAM manufacturing project - creating 3D printer and laser cutter files from CAD work.	Engineering Design- • Evaluating design ideas • Modelling methods • User testing and feedback • Ranking matrixes • QFD evaluations Live NEA • 1st of June

	• Dimensioning using engineering standards. • Methods of evaluating a product • Design brief • Design specification factors • Manufacturing processes and materials • Legislation and standards • 2D CAD skills – orthographic drawing and laser cutter	• Production plans • Risk assessments • Manufacturing skills and considerations: • Tolerances • Design for manufacturing assembly • Design for disassembly • Health and safety	• R039 and R040 • Unit R039: Communicating designs. • Freehand sketching and rendering • Labelling and annotating • Orthographic drawing and parts list • Exploded drawing. • Rendered 3D CAD model.
11	Engineering Design- • Ongoing revision – R038 units 1 to 4 • Live NEA • Unit R039: Communicating designs • Freehand sketching and rendering • Labelling and annotating • Orthographic drawing and parts list • Exploded drawing • Rendered 3D CAD model • Unit R040: Design, evaluation and modelling • Existing product analysis and report	Engineering Design- • Ongoing revision – R038 units 1 to 4 • Live NEA • Unit R040: Design, evaluation and modelling • Existing product analysis and report • Product disassembly and analysis report • 3D CAD assembly • Production planning • Manufacturing • Evaluation	Ongoing revision – R038 units 1 to 4

	• Product disassembly and analysis report • 3D CAD assembly • Production planning • Manufacturing • Evaluation		

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