



Curriculum Map: Design & Technology

Content is sequenced in phases at KS3. Students will have two lessons over a two-week timetable and will rotate between teachers. Students will cover the specialisms of resistant materials, electronics and graphics.

Design Skills (identifying problems/exploring context and communicating ideas). Making Skills (manufacturing, practical skills and good workshop) practice.
Knowledge and understanding (materials, processes and manufacturing).

	Autumn 1 - Autumn 2 - Spring 1	Spring 2 - Summer 1 - Summer 2
Year 7	Resistant Materials 1 Phase 1 Clacker Toy Project: <ul style="list-style-type: none"> . Workshop safety. . Consider context. . Ideas and features. . Construction methods. . Introduction to woods: Categories, working properties and characteristics. . Wood finishing and decoration processes. . Workshop safety. . Manufacturing methods and key terminology. . Scroll/coping and tenon saw, linisher and abrasives, pillar drill. . Manufacturing clacker toy, practical skills and material manipulation development and decoration. . Peer testing and evaluation. 	Electronics 1 Phase 1 Jitter Project: <ul style="list-style-type: none"> . Workshop safety. . Consider context, specification points and jitter toy ideas. . Features, communicating ideas and analysis. . Plastic properties and characteristics. . Manufacturing methods and key terminology. . Vacuum forming and gerbil cutter process. . Introduction to machinery and H&S. . Vacuum forming and gerbil cutter task. . Use of hand tools for shaping of HIPS base. . Use of pillar drill and linisher. . Injection moulding process, method and application. . Injection moulding task - Moulding feet for jitter toy.

		<ul style="list-style-type: none"> . Introduction to soldering equipment, electronic components, circuits and H&S. . Soldering task - Assembling circuit and motor. . Jitter toy shell decoration.
Year 8	<p>Graphics 1</p> <p>Phase 1</p> <p>Modelling Project:</p> <ul style="list-style-type: none"> . Workshop safety. . Brand image and development. . Uses and application of modelling and prototyping. . Ideas generation <ul style="list-style-type: none"> - Developing interest and the 'wow' factor. . Creativity, aesthetics and analysis. . Card and modelling skills. . Workshop safety. . Materials and fixatives for modelling. . Introduction to tools, equipment and H&S. . Shop front model manufacture. . Branding and promotional material. . CAD graphics development. . Promotional material manufacture. 	<p>Resistant Materials 2</p> <p>Phase 2</p> <p>Storage Project:</p> <ul style="list-style-type: none"> . Workshop safety. . Exploring context and identifying target audience. . Construction methods. . Ideas generation and analysis. . Developing 3D drawing skills. . Introduction to woods: Categories, working properties and characteristics. . Wood finishing and decoration processes. . Workshop safety. . Manufacturing methods and key terminology. . Scroll saw, linisher and pillar drill. . Manufacturing storage container, practical skills and material manipulation development and decoration. . Peer testing and evaluation.
Year 9	<p>Resistant Materials 3</p> <p>Phase 3</p> <p>Tea Light:</p> <ul style="list-style-type: none"> . Workshop safety. . Exploring context and analysis of Memphis design movement. . Ideas generation. . Planning for making. . Sequencing component manufacture. 	<p>Resistant Materials 4 (including electronics – P2 and compliant materials – P2)</p> <p>Phase 2-4</p> <p>Clock:</p> <ul style="list-style-type: none"> . Workshop safety. . Consider context, specification points and jitter toy ideas. . Features, communicating ideas and analysis. . Wood, plastic, metal and manufactured boards properties and characteristics. . Manufacturing methods and key terminology.

	<ul style="list-style-type: none"> . Introduction to metals. . Categories, working properties and characteristics of metals. . Workshop safety. . Manufacturing processes, construction methods and key terminology. . Introduction to machinery and H&S. . Metal shaping. . Cold forming aluminium tea-light bowl and mild steel stand. . Riveting. . Testing and evaluation. 	<ul style="list-style-type: none"> . Wood finishing and decoration processes. . Introduction to tools, machinery and H&S. . Use of hand tools for shaping of HIPS base. . Use of scroll saw, pillar drill, linisher and strip heater. . Riveting. . Introduction to soldering equipment, electronic components, circuits and H&S. . Adhesives, fixatives and mechanical fixing methods. . Testing and evaluation.
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Extension design and make mini projects. These will revisit materials and manufacturing processes.

Night Light

- . Introduction to soldering equipment, electronic components,
- . Ideas generation
- . Mould making and vacuum forming.
- . Hand tool and machine skills.
- . Shaping and working wood.
- . Shell manufacture.
- . Soldering and assembly.

Egg Race Challenge:

- . Ideas generation.
- . Collaborative working and problem solving.
- . Hand tool and machine skills.
- . Shaping and working wood.
- . Decoration, assembly and challenge.

Mechanical Toy:

- . Mechanical systems.
- . Function and component identification.
- . Understanding cams and movement.
- . Ideas generation
- . Shaping and working wood.
- . Hand tool and machine skills.
- . Planning for manufacture.
- . Automata manufacture.

Torch and Packaging:

- . Looking at multi material and component products.
- . Consideration of product marketing.
- . Mould making and vacuum forming.
- . Blister package manufacture.
- . Packaging graphics and CAD.

Plane Challenge:

- . Aerodynamics.
- . Ideas generation.
- . Collaborative working and problem solving.
- . Hand tool and machine skills.
- . Shaping and working wood.
- . Decoration, assembly and challenge.

Key Stages 4 and 5

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10 Product Design	<ul style="list-style-type: none"> . Drawing and designing skills. . Looking at key points of product analysis. <p>Design and make task:</p> <ul style="list-style-type: none"> . Concept modelling and use of vinyl cutter. 	<ul style="list-style-type: none"> . Drawing and designing skills. . Looking at key points of product analysis. . Looking at design eras. . Study of Alessi and product analysis of work. <p>Design and make task:</p> <ul style="list-style-type: none"> . Plastics/polymers. . Jigs, templates, formers. . Card modelling. . Photo types. . Line bending, surface texture and CNC milling. <p>. Theory and homework tasks.</p>	<ul style="list-style-type: none"> . Drawing and designing skills. . Paper and sizes. . Looking at key points of product analysis. . Looking at design eras. . Study of Dyson and product analysis of work. <p>Design and make task:</p> <ul style="list-style-type: none"> . Electronics lighting. . Wood and metal machinery and skills. <p>. Theory and homework tasks.</p>	<ul style="list-style-type: none"> . Drawing and designing skills. . Looking at key points of product analysis. <p>Design and make task:</p> <ul style="list-style-type: none"> . Scale modelling and prototyping of furniture. . Knock down fittings and flat pack furniture. . Traditional wood joints. <p>. Theory and homework tasks.</p>	<p>Non Exam Assessment (50%):</p> <ul style="list-style-type: none"> . Introduce NEA and contexts. . Product analysing skills. . Problem solving skills. <p>. Theory and homework tasks.</p>	<p>Non Exam Assessment:</p> <ul style="list-style-type: none"> . Start NEA. . Analysis of task. . Client and user needs. . Plan of NEA. . Context research. . General research.

Year 11 Product Design	<p>Non Exam Assessment:</p> <ul style="list-style-type: none"> . Investigation of social, moral and environmental issues. . Investigation of ergonomics, anthropometrics and safety standards. . Analyse research. . Create specification. 	<p>Non Exam Assessment:</p> <ul style="list-style-type: none"> . Development of ideas. . Review and evaluate, Client input. . Modelling. . Final concept. . Completion of working drawings, including CAD. 	<p>Non Exam Assessment:</p> <ul style="list-style-type: none"> . Production plan and diary of making. . Manufacture of NEA concept. 	<p>Non Exam Assessment:</p> <ul style="list-style-type: none"> . Manufacture of NEA concept. . Testing and evaluation. <p>Exam preparation (50%):</p> <ul style="list-style-type: none"> . Based on core and specialist technical principles and designing and making principles. In addition; maths and science will be covered, which contribute to 15% and 10% of the exam. 	<p>Exam preparation:</p> <ul style="list-style-type: none"> . Based on core and specialist technical principles and designing and making principles. In addition; maths and science will be covered, which contribute to 15% and 10% of the exam. 	<p>Exam preparation:</p> <ul style="list-style-type: none"> . Based on core and specialist technical principles and designing and making principles. In addition; maths and science will be covered, which contribute to 15% and 10% of the exam.
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<p>Year 12 Product Design</p>	<p>Product analysis of plastic torches:</p> <ul style="list-style-type: none"> . Introduce task. . Create retrospective specification. . Evaluate chosen torch against specification. . Complete retrospective specification and evaluation for product. . Identification of torch materials with reference to properties, justification, alternatives. . Analysis of processes used in production of torch. Identify/describe process. Justify use of process and suggest possible alternatives. . Identify and describe QC checks during manufacture, including quality standards. . Describe a QA system for the product. <p>Theory knowledge to support project:</p> <ul style="list-style-type: none"> . Thermo/thermosetting plastics, elastomers, polymer structures, properties and characteristics of plastics. . Sustainability around the manufacture and use of plastics, LCA and biodegradable plastics. . Plastic forming processes; injection and rotational moulding, extrusion, calendering. . QA, QC and TQM. 	<p>Blue sky plastic project:</p> <ul style="list-style-type: none"> . Introduce task. . Research plastic products. . Complete initial ideas and development. . Inclusion of third angle orthographic projection and presentation drawings. . Planning for making. . Completion of practical task. <p>Theory knowledge to support project:</p> <ul style="list-style-type: none"> . 3D sketching. . Layout and proportion . Enhancement methods. . Third angle orthographic projection. . Flow charts. <p>Design drawing skills.</p>	<p>Blue sky metal project:</p> <ul style="list-style-type: none"> . Introduce task. . Research metal products. . Complete initial ideas and development. . Inclusion of third angle orthographic projection and presentation drawings. . Planning for making. . Completion of practical task. <p>Theory knowledge to support project:</p> <ul style="list-style-type: none"> . Metal properties and characteristics table. Including advantages, disadvantages and applications. . Categories of metals: ferrous, non-ferrous and alloys. . Components: nuts and bolts, spacers, washers and screws. . Riveting. . Gears, bearings, bushes. . Cams and followers. . Processes: casting, milling and routing, drilling, turning, lathes, knurling and parting off. . Joining techniques: welding, brazing and soldering . Material removal: shearing, abrading, filing and grinding. . Heat treatment: hardening, tempering, normalising and annealing, 	<p>Blue sky packaging project:</p> <ul style="list-style-type: none"> . Timeline of design movements. . Introduce task. . Complete context and customer profile. . Research of chosen designer/movement. . Product analysis. . Design brief. . Specification. . Initial ideas and review. . Ideas development. . Development of surface graphics: layout, text, surface pattern, enhancements/finishes. . Completion of final idea. . Completion of working net. . 3D CAD image of finished product. <p>Theory knowledge to support project:</p> <ul style="list-style-type: none"> . Design movements: Arts and crafts, art nouveau, art deco, modernism, Bauhaus, streamlining, post modernism and Memphis. . Paper and board: processing, sustainability and genetic modification. . Types of paper/board. . Reasons for packaging. . Over packing issues. . Printing methods and finishes. . Die cutting/guillotining. . Printing QC. 	<p>Non-Exam Assessment: Independent design and make project:</p> <ul style="list-style-type: none"> . Introduction and start NEA. . Identification, investigation and justification of design possibilities and opportunities. . Complete context and design brief. . Investigation of the needs and wants of the client/end user and complete client introduction. <p>Exam preparation: Theory knowledge relating to exam subject content.</p>	<p>Non-Exam Assessment: Independent design and make project:</p> <ul style="list-style-type: none"> . Initial research; including ergonomic information, standards and sustainability. . Product analysis of existing commercial products. . Client interview. . Production of specification. . Complete initial ideas requirements. <p>Exam preparation: Theory knowledge relating to exam subject content.</p>
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<p>Year 13 Product Design</p>	<p>Non-Exam Assessment: Independent design and make project: . Initial design ideas and review. . Development of design ideas. . CAD modelling.</p> <p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>	<p>Non-Exam Assessment: Independent design and make project: . 3D modelling. . Further development of design ideas. . Investigation into materials. . Client review. . Completion of final design solution and review. . Manufacture of final prototype.</p> <p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>	<p>Non-Exam Assessment: Independent design and make project: . Planning of manufacture. . Manufacture of final prototype.</p> <p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>	<p>Non-Exam Assessment: Independent design and make project: . Manufacture of final prototype. . Testing and evaluating.</p> <p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>	<p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>	<p>Exam preparation:</p> <p>Theory knowledge relating to exam subject content.</p>
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