

2022-2023 Year 11 Curriculum and Assessment Plan for Key Stage 4 Design & Technology.

<p>The curriculum and assessment of pupils at this stage of education has been carefully designed to develop the creative, technical and practical skills needed to perform everyday tasks confidently. The curriculum is built to apply knowledge and understanding of skills to design and make high- quality prototypes and products for a range of different users. The Key Stage 4 curriculum develops pupils practical skills further to support them in further education and employment.</p>					
<p>Half Term 1: NEA</p> <p>NEA Completion of the sections below:</p> <ul style="list-style-type: none"> A01: Section A Identify, investigate & outline design possibilities. A01: Section B Producing a design brief and specification. A02: Section C Generate design ideas. <p>All pupils will be assessed by:</p> <p>Practice exam questions for mock exam. NEA Exam board mark scheme.</p> <p>Impact- Why do we teach this?</p> <p>Pupils must complete the NEA on time, this is worth a total of 50% of their overall grade for the course.</p> <p>Section A- Pupils gain knowledge of their chosen context. Section B- Pupils will set a brief and specification for their product. Section C- Pupils begin to design some initial ideas for their product.</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Primary and secondary research. Drawing techniques <p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p>Key Vocabulary: Client Task analysis User Primary and secondary research Analyse Aesthetics Client Environment Sustainability Functionality Density Toughness Hardness Brittle Malleability Ductile</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths- Dimensions Science- environment, energy Art- Drawing techniques 	<p>Half Term 2: NEA</p> <p>NEA Completion of the sections below:</p> <ul style="list-style-type: none"> A02: Section C Generate design ideas. A02: Section D Developing design ideas. Design & make prototypes that are fit for purpose. <p>All pupils will be assessed by:</p> <p>Practice exam questions for mock exam. NEA Exam board mark scheme</p> <p>Impact- Why do we teach this?</p> <p>Pupils must complete the NEA on time, this is worth a total of 50% of their overall grade for the course.</p> <p>Section C- Pupils continue to design some initial ideas for their product, annotating their designs in depth. Pupils will evaluate their initial ideas. Section D- Pupils will develop a range of modelling to test and evaluate their designs, paying close attention to the iterative design process.</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Drawing techniques CAD CAM Modelling techniques prototyping <p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions, analysis and evaluating</p> <p>Key Vocabulary: Commercial process/ product Conceptual stages Continuous improvement Ethics Iterative design User Production techniques Production aids Model Anthropometrics Ergonomics</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths- dimensions Science- Sustainability, the environment. Art- Designing, drawing techniques. 	<p>Half Term 3: NEA</p> <p>NEA Completion of the sections below:</p> <ul style="list-style-type: none"> A02: Section E Realising design ideas. Making. A03: Section F Analyse & evaluate <p>All pupils will be assessed by:</p> <p>Practice exam questions for mock exam. NEA Exam board mark scheme</p> <p>Impact- Why do we teach this?</p> <p>Section E- Pupils will make their product using a range of tools and equipment. Section F- Pupils will evaluate their prototype, paying particular attention to the iterative design process, evaluating their prototype against the design brief and specification.</p>	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Use of CAD CAM- 2D design, Onshape, laser cutter and the 3D printer, use of a range of tools and equipment in DT. Evaluating <p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p>Key Vocabulary: Functionality Nesting Prototype Social responsibility Tolerance Working properties Join Finish Construct Evaluate Manufacture Modify Develop</p> <p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths-Dimensions. Science- Sustainability, the environment. RE- Social, moral and ethical issues. Art- Designing, drawing techniques.
<p>Half Term 4: NEA</p> <p>Finalising the NEA.</p> <p>Areas for revision:</p> <ul style="list-style-type: none"> Design strategies (iterative, client based). 	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Analysing and evaluating. 	<p>Half Term 5: Revision</p> <p>Areas for revision:</p> <ul style="list-style-type: none"> Use of computer-based tools (CAD CAM- 2D design, power point, publisher). Energy & Mechanisms: 	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Active listening 	<p>Half Term 6: Revision</p> <p>Areas for revision:</p> <ul style="list-style-type: none"> Properties of Electronics (soldering, components, PCB). Production aids- jigs/ stencils/ 	<p>Subject specific skills being developed:</p> <ul style="list-style-type: none"> Active listening

<ul style="list-style-type: none"> Electronic systems (schematic drawings). 2 Designers- Ettore Sottass & Philippe Stark) 2 companies (Dyson/Apple/ Alessi/ Primark). Ecological, environmental, and social issues. Research and investigation (product analysis, search engines, primary and secondary sources). Briefs and specifications. <p>Exploring and developing ideas (isometric, orthographic, exploded, CAD, client feedback).</p>	<p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p>Key Vocabulary: Market research Primary & Secondary data Memphis Ettore Sottass Iterative design Design brief/ specification Prototype Lathe Research Design movements Perspective drawing Tolerances Orthographic Innovation Investigation Iterative design Design Specification Design Brief Generating Developing Prototype Analysing Evaluating</p>	<ul style="list-style-type: none"> Energy generation and storage (fossil fuels, batteries, portable power systems). Levers (1st, 2nd, 3rd order lever). Linkages (parallel, reverse). Gears (velocity, ratio, gear types). CAMS (toys, naming the CAM profile). Materials (hardness, malleable etc). Stocks forms (rod, dowel, sheet, roll, 3mm, 6mm). Finishing materials (galvanising, dip coating, polish, varnish, paint). Scales of manufacture (one off, mass etc.) Manufacturing processes for: Paper & Board (printing techniques). Timber (Making MDF, flat pack). Metals (brazing, welding) Polymers (injection moulding, vac forming, extrusion, blow moulding 	<p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p>Key Vocabulary: Composite Rotary Technical textile Reciprocating Just in time production (JIT) Metal foam Oscillating Technology push and pull Smart materials Linear Gear Properties Toughness Function Aesthetics Ductile Hardness Malleable, Natural Synthetic Hardwood Deforestation Standard components CNC Softwood, Fairtrade Seasoning, Jig Manufactured timber Sustainability Mould, Prototype</p>	<p>templates. Why are they used?</p> <ul style="list-style-type: none"> Ensuring accuracy- working within tolerances. Automation- use of robotics (apple). Crowd funding (raising money for a project, donating money). Virtual retail & marketing (web-based tools- email, website etc). Co-operatives (jointly run business). Fairtrade Planned Obsolescence Technology push and pull. Trends & Fashion CAD CAM (advantages and disadvantages). Lean manufacturing (eliminating all forms of waste, efficient and effective way of making products). Designing for disabled, inclusive and exclusive design. 	<p>Reading Skills needed for this unit: Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p>Key Vocabulary: Automation Fossil fuels Crowd funding Materials Input/ output Co-operative Nuclear Microcontroller Computer Aided Design (CAD) Computer Aided Manufacture (CAM)</p>
	<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths- Scale Science- Electronics Art- Drawing techniques. 		<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths- Scale Science- Electronics Art- Drawing techniques. History- Past and present designers 		<p>Opportunity for cross-curricular skill development</p> <ul style="list-style-type: none"> Maths- Scale Science- Electronics Art- Drawing techniques. History- Past and present designers
<p>Ensuring this curriculum meets the needs of all pupils: this curriculum has been designed to ensure pupils from all starting points will develop the key curriculum skills and knowledge identified. The curriculum design ensures that each unit forms part of the overall learning journey and there are opportunities for revisiting skills and linking together key pieces of knowledge. Whole Academy policies and practices are followed to tailor the delivery of the curriculum for individuals and groups of students. For example SEND students have individual learning profiles that outline needs/strategies to be used, Ongoing formative assessment and clear summative assessment points allow individual staff and departments to identify misconception and adjust curriculum appropriately.</p>					
<p>Enrichment opportunities:</p> <ul style="list-style-type: none"> Invention sessions Revision sessions Trip 					
<p>Career opportunities/ links: Electrician, website designer, graphic designer, interior designer, architect, product designer, advertising, design engineer, production manager, building- trade.</p>					