

**2022-2023 Year 10 Curriculum and Assessment Plan for Key Stage 4 Design & Technology.**

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><b>Half Term 1: Core principles.</b></p> <p><b>Theory content which will be taught:</b></p> <ul style="list-style-type: none"> <li>About industry</li> <li>Enterprise</li> <li>Culture and Society</li> <li>Renewable energy resources</li> </ul> <p><b>Practical Tasks:</b></p> <ul style="list-style-type: none"> <li>Skills stick</li> <li>Manufacture a range of wooden joints</li> <li>Manufacture a wooden photo frame</li> <li>Manufacture a metal coat hook</li> </ul> <p><b>All pupils will be assessed by:</b>                  Knowledge quiz                  Practice exam questions: Product analysis, Section C of the exam- analysing existing products.                  Practical assessment of photo frame                  DNA                  End of unit test</p> <p><b>Impact- Why do we teach this?</b></p> <p>Pupils need to have developed a knowledge and understanding of the impact of new and emerging technologies.</p> <p>First practical at GCSE, skills development.</p>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Safety in the workshop.</li> <li>Measuring and marking and cutting timber and metals.</li> <li>Use of the brazing hearth.</li> <li>Hand tools and equipment in the wood and metal workshop.</li> </ul> <p><b>Reading Skills needed for this unit:</b>                  Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>                  Automation                  Fossil fuels                  Crowd funding                  Materials                  Input/ output                  Co-operative                  Nuclear                  Microcontroller                  Computer Aided Design (CAD)                  Computer Aided Manufacture (CAM)</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- Dimensions</li> <li>Geography- Fairtrade</li> <li>Science- environment, energy</li> <li>Art- Drawing techniques</li> </ul>	<p><b>Half Term 2: Core principles.</b></p> <p><b>Theory content which will be taught:</b></p> <ul style="list-style-type: none"> <li>Energy storage systems</li> <li>Modern materials</li> <li>Smart materials</li> <li>Composite materials</li> <li>Technical textiles</li> <li>Systems approach to designing</li> <li>Mechanical devices</li> <li>Material properties and characteristics for timber, polymers, metals, textiles, and polymers.</li> </ul> <p><b>Practical Tasks:</b></p> <ul style="list-style-type: none"> <li>Manufacture a metal coat hook in a design of their choice.</li> <li>Create a polymer phone holder using the laser cutter.</li> <li>CAD work using 2D design and Onshape</li> </ul> <p><b>All pupils will be assessed:</b>                  Knowledge quiz                  Practice exam questions: Materials focus, electronics, Section A of the exam paper- Materials.                  Practical assessment of the coat hook                  DNA                  End of unit test                  Mock exam.</p> <p><b>Impact - Why do we teach this?</b></p> <p>Pupils need to understand how energy is generated and stored and how this is used as the basis for the selection of products and power systems.</p> <p>The unit also covers a range of different modern, composite materials and technical textiles.</p>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Measuring and marking and cutting timber and metals.</li> <li>Use of the brazing hearth.</li> <li>Hand tools and equipment in the wood and metal workshop.</li> <li>Use of CAD CAM- 2D design, Onshape, laser cutter and the 3D printer.</li> </ul> <p><b>Reading Skills needed for this unit:</b>                  Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>                  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</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- dimensions</li> <li>Science- Sustainability, the environment.</li> <li>Art- Designing, drawing techniques.</li> </ul>	<p><b>Half Term 3: Specialist technical principles.</b></p> <p><b>Theory content which will be taught:</b></p> <ul style="list-style-type: none"> <li>Selection of materials and components.</li> <li>Forces and stresses</li> <li>Social and ecological issues</li> <li>The 6R's of sustainability.</li> <li>Sources and origins.</li> <li>Modifications of materials.</li> <li>Shaping and forming.</li> <li>Manufacturing scales.</li> </ul> <p><b>Practical Tasks:</b></p> <ul style="list-style-type: none"> <li>CAD work using Onshape and 2D Design</li> <li>3D print an Alessi inspired soap dish.</li> </ul> <p><b>All pupils will be assessed:</b>                  Knowledge quiz                  Practice exam questions                  Practical assessment of the Alessi inspired soap dish.                  DNA                  End of unit test</p> <p><b>Impact - Why do we teach this?</b></p> <p>To develop knowledge and understanding of timbers; social issues, sustainability and the 6R's and how they are applied to wood based products.</p> <p>Pupils need to know the stock forms of materials, how they are sourced and converted into as usable form, the effect materials have during their life, properties of timber, commercial</p>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Use of CAD CAM- 2D design, Onshape, laser cutter and the 3D printer</li> </ul> <p><b>Reading Skills needed for this unit:</b>                  Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>                  Hardwood                  Deforestation                  Standard components                  CNC                  Softwood, Fairtrade                  Seasoning, Jig                  Manufactured timber                  Sustainability                  Mould, Prototype</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- Dimensions.</li> <li>Science- Sustainability, the environment.</li> <li>RE- Social, moral and ethical issues.</li> </ul>
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<p><b>Half Term 4: Specialist technical principles/ design and making principles.</b></p> <p><b>Theory content which will be taught:</b></p> <ul style="list-style-type: none"> <li>Wasting and deforming</li> <li>Measuring and marking out</li> <li>Commercial processes</li> <li>Quality control</li> <li>Surface preparation and finishes</li> <li>Investigation primary and secondary</li> <li>Writing a design brief and specification</li> </ul> <p><b>Practical Tasks:</b></p> <ul style="list-style-type: none"> <li>Candle holder using the wooden lathe.</li> <li>Mood lighting.</li> </ul> <p><b>All pupils will be assessed:</b>          Knowledge quiz          Practice exam questions: Commercial processing. Section B of the exam paper.          DNA          End of unit test</p> <p><b>Impact - Why do we teach this?</b></p> <p>Pupils will have developed a knowledge and understanding of: how to use measurements and reference points, templates and production aids to ensure accuracy. Working within tolerances, quality control and quality assurance. Pupils will understand a range of material finishes, uses for that finish and how they</p>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Use of the lathe.</li> <li>Soldering</li> <li>Electronics</li> <li>Pupils will use a wide range of tools and machinery to manufacture a light of their own design.</li> </ul> <p><b>Reading Skills needed for this unit:</b>          Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>          Property, Template          Veneer          Laminating, Turning          Datum surface          Adhesive          Biodegradable          Wasting          Quality assurance</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- Scale</li> <li>Science- Electronics</li> <li>Art- Drawing techniques.</li> </ul>	<p><b>Half Term 5: Design and making principles.</b></p> <p><b>Theory content which will be taught:</b></p> <ul style="list-style-type: none"> <li>Past and present designers</li> <li>Design companies</li> <li>Generating, exploring and developing ideas</li> <li>Prototyping</li> <li>Materials and components</li> <li>Manufacturing techniques and processes</li> </ul> <p><b>Practical Tasks:</b></p> <ul style="list-style-type: none"> <li>Candle holder using the wooden lathe.</li> <li>Mood lighting.</li> </ul> <p><b>All pupils will be assessed:</b>          Knowledge quiz          Practice exam questions: Commercial processing. Section B of the exam paper.          Section C of the exam- Designers.          DNA          End of unit test          Mock exam</p> <p><b>Impact - Why do we teach this?</b>          Pupils will learn the importance of a design brief, and specification. Pupils will extract relevant information from sources and interpret data to identify a design need or opportunity.</p> <p>Pupils will explore a range of design movements from the last few centuries and investigate the work of designers linked to those art movements. Pupils will learn of their importance in developing new technologies, styles or fashions.</p>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Use of the lathe.</li> <li>Soldering</li> <li>Electronics</li> <li>Pupils will use a wide range of tools and machinery to manufacture a light of their own design.</li> </ul> <p><b>Reading Skills needed for this unit:</b>          Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>          Market research          Primary &amp; Secondary data          Memphis          Ettore Sottsass          Iterative design          Design brief/ specification          Prototype          Lathe          Research          Design movements          Perspective drawing          Tolerances          Orthographic          Innovation</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- Scale</li> <li>Science- Electronics</li> <li>Art- Drawing techniques.</li> <li>History- Past and present designers</li> </ul>	<p><b>Half Term 6: Coursework/ Revision</b></p> <p><b>Theory content which will be taught:</b>          NEA contexts will be released, pupils will begin their NEA.          Pupils will revise fir their upcoming mock exams</p> <p><b>All pupils will be assessed:</b>          Pupils coursework will be assessed by the class teacher and then moderated by an AQA Exams Officer. Pupils will be given the marking criteria for each section of the coursework for guidance.</p> <p><b>Impact- Why do we teach this?</b></p> <ul style="list-style-type: none"> <li>50% of the pupils grade is from the NEA (coursework) they begin this coursework in June of year 10.</li> </ul>	<p><b>Subject specific skills being developed:</b></p> <ul style="list-style-type: none"> <li>Independent study skills, pupils each design, make and evaluate their coursework.</li> </ul> <p><b>Reading Skills needed for this unit:</b>          Skim/Scan, summarising key information, drawing key conclusions analysis and evaluating</p> <p><b>Key Vocabulary:</b>          Investigation          Iterative design          Design Specification          Design Brief          Generating          Developing          Prototype          Analysing          Evaluating</p> <p><b>Opportunity for cross-curricular skill development</b></p> <ul style="list-style-type: none"> <li>Maths- Scale</li> <li>Science- Electronics</li> <li>Art- Drawing techniques.</li> </ul>

<p>are applied, both for one-off and industrial production methods.</p>		<p>Pupils will have an understanding of: how to use a variety of media and equipment to produce models and mock-ups as a means of communication. They will know how to create a range of 2D and 3D methods for communicating design ideas. How to select and use materials and components appropriate to the task.</p>			<p>English – descriptive writing, spelling.</p>
<p><b>Ensuring this curriculum meets the needs of all pupils:</b> 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><b>Enrichment opportunities:</b></p> <ul style="list-style-type: none"> <li>● Invention sessions</li> <li>● Revision sessions</li> <li>● Trip</li> </ul>					
<p><b>Career opportunities/ links:</b> Electrician, website designer, graphic designer, interior designer, architect, product designer, advertising, design engineer, production manager, building- trade.</p>					