

# Design & Technology



## Head of Department: Mr J. Harvey

## Year 7

In Years 7, pupils will experience working in a range of material areas and undertaking various design and make projects and focus practical tasks that will build on their learning from KS2. For many students, this will be the first time they have experienced being in practical workshops and food preparation areas. Pupils are taught the design process and study aspects of it which culminate in producing products. Throughout the course, students will also develop DT math skills to enable them to make use of measuring and accurately use standard units of length and weight.

	Autumn 1	Autumn 2
<b>Focus/ Context for Learning</b>	<p>Drawing skill/Health &amp; Safety</p> <p>Students will learn about the different graphical techniques used by designers.</p> <ul style="list-style-type: none"> <li>Graphical/Drawing Skills</li> <li>Understanding contexts, users and purposes.</li> </ul> <p><b>Drawing Skills:</b></p> <ul style="list-style-type: none"> <li>Introduction to drawing techniques.</li> <li>Introduction to CAD/CAM.</li> <li>Presentation techniques.</li> <li>H&amp;S/Risk Assessment</li> <li>Health &amp; Safety poster.</li> <li>Key words vocabulary</li> <li>3D sketching to model ideas.</li> </ul>	<p><b>DESIGNING &amp; MODELLING:</b> Understanding contexts, users and purposes</p> <p><b>Structures Project:</b> Students will learn about the application of the principles of structures for design and stability.</p> <ul style="list-style-type: none"> <li>Research and analysis</li> <li>Design brief &amp; specifications</li> <li>Generating, developing &amp; modelling ideas</li> <li>Technical Knowledge – Applying knowledge of materials, equipment, science and maths to help design and make products that work.</li> <li>Testing &amp; Evaluation</li> </ul>
	Spring 1	Spring 2
<b>Focus/ Context for Learning</b>	<p><b>Introduction to electric circuits and soldering:</b> Students will learn how to build a simple electronic circuit using solder joints.</p> <p><b>THEORY:</b></p> <ul style="list-style-type: none"> <li>Technical drawing; 3<sup>rd</sup> angle view.</li> <li>CAD – build on previous knowledge on Sketch UP.</li> <li>Iterative design process</li> <li>Evaluation and annotation of work.</li> <li>Presentation.</li> <li>Simple circuits, parallel and series.</li> </ul>	<p><b>PRACTICAL:</b></p> <ul style="list-style-type: none"> <li>Steady Hand Game; Design &amp; build a small electronic hand held game.</li> <li>Use of Coping saw to cut finger joint for the base.</li> <li>Use of soldering Iron &amp; components to create a working circuit for the game.</li> </ul>
	Summer 1	Summer 2
<b>Focus/ Context for Learning</b>	<p><b>Project: Cooking and Nutrition</b></p> <p>Students will learn about the principles of nutrition and health. They will also understand the sources and characteristics of different ingredients.</p> <p><b>Basic cooking recipe:</b></p> <ul style="list-style-type: none"> <li>Fruit salad</li> <li>Pizza baguette</li> <li>Vegetable noodles</li> </ul>	<p><b>Skills, knowledge &amp; understanding</b></p> <ul style="list-style-type: none"> <li>Sensory Analysis</li> <li>Staple Foods</li> <li>Knife skills/safe use of kitchen equipment</li> <li>Analysing &amp; Evaluating food products</li> <li>Cultural food</li> <li>Healthy Eating (The Eatwell Plate)</li> <li>Hygienic Food Preparation</li> <li>Food presentation</li> </ul>

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## Year 8

Year 8 builds on the previous year and each project is designed to underpin key skills and concepts taught in year 7. It acts as a foundation course for KS4. The projects extend pupils' knowledge and experience in designing for a client and give them the opportunity to discuss and consider in more depth other aspects of design such as environmental factors, manufacturing processes and the work of famous designers.

Students are given a broad understanding of most of the areas of the design process that will enable them to undertake the DT GCSE course should they opt for it at the end of Year 8.

Students will be assessed against the first four standards (Designing, Making, Evaluation and Technical Knowledge) for the duration of the course.

	Autumn 1	Autumn 2
<b>Focus/ Context for Learning</b>	<b>Project: Clock Project</b> Students will design and make a clock in the style of a designer of design movement. <ul style="list-style-type: none"> <li>Drawing and sketching skills</li> <li>The design process</li> <li>Research skills and Product Analysis</li> <li>History of clocks</li> <li>Design strategies</li> <li>Writing a brief/specification</li> <li>Key words vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>Iterative process: Developing /modelling ideas</li> <li>ICT in design and making</li> <li>Exploring and selecting materials.</li> <li>Plan for making</li> <li>H&amp;S/Risk Assessment</li> <li>CAD/CAM</li> <li>Manufacturing/Production methods</li> <li>Testing/modifying and evaluating final outcome</li> </ul>
	Spring 1	Spring 2
<b>Focus/ Context for Learning</b>	<b>Project: Mobile Phone Holder</b> <b>THEORY:</b> <ul style="list-style-type: none"> <li>Iterative Design process</li> <li>History of the Mobile Phone – Market pull vs design push.</li> <li>CAD / CAM how to set up files for the laser cutter.</li> <li>Properties of Timber.</li> </ul>	<b>PRACTICAL:</b> <ul style="list-style-type: none"> <li><b>Drawing Skills</b> are covered in the Booklet, 1+2 point perspective, Orthographic, shading &amp; rendering.</li> <li><b>MOBILE PHONE HOLDER;</b> Design &amp; build a mobile phone holder for a specific target market. Using research to help with the design process and development of the idea.</li> <li><b>Modelling;</b> Create a high level Acrylic product on the laser cutter.</li> </ul>
	Summer 1	Summer 2
<b>Focus/ Context for Learning</b>	<b>Protect: Cooking &amp; Nutrition</b> <b>THEORY:</b> <ul style="list-style-type: none"> <li>Food Hygiene, Eat well plate, basics of using the food room, washing up, importance of storage.</li> <li>How to write a recipe.</li> <li>Small mini coursework project to run alongside the practical element, focus on research &amp; presentation of ideas.</li> </ul>	<b>PRACTICAL:</b> <ul style="list-style-type: none"> <li>We will be cooking 3 different recipes over a 6/8 week period.</li> <li>Safe use of a knife, amongst other tools used in the kitchen.</li> <li>How to safely use a hob, an oven &amp; grill.</li> <li>Small D&amp;T project in the workshop – focus on key skills using hand tools, carousel to increase confidence in the workshop</li> </ul>

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## Year 9

In year 9, students will be encouraged to work more independently, consolidating and improving on their knowledge and understanding of materials and processes explored in year 8. There will be opportunities for students to further improve on their practical skills and diversify in the range of materials, components; tools and equipment used including CAD/CAM. Teaching and learning will be challenging and robust, consisting of a variety of formal skills teaching; 'learning through doing' practical activities and skills building; research methods; creativity & problem solving, maths skills, retrieval practices, questioning and reflective evaluations (self, peer and group opportunities).

AQA	Autumn 1	Autumn 2
<b>Focus/ Context for Learning</b>	<b>THEORY</b> <ul style="list-style-type: none"> <li>Properties of materials Wood &amp; smart materials</li> <li>Joining wood-based materials</li> <li>Roles of the client, users, designers &amp; manufacturers.</li> <li>Art &amp; Design Movements.</li> </ul>	<b>PRACTICAL</b> <ul style="list-style-type: none"> <li><b>IMPROVE A HOUSEHOLD OBJECT;</b> Research &amp; Iterative design process come up with an innovative solution.</li> <li>Modelling; Create a model of their design for HW but create a high level final product using Laser cutter at School.</li> </ul>
	Spring 1	Spring 2
<b>Focus/ Context for Learning</b>	<b>THEORY</b> <ul style="list-style-type: none"> <li>History of Aeroplanes * aeronautical engineering.</li> <li>CAD?CAM skills.</li> <li>Roles of the client, users, designers &amp; manufacturers.</li> <li>Air resistance.</li> </ul>	<b>PRACTICAL</b> <ul style="list-style-type: none"> <li><b>MAKE A PLANE THAT CAN FLY 360*;</b> Research aeronautical engineering &amp; History of aeroplanes. Then design own aircraft of SKETCH UP.</li> <li>Modelling; Create a model of their design for HW but create a high level final product using Laser cutter at School &amp; hand tools in the workshop.</li> </ul>
	Summer 1	Summer 2
<b>Focus/ Context for Learning</b>	<b>THEORY:</b> <ul style="list-style-type: none"> <li>Food Hygiene, Eat well plate, basics of using the food room, washing up, importance of storage.</li> <li>How to write a recipe</li> <li>Summative assessment of all THEORY learnt in KS3 and prepare students for product Design @ KS4.</li> </ul>	<b>PRACTICAL:</b> <ul style="list-style-type: none"> <li>We will be cooking 3 different recipes over a 6/8 week period.</li> <li>Safe use of a knife, amongst other tools used in the kitchen.</li> <li>How to safely use a hob, an oven &amp; grill.</li> <li>Small D&amp;T project to finish the year. ( keyskills for KS4</li> </ul>

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**Year 10**

The course will focus on producing creative and iterative design work and innovative practical work utilising an increasing use of CAD, workshop tools and equipment and CAM. It will allow students the opportunity to explore and perfect new skills and techniques whilst developing confidence and experience with specialist equipment and materials where possible. Students are required to undertake the iterative design process of exploring, creating and evaluating. The majority of the course will be delivered through theory and practical activities. Retrieval methods and testing for revision will be taught and encouraged.

AQA	Autumn 1		Autumn 2	
	Focus/Context for Learning		Focus/Context for Learning	
	<b>Specialist Technical Principle</b> <ul style="list-style-type: none"> <li>• Selection of materials</li> <li>• Forces and stresses</li> <li>• Ecological &amp; social footprint.</li> <li>• Sources &amp; origins of materials</li> <li>• Stock forms: types &amp; sizes</li> <li>• Practical Focus Tasks</li> </ul> <b>Assessment:</b> regular test and exam practice questions.		<b>Specialist Technical Principles</b> <ul style="list-style-type: none"> <li>• Scales of production</li> <li>• Specialist techniques &amp; processes</li> <li>• Surface treatments &amp; finishes</li> </ul> <b>Mini NEA Project 1 - (TBD)</b> Assessment Objective 1 (AO1) <ul style="list-style-type: none"> <li>• Explore design context</li> <li>• Identify needs and wants</li> <li>• Identifying &amp; investigating design possibilities.</li> </ul> <b>End of term exam</b>	
	Spring 1		Spring 2	
	Focus/Context for Learning		Focus/Context for Learning	
	<b>Designing &amp; making principles</b> <ul style="list-style-type: none"> <li>• Research and Investigate</li> <li>• Sustainability challenge</li> <li>• Design strategies</li> <li>• Anthropometrics &amp; Ergonomics.</li> </ul> <b>Mini NEA Project</b> <ul style="list-style-type: none"> <li>• Generate design Ideas/proposals</li> <li>• Refine and develop Ideas using the <b>iterative</b> design process</li> <li>• Final design idea</li> </ul>		<b>Designing &amp; making principles</b> <ul style="list-style-type: none"> <li>• Prototype development</li> <li>• Tolerances</li> <li>• Manufacturing processes</li> </ul> <b>Mini NEA Project - continued</b> AO2 – Design and make prototype that are fit for purpose <ul style="list-style-type: none"> <li>• Production of prototype</li> <li>• Testing and evaluation</li> </ul> <b>Assessment:</b> regular test and exam practice questions.	
	Summer 1		Summer 2	
	Focus/Context for Learning		Focus/Context for Learning	
	<b>Core technical principles</b> <ul style="list-style-type: none"> <li>• New &amp; emerging technologies</li> <li>• Energy generation and storage</li> <li>• New and modern materials</li> <li>• Mechanical devices</li> </ul> <b>Revision for Assessment Point 2</b> <ul style="list-style-type: none"> <li>- regular test &amp; exam practice questions and mark schemes.</li> </ul> <b>End of term exam.</b>		<b>AQA - NEA Contextual Challenge</b> <ul style="list-style-type: none"> <li>• Introduce NEA contextual challenge from exam board (AQA).</li> </ul> <b>Assessment Objective 1 (Summer holiday)</b> <ul style="list-style-type: none"> <li>• Identifying and investigating design possibilities.</li> <li>• Consider a range of design brief</li> <li>• Specification</li> <li>• Design proposals (rough models and annotated sketches).</li> </ul>	

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**Year 11**

In year 11, students will continue and complete their NEA coursework which will be assessed on their ability to investigate, design, make, analyse and evaluate their contextual challenge. Students will have to explore their context, develop a design brief and submit a prototype and folder that provides evidence of the decisions and skills used in investigating, designing, making and evaluating their prototype. Teaching and learning will be challenging and robust, consisting of a variety of formal skills teaching; 'learning through doing' practical activities and skills building; maths skills, retrieval practices, questioning and reflective evaluations (self, peer and group assessment opportunities).

Students will revisit, revise and assess on all exam topics in preparation for their final written examination. **Retrieval methods and testing for revision will be taught and encouraged.**

Assessment: 1 Written Exam (2 Hours) - 50% of GCSE and Non-Exam Assessment – 50% of GCSE.

AQA	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	<b>Assessment Objective (AO1):</b> The NEA 'iterative design and make challenge on the iterative processes of explore, create and evaluate. <ul style="list-style-type: none"> <li>• Explore the Contextual Challenges</li> <li>• Outline a Design Problem</li> <li>• Identify the needs of the End User</li> <li>• Investigate Existing Products</li> <li>• Research planning</li> <li>• Design Brief and Specification</li> <li>• Design strategies/Initial Ideas</li> <li>• Review and evaluate Initial Ideas</li> </ul> <b>Assessment:</b> regular test and exam practice questions.	<b>Design and make prototypes:</b> <ul style="list-style-type: none"> <li>• Developing and Refining</li> <li>• Design Ideas</li> <li>• Modelling ideas – CAD/CAM</li> <li>• Final Design Idea</li> <li>• Working drawings</li> <li>• Manufacturing specification</li> <li>• Production of Prototype</li> </ul> <b>Mock exam 2 Preparation/revision</b>
	Spring 1	Spring 2
<b>Focus/Context for Learning</b>	<b>Assessment Objective (AO3):</b> <ul style="list-style-type: none"> <li>• Working drawings</li> <li>• Manufacturing specification and costing</li> <li>• DT mathematical skills</li> <li>• Manufacturing</li> <li>• Modifications for mass production</li> <li>• Testing and evaluation of final prototype.</li> </ul>	<b>Final Exam Revision &amp; Preparation:</b> <ul style="list-style-type: none"> <li>• Core technical principles</li> <li>• Specialist technical principles</li> <li>• Designing &amp; making principles</li> <li>• <b>Exam practice</b> - Past exam papers and mark schemes.</li> <li>• Study &amp; Exam techniques</li> </ul>
	Summer 1	Summer 2
<b>Focus/Context for Learning</b>	<ul style="list-style-type: none"> <li>• Revision and exam practice - past exam papers and mark schemes</li> <li>• Final written exam (2hr written paper)</li> </ul>	