

Design & Technology



Head of Department: Mr L. Northey

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
Focus/ Context for Learning	<p>Drawing skill/Health & Safety</p> <p>Students will learn about the different graphical techniques used by designers.</p> <ul style="list-style-type: none"> Graphical/Drawing Skills Understanding contexts, users and purposes. <p>Drawing Skills:</p> <ul style="list-style-type: none"> Introduction to drawing techniques. Introduction to CAD/CAM. Presentation techniques. H&S/Risk Assessment Health & Safety poster. Key words vocabulary 3D sketching to model ideas. 	<p>DESIGNING & MODELLING: Understanding contexts, users and purposes</p> <p>Structures Project: Students will learn about the application of the principles of structures for design and stability.</p> <ul style="list-style-type: none"> Research and analysis Design brief & specifications Generating, developing & modelling ideas Technical Knowledge – Applying knowledge of materials, equipment, science and maths to help design and make products that work. Testing & Evaluation https://www.mggs.org/wp-content/uploads/Year-7-Curriculum-Booklet-2019-20-Final.pdf
	Spring 1	Spring 2
Focus/ Context for Learning	<p>Introduction to electric circuits and soldering: Students will learn how to build a simple electronic circuit using solder joints.</p> <p>PROJECT: Electronic Hand Game</p> <ul style="list-style-type: none"> System and control Electronic components Evaluating/modifying/testing Electronic circuits Flow chart for making Soldering technique 	<p>Practical Focus Task:</p> <p>Students will learn about and design different types of card mechanisms that can create movement.</p> <p>Pop-up card mechanisms:</p> <ul style="list-style-type: none"> Properties of paper and card Types of card mechanisms Styles of Writing/Typography Design & make different types of pop-up mechanisms.
	Summer 1	Summer 2
Focus/ Context for Learning	<p>Project: Cooking and Nutrition</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>Basic cooking recipe:</p> <ul style="list-style-type: none"> Fruit salad Apple crumble Pizza bread Bread roll/vegetable soup 	<p>Skills, knowledge & understanding</p> <ul style="list-style-type: none"> Sensory Analysis Staple Foods Knife skills/safe use of kitchen equipment Analysing & Evaluating food products Cultural food Healthy Eating (The Eatwell Plate) Hygienic Food Preparation Food presentation

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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
Focus/ Context for Learning	<p>Project: Clock Project Students will design and make a clock in the style of a designer of design movement.</p> <ul style="list-style-type: none"> • Drawing and sketching skills • The design process • Research skills and Product Analysis • History of clocks • Design strategies • Writing a brief/specification • Key words vocabulary 	<ul style="list-style-type: none"> • Iterative process: Developing /modelling ideas • ICT in design and making • Exploring and selecting materials. • Plan for making • H&S/Risk Assessment • CAD/CAM • Manufacturing/Production methods • Testing/modifying and evaluating final outcome
	Spring 1	Spring 2
Focus/ Context for Learning	<p>Project: Mechanism Project</p> <ul style="list-style-type: none"> • Task analysis and design brief • Research skills • Communicating design ideas • Mechanisms/Motions • Development/modelling including CAD • Joining techniques. 	<ul style="list-style-type: none"> • Working Drawings • Plan for making • Manufacturing including CAM • Quality Control • Surface finishes for wood • Assembling processes • Testing and Evaluation
	Summer 1	Summer 2
Focus/ Context for Learning	<p>Project: Lighting device (PFT) Students will design and make a battery powered LED 'mood light' from recycling materials.</p> <ul style="list-style-type: none"> • Design brief/specification • Key words • Electronic circuits & components • Manufacturing processes • Testing and evaluation 	<p>Project: Cooking and Nutrition Students will learn about the principles of nutrition, health and cook a range of food safely and hygienically.</p> <ul style="list-style-type: none"> • Food hygiene and safety • Product Analysis on food products • ICT in Food Technology • Theory on diet, fibre, vitamins & minerals. • Wise food shopping/costing <p>Projects: Vegetable soup, Macaroni cheese, Carrot muffin, Bread roll.</p>

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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
Focus/ Context for Learning	<p>Project: Design and market influences</p> <ul style="list-style-type: none"> • Role of client, user, designer & Manufacturer • Market Pull and Technology Push • Materials & their working properties • Design movement/Design strategies • Sketching/formal 2D, 3D drawings <p>Manufacturing Processes</p> <ul style="list-style-type: none"> • Forming and moulding materials • Specialist tools, equipment & processes • Surface treatments and finishes • Joining materials • Using CAD/CAM (Polymer focus) • Health & Safety/Risk Assessment 	<p>Mini NEA project: . Multifunctional living.</p> <ul style="list-style-type: none"> • Analysis of context/Task analysis • Customer profile • Product analysis/moodboard • Design brief/Specification • Design proposals in the style of..... • Development (iterative process) • Manufacture, QA & QC • Testing & Evaluation
	Spring 1	Spring 2
Focus/ Context for Learning	<p>Project: Furniture modelling Seating solution – designing & modelling through the iterative process without having to make.</p> <ul style="list-style-type: none"> • Designers & design companies • Design strategies • Types and properties of materials. • Smart, modern & composite materials • Forces and stresses – ways to reinforce materials 	<p>Furniture modelling continued:</p> <ul style="list-style-type: none"> • Scaled modelling • Templates and jigs • Modelling materials • Manufacturing processes • Manipulating & combining materials. • Standard components • Specialist techniques and processes • Prototype development • Testing and evaluation
	Summer 1	Summer 2
Focus/ Context for Learning	<p>Project: Environmental Project (Recycling bin)</p> <ul style="list-style-type: none"> • New and emerging technologies • Product analysis and evaluation • The six R's • Analysing the design context 	<p>Environmental Project</p> <ul style="list-style-type: none"> • Design Ideas & Modelling (Iteration) • Commercial processes • Prototype • Testing and evaluation

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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	<p>Specialist Technical Principle</p> <ul style="list-style-type: none"> • Selection of materials • Forces and stresses • Ecological & social footprint. • Sources & origins of materials • Stock forms: types & sizes • Practical Focus Tasks <p>Assessment: regular test and exam practice questions.</p>	<p>Specialist Technical Principles</p> <ul style="list-style-type: none"> • Scales of production • Specialist techniques & processes • Surface treatments & finishes <p>Mini NEA Project 1 - (TBD) Assessment Objective 1 (AO1)</p> <ul style="list-style-type: none"> • Explore design context • Identify needs and wants • Identifying & investigating design possibilities. <p>End of term exam</p>

	Spring 1	Spring 2
Focus/Context for Learning	<p>Designing & making principles</p> <ul style="list-style-type: none"> • Research and Investigate • Sustainability challenge • Design strategies • Anthropometrics & Ergonomics. <p>Mini NEA Project</p> <ul style="list-style-type: none"> • Generate design Ideas/proposals • Refine and develop Ideas using the iterative design process • Final design idea 	<p>Designing & making principles</p> <ul style="list-style-type: none"> • Prototype development • Tolerances • Manufacturing processes <p>Mini NEA Project - continued AO2 – Design and make prototype that are fit for purpose</p> <ul style="list-style-type: none"> • Production of prototype • Testing and evaluation <p>Assessment: regular test and exam practice questions.</p>

	Summer 1	Summer 2
Focus/Context for Learning	<p>Core technical principles</p> <ul style="list-style-type: none"> • New & emerging technologies • Energy generation and storage • New and modern materials • Mechanical devices <p>Revision for Assessment Point 2</p> <ul style="list-style-type: none"> - regular test & exam practice questions and mark schemes. <p>End of term exam.</p>	<p>AQA - NEA Contextual Challenge</p> <ul style="list-style-type: none"> • Introduce NEA contextual challenge from exam board (AQA). <p>Assessment Objective 1 (Summer holiday)</p> <ul style="list-style-type: none"> • Identifying and investigating design possibilities. • Consider a range of design brief • Specification • Design proposals (rough models and annotated sketches).

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