



Curriculum Map: GCSE Design and Technology (8552)

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	<p>WEEKS 1-6 Students will design and research children's wooden toys and then start initial designs of their own, followed by creating model prototypes.</p> <p>3.1.6 Materials and their working properties</p> <ul style="list-style-type: none"> - Timbers - Metals - Polymers - Textiles <p>3.3.4 Designing; Wooden Toy Preliminary Work</p> <ul style="list-style-type: none"> - Sketching - Modelling - Design solutions for a moving toy - Annotation of design work - Developed designs - Evaluation of work - Modifications <p>3.1.5 Mechanical Devices</p> <ul style="list-style-type: none"> - Types of mechanism and motion - Split pin models - Produce working models <p>3.3.9 Marking methods, data points and co-ordinates and 3.3.10 Specialist Tools and Equipment</p> <ul style="list-style-type: none"> - Selecting appropriate tools - Cutting out, marking and shaping materials <p>Links to; sources and origins, finite/non-finite, maths</p> <p>Assessment; written evaluation and design work, modular test</p> <p>Skills: Numeracy (measuring), literacy, design, making, finishing</p>	<p>WEEKS 7-13 Students will develop their design work, create detailed designs and begin to mark out their chosen design and then make their toy.</p> <p>3.2.5 Using and working with materials</p> <ul style="list-style-type: none"> - Students shape parts of their toys in their chosen materials <p>3.3.4 Designing; Wooden Toy Preliminary Work</p> <ul style="list-style-type: none"> - Prototyping - Modelling to scale - Developed ideas - Evaluating ideas to improve outcome <p>3.3.5 Communication of Ideas</p> <ul style="list-style-type: none"> - Isometric and perspective, 2D or 3D - Choice of mechanism explained <p>3.3.9 Marking methods, data points and co-ordinates and 3.3.10 Specialist Tools and Equipment</p> <ul style="list-style-type: none"> - Measure and mark out in chosen materials - Knowledge of tools and techniques <p>3.3.11 Specialist Techniques and Processes</p> <ul style="list-style-type: none"> - Testing a range of treatments <p>Links to; maths,</p> <p>Assessment; Modular test</p> <p>Skills: Numeracy (measuring), literacy, design, making, finishing</p>	<p>WEEKS 14-19 Students will start to focus on furniture modelling. They will design seating based on a designer, consider CAD and material wastage.</p> <p>3.1.3 Development in new materials</p> <ul style="list-style-type: none"> - Smart materials <p>3.3.3 The work of others</p> <ul style="list-style-type: none"> - Design styles and philosophies researched - Modelling <p>3.1.6.1 Material Categories</p> <p>3.1.6.2 Material properties</p> <p>3.2.4 Sources and origins</p> <p>3.2.6 Stock forms, types and sizes</p> <ul style="list-style-type: none"> - Papers and boards linking to the four topics above <p>3.2.2 Forces and Stresses</p> <ul style="list-style-type: none"> - Buildings that have collapsed - Modelling structures with art straws - Re-enforcement of materials and subsequent use in buildings <p>3.3.4 Design Strategies</p> <ul style="list-style-type: none"> - Using forces and stress in designing seating - Initial designs for seating - Annotated designs <p>3.3.9 Material Management</p> <ul style="list-style-type: none"> - Use of CAD to reduce waste when cutting out - Exploration of tessellation/nesting - Students to modify their seating designs using this info and use CAD to develop designs. <p>3.2.8 Specialist Techniques and processes</p> <ul style="list-style-type: none"> - Lithography printing and die cutting - QC and working to tolerance <p>3.3.6 Prototype Development</p> <ul style="list-style-type: none"> - Use of CAD to develop scaled seating ideas - Designed in style of studied designer <p>3.2.7 Scales of Production</p> <ul style="list-style-type: none"> - Prototypes, batch, mass and continuous <p>Links to; stock size, cost, wastage</p> <p>Assessment; modular test</p>	<p>WEEKS 20-27 (two weeks short this term) Students will use CAD to develop their seating designs. They will look at manufacturing and then at groups of customers with specific needs. The design brief is then changed to task students with designing seating for customers with a specific problem. CAD, sketching and modelling ideas are trialled and tested</p> <p>Students to present their final ideas as a group with design ideas and models.</p> <p>3.1.1 Industry</p> <ul style="list-style-type: none"> - Use of robotics in batch/mass/continuous production. Design and organisation of the workplace to manufacture. <p>3.3.6 Prototype Development</p> <p>3.3.10 Specialist tools and equipment</p> <p>3.3.11 Specialist techniques and processes</p> <p>3.3.1 Production techniques and systems, use of CAD</p> <ul style="list-style-type: none"> - Use CAD to modify ideas - Continue to develop the scaled prototype - Design development - Laser cut ideas and evaluate <p>3.1.1 New and emerging technologies</p> <p>3.3.4 Design Strategies</p> <p>3.3.6 Prototype Development</p> <p>3.3.5 Communication of Ideas</p> <ul style="list-style-type: none"> - Re-issue the design brief – to design seating for their given audience - Identify groups that have particular needs - Research a particular audience and their needs and problems they encounter. - Building on learnt skills to work collaboratively - Use CAD, sketching and modelling – ideas and trialled and tested. <p>Links to; stock size, cost, wastage</p> <p>Assessment; Student presentations, end of module assessment</p> <p>Skills: Numeracy (measuring), literacy, design, making, finishing, communicating, CAD</p>	<p>WEEKS 28-35 Students will work as an 'enterprise team' and be given a brief of creating an environmental clock. The whole term is based on research, design, development of ideas with the majority of the second half of the term being to create the clock.</p> <p>3.1.1 New and emerging technologies</p> <p>3.3.4 Design Strategies</p> <p>3.3.1 Investigation, primary and secondary data</p> <p>3.1.2 Energy generation and storage</p> <p>3.2.3 Ecological and social footprint</p> <p>3.2.8 Specialist Techniques and processes</p> <p>3.3.5 Communication of Ideas</p> <p>3.3.6 Prototype Development</p> <p>3.3.10 Specialist tools and equipment</p> <p>3.3.11 Specialist techniques and processes</p> <ul style="list-style-type: none"> - Students to analyse the design brief - Design ideas produced to address the brief - Data analysis of energy sources and importance of sustainability - Research into storing energy - Developed design ideas using data on energy storage - Environmental impact of use of materials - Modifications to design ideas - Production of 3D models (can be scaled) - Students change their ideas based on one heading (obsolescence, design for maintenance, ethics or environment) - Manufacturing of similar products - Consideration of the six r's with further development of sketching in 2D and 3D - Students prototype their design and ensure they finish it using correct treatments and processes. - Demonstration of the product to ensure understanding of appropriate methods <p>Links to; geography, maths, commercial manufacture, design</p> <p>Assessment; Student presentations and end practical product, written end of year assessment</p>	
10	<p>Students look at case studies of factories (e.g Jaguar Land Rover/BMW) to look at robotics and further manufacturing systems. Students re-design an existing product for a specific consumer group that is environmentally friendly. Heavy theory focus looking at material development, energy and environment.</p> <ul style="list-style-type: none"> • New and Emerging Technologies; • Modern and Smart Technologies • Ethics • Renewable and Non-Renewable Energy resources • Critical evaluation • Sustainability and the environment • Mechanisms <p>Links to; year 9 – user groups, manufacture, environment</p> <p>Assessment; design work and end of module test.</p>	<p>Students are given a practice NEA style project to complete in order to introduce the idea of iterative thinking. Specialist technical principles are delivered through at least one material category.</p> <ul style="list-style-type: none"> • Primary investigation of materials • Analysis of products • Materials knowledge and properties • Create a phone stand/holder, develop design ideas for an MP3 docking station • Modify idea in order to make a quantity produce of part of the product. • Manufacture of the prototype using production aids, consider treatments and finishes, materials selection, quality control etc. • Reflection on designs and how they could be improved, how could the product be commercially manufactured. <p>Assessment; design work, practical work and written evaluation</p> <p>Skills: Numeracy (measuring), literacy, design, making, finishing, CAD, evaluating</p>	<p>Students are given a practice NEA style project that covers section 3.3 Project 2 (lighting). Building iteration into a project in preparation for the NEA in September of Year 11.</p> <ul style="list-style-type: none"> • Independent research into a designer/company. Range of sources to be used. • Understanding of design style, philosophy and products of that designer/company • Presentation of research and findings • Identification of a client and their user needs/wants • Explore and develop initial design ideas using sketching and modelling techniques • Anthropometrics and ergonomics considered • Prototyping in materials chosen to reflect students knowledge/understanding • Costing sheets using stock sizes • Use of jigs/aids in making • QC processes • Health and safety points demonstrated by students when making the product using specific tools • Diary/planning to track progress and learning • Final prototype to be made to a high standard • Consideration of the commercial production of the product <p>Assessment; design work, practical work and written evaluation plus summer mock exam for theory</p>			
11	<p>This term will spent solely on the NEA. The brief is given out for the start of Year 11. It is intended to be an iterative design process so the learning activities will be directed by the student and will depend on the project.</p> <p>Skills: Numeracy (measuring), literacy, design, analysing, making, finishing, CAD, evaluating, presentation.</p>	<p>NEA 1 continued.</p>	<p>NEA 1 continued.</p> <p>Formal Mocks</p>	<p>REVISION OF KEY TOPICS</p>	<p>REVISION OF KEY TOPICS</p> <p>Final Exams</p>	<p>Final Exams</p>