Design and Technology – Curriculum Map

KEY STAGE 3

Students will be encouraged to think creatively and develop an understanding of the basics of the design process including materials, form, iterative process, functionality, aesthetics, costs, environmental impacts, and sustainability.	
Year 7	**Rotation/ weekly lessons will run for a 10-week period apart from the last rotation which will run for a 9-week period.** • Week 1 – Introduction to design and technology, iterative design and health and safety in the workshop. • Week 2 – Paper design of key light in booklet • Week 3 – Introduction to 2D design software students draw a cup cake using the software tools. • Week 4 – Students design their key light • Week 5 – students design their key light • Week 6 – Students assemble the key light in the workshop. • Week 7 – Student complete worksheets on electronic components and their functions • Week 8 – Student complete worksheets on materials and their properties • Week 9 – Design of packaging • Week 10 – Construction and decoration of packaging
	Students will develop their design and creative skills to come up with a design for both sides of their key light. They will then develop their skills in using 2D design software, understanding the possibilities and limitations of the software and problem-solving skills in how to overcome or minimise any limitations. At GCSE a design brief is needed for a specific client, we are trying to get the students used to theses concept when considering who the key light could be aimed at and this should be reflected in the packaging as well.

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Year 8	**Rotation/ weekly lessons will run for a 10-week period apart from the last rotation which will run for a 9-week period.** ● Week 1 – Introduction to automata and their components, including cams, gears, axles and cam followers. Worksheets enable students to understand how different movements can be achieved with different cam shapes. ● Week 2+3 – Preparation of components parts using precise measurements and ● Week 4 – Construction of the base including insertion of axle and first cam. Base strengthening if necessary ● Week 5 – Insertion of second and third cams and second axle, testing to check for smooth movement. ● Week 6 – Completion of tower including working out where final axle will go. ● Week 7 +8 – Inserting final Cam(s) and testing alignment ● Week 9 +10 – Final testing of automaton and decoration ● (anyone who finished early can start the second choice of automaton
	Students will develop their organisational skills in deciding how to manage making the component parts and construction phases balancing this with waiting for availability of tools. GCSE requires knowledge of gears and ratios and the different movements that can be achieved through these. Students get and introduction to these concepts both through information and worksheets, PowerPoints and the practical implementation when building their automaton, they also get to try the iterative design process if they need to improve the design for better results this is also a key factor in GCSE, NEA and exam.

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Year 9	**Rotation/ weekly lessons will run for a 10-week period apart from the last rotation which will run for a 9-week period.** ● Week 1 – Timber properties theory in preparation for this content at GCSE ● Week 2 –Accurate measurements for the parts of the tea light holder done on paper with any designs for legs and shelf included ● Week 3 – Measurements transferred to wood and cutting started if ready. ● Week 4 – Cutting of wood into 3 parts to be completed and sanding continued ● Week 5 – Drilling of wells for tealight and sanding completed ● Week 6+7 – Cutting of pre-measured grooves for sliding bases into one another. ● Week 8 – Any adjustments needed to finalise a stable product, sanding, finishing, filing, sawing etc. ● Week 9+10 – Finishing and decorating, using water based or acrylic paint, varnish stickers etc.
	Across the 10-week project, students develop a strong understanding of timber properties while learning to plan and measure accurately, first on paper and then on wood. They gain hands-on woodworking skills including cutting, drilling, sanding, and creating joinery through pre-measured grooves. Throughout the making process, they practise problem-solving by adjusting components to improve the stability and quality of their tealight holder. Finally, they refine their craftsmanship through surface preparation and creative finishing techniques such as painting, varnishing, and decorating, resulting in a well-made final product. Students at GCSE will need knowledge of different materials and processes involved with their production and use. Timber being one of these materials so this links in with their specialist material at GCSE.

KEY STAGE 4

The GCSE – exam board AQA - consists of an examined unit and a non-examined unit (NEA)

What is assessed - core technical principles
Specialist technical principles
Designing and making principles

How it is assessed Written exam 2 hours
100 marks
50% of the GCSE

Non-Exam assessment (NEA)

What is assessed

Practical application of:

Core technical principles
Specialist technical principles
Designing and making principles

How it's assessed
NEA 30-40 hours approx.
100 marks
50 % of GCSE

Design and Technology – Curriculum Map

Year 10 and 11	***Students will develop the skills that are essential for success in the modern world and the future such as independent analytical thinking and innovation. problem solving, initiative and creative thinking, and product analysis***

1. Core Technical Principles

Students learn the fundamental knowledge that applies across all areas of design and technology, including:

- New and emerging technologies (automation, robotics, smart materials, energy storage).
- Sustainability and environmental impact (life-cycle analysis, responsible design, material sourcing).
- Systems approach to designing (input, process, output).
- Mechanical devices (levers, linkages, gears, pulleys, cams).
- Material properties (functional and mechanical), forces and stress, and testing materials.

2. Specialist Technical Principles

Students specialise in one material area (usually timbers, metals, polymers, textiles, or paper/board). They develop:

- Detailed understanding of material categories, properties, and working characteristics.
- Knowledge of stock forms, component types, and material finishes.
- Skills in manufacturing processes including cutting, joining, forming, shaping, and finishing.
- Understanding of commercial/industrial processes such as mass production, batch production, quality control, and quality assurance.

3. Designing and Making Principles

Students apply an iterative approach to design, drawing on real-world contexts. They develop:

- User-centred design skills (identifying needs, analysing design contexts).
- Research and investigation skills (interviewing users, exploring existing products).

	• Idea generation techniques (sketching, concept development, modelling). • Communication methods (2D drawings, 3D sketches, CAD, orthographic projection, exploded diagrams). • Prototyping skills using modelling materials, CAD/CAM, and iterative testing. • Evaluation skills (peer feedback, client reviews, testing against criteria). **4. Non-Exam Assessment (NEA) – 50% of the GCSE** Students complete a substantial design-and-make project based on one of three annual AQA contextual challenges. The NEA includes: • Identifying and investigating design possibilities. • Producing a design brief and specification. • Generating design ideas. • Developing, modelling, and reviewing design solutions. • Making a functional prototype using appropriate tools, machinery, and materials. • Testing and evaluating the final product against user needs and specification. The NEA focuses heavily on creativity, accuracy, problem-solving, documentation, and practical skills.
	Students develop a broad range of design, technical, and practical skills, beginning with the ability to research, analyse, and understand the needs of users and contexts. They learn to generate, communicate, and model design ideas using sketches, technical drawings, CAD software, and prototypes. Throughout the course, students apply their knowledge of materials, systems, forces, and manufacturing processes to make informed design decisions. They also build strong practical skills through safe and accurate use of tools, equipment, and machinery to shape, join, and finish materials. The syllabus strengthens students' abilities in problem-solving, iterative design, planning, and project management, as well as their understanding of industrial practices, sustainability, and the environmental impacts of design. Finally, students develop skills in evaluation, testing, and refinement to improve the quality and performance of their products.