

# DESIGN & TECHNOLOGY CURRICULUM: KS3

St. Margaret's Design & Technology / Food & Nutrition department strives to empower all students to the problem-solvers of the future – the designers, the engineers, the nutritionists, the makers. We establish relevant, coherent links with the world in which we live, making connections across other subject areas. We support, engage and challenge all students to be ambitious and creative, equipping them with a knowledge-rich understanding and the skills to experiment, invent and create their own products.

In KS3 the Design & Technology curriculum is delivered using a carousel system. There are 4 rotations in the carousel, which each last for 10 weeks. Each class in the year will complete all four rotations across the course of the year but they will start in different rotations.



	Rotation 1	Rotation 2	Rotation 3	Rotation 4
Year 7	<p>Unit 7.1: Health and safety . Raising awareness of hazards and risk reduction.</p> <p>Unit 7.2: Alien circuit board. Introduction to solving problems using electronic components. A battery powered transistor switching circuit which makes two LEDs flash. The circuit will be used for the “eyes” of an alien that will be manufactured in a complimentary unit, 7.3.</p>	<p>Unit 7.3: Alien body/ housing.</p> <p>Unit 7.3: The project provides the pupils with the opportunity to learn about the full design process and engage with a range of workshop practices, tools and equipment. They will respond to a brief and design within a set of constraints. They will make a Biomimicry inspired Alien body that will house the circuit board produced in Unit 7.2.</p>	<p>Unit 7.4: Structures - Car crash.</p> <p>Investigation of the 3 main types of structure. Dynamic and static forces and how this knowledge can be used to design and make products. Use compliant materials to model a a frame structure that strengthens a shell structure and then test it in a car crash simulation. An engaging activity that uses engineering skills to strengthen a shell structure (car body)so that it can withstand the impact of another vehicle.</p> <p>Unit 7.5: Computer Aided Design/Computer Aided Manufacture Introduction to industrial production methods using CAD/CAM. Introduction to the use of 2D Design CAD package. The pupils will design their own mobile phone stand which could also be manufactured in batches.</p>	<p>Food and Nutrition</p> <p>Please see the link on the website for the KS3 Food and Nutrition provision.</p>
Year 8	<p>Unit 8.1: Health and safety . Raising awareness of hazards and risk reduction.</p> <p>Unit 8.2: Sustainability Passive Amplifier: STEM, Materials and manufacturing, designers The pupils will design and make a passive amplifier made from resistant materials that can be used with their mobile phone. Cross-curricular links to other subjects including science and music by exploring the use of soundwaves and how to amplify them without the use of electronics. Pupils will explore the use of recognized design styles (eg Art Deco) when designing the surface finish of the amplifier</p>	<p>Unit 8.3: Retro game circuit: Development of electronics using programmable microcontrollers.</p> <p>Unit 8.3: This unit combines with Unit 8.4 to produce a retro style pick and place electronic game (similar to Operation). In this unit the pupils will produce the circuit board that will go into the housing that is produced in Unit 8.4.</p> <p>In this unit the pupils will build upon their knowledge of electronics from Y7 and will be introduced to the use of programmable microcontrollers (microchips).</p>	<p>Unit 8.4: Retro game casing: Industrial manufacture</p> <p>Unit 8.4: This unit combines with Unit 8.3 to produce a retro style pick and place electronic game (similar to Operation). In this unit the pupils will produce the casing that will house the circuit board that is produced in Unit 8.3. The pick and place game aims to develop manual dexterity and group participation. The board design can be selected from existing designs or generated by the pupil. Building upon their introduction to CAD/CAM in Y7 by use of the laser cutter for board game and pieces and possibly the use of 3D printers. Introduction to polymers and their uses including batch production. Investigation of the sustainability of polymer use for products.</p>	<p>Food and Nutrition</p> <p>Please see the link on the website for the KS3 Food and Nutrition provision.</p>

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Year 9	<p>Unit 9.2: Angle poise lamp Circuit: Development of electronics using programmable microcontrollers.</p> <p>Unit 9.2 combines with unit 9.3 to product an Angle-poise programmable lamp.</p> <p>In this unit the pupils will build upon their knowledge of electronics from Y8 and will further their ability to use programmable microcontrollers (microchips).</p> <p>The IC can be programmed to respond in accordance with the requirements generated by the pupil. E.g the lamp can have several different settings, low illumination, high illumination, sleep timer.</p>	<p>Unit 9.3: Angle poise lamp: Sustainable Industrial Design</p> <p>Unit 9.3 combines with unit 9.2 to product an Angle-poise programmable lamp.</p> <p>Pupils will explore engineering knowledge and skill, including the use of engineering drawings. Accurate measurement and manufacture. The use of manufacturing aids such as jigs to aid batch manufacture. The concept of quality control by the use of go-no-go gauges. Develop further Product design: Looking at, development of ideas, sustainable use of materials and upcycling possibilities. Investigation of what can be used for a lamp head; produced from virgin materials or repurpose an existing product. Designing for the needs of the market by adapting a standard design. Accurate production drawings</p>	<p>Unit 9.4: Day of the Dead automaton: Mechanisms and industrial manufacture</p> <p>Exploration of how products can influence or reflect emotion, with a focus on the symbolism of the Day of the Dead (Día de Muertos). Pupils will produce an automaton which incorporating Day of the Dead symbolism using the knowledge of mechanisms and motion. Pupils will learn about how an input motion can be converted into a different form of output motion via the use of a mechanisms. Introduce the idea of kits, similar to flat pack furniture. Including the use of manufacturing tolerances and designing within constraints to ensure the product is fit for purpose.</p>	<p>Food and Nutrition</p> <p>Please see the link on the website for the KS3 Food and Nutrition provision.</p>