

Design Technology & Engineering

The Design Technology & Engineering Department of St Thomas More Catholic School aims to develop a love of Engineering in all pupils. We aim for all students to develop a strong understanding and apply the fundamental principles and concepts of Design Technology & Engineering; to develop communication, teamwork, and practical and problem solving skills that can be applied to real-life contexts and work situations. Students will think creatively, innovatively, analytically, logically and critically. We aim to develop strong technical accuracy and a reflective and autonomous approach in all of our students to enable them to reach their potential.

Key Stage 3 and 4

The Engineering Design Department curriculum has been built around the following key concepts that students need to grasp:

All products are designed with a function and aesthetic considerations. Pupils will take this into consideration when designing.	The products we use can affect our lives, the lives of those around us and the environment.	Materials have different properties and these influence how they are selected and used.	The vast array of different manufacturing methods available in school and industry. Students develop their making skills.
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Overall, by the end of Key Stage 3, pupils should be able to communicate their design ideas using a range of different methods, understand a range of different materials and be able to select appropriate ones based on their properties. They should be confident using a range of tools and equipment, including CAD/CAM to create a variety of products. They should also have a developing awareness of how products we use affects the environment and how a range of factors can influence designs.

	Carousel 1	Carousel 2
Year 7	Biplane/Mechanical Toy	Biplane/Mechanical Toy
Year 8	Copper Tea Light/Nightlight	Copper Tea Light/Nightlight
Year 9	Iconic Designer Clock	Iconic Designer Clock

Key Stage 4

Having developed their knowledge of the key concepts throughout Key Stage 3, the aim of Key Stage 4 is to ensure that students are able to apply their understanding of these concepts to allow them to successfully undertake either Product Design or Engineering courses.

To understand and apply the fundamental principles and concepts of Engineering Manufacture.	To develop learning and valuable practical skills in engineering manufacture that are highly sought after in the workplace, developing an awareness of	To develop a deep understanding of the subject throughout this learning.	To develop knowledge of the types of drawing used in engineering to communicate designs and CAD modelling methods.
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	commercial design and manufacturing processes.		
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Students studying Product Design or Engineering Manufacture are able to apply and extend their understanding of these concepts to allow them to become confident designers, analysing and evaluating a range of factors that influence design, plan out and make prototypes whilst developing an awareness of commercial design and manufacture. Sustainability is an important factor throughout this learning.

The table below shows you the topics pupils will study throughout Key Stage 4:

AQA Product Design

	Term 1	Term 2	Term 3
Year 10	Basic graphic communication skills. 3D design project Theory work	Iconic designer coasters Passive Speaker Theory work	Start NEA Theory
Year 11	NEA Theory	NEA Theory Revision of topics	Revision of topics

Cambridge National in Engineering Manufacture

	Module 1	Module 2	Module 3
Year 11	R015/: Manufacturing a one-off product. NEA Assessment R014: Principles of engineering manufacture	R014: Principles of engineering manufacture. Engineering skills/Practical Exam practice	R014: Principles of engineering manufacture. Exam skills/revision.

R015/16 will be rotated depending on year

Key Stage 5

AQA Product Design

	Term 1	Term 2	Term 3
Year 12	Furniture project Light project Technical principles Designing & Making principles	Charity jewellery project Technical principles Designing & Making principles	NEA Technical principles & Designing & Making principles
Year 13	NEA	NEA	Revision - Paper 1 & 2

	Technical principles. Designing & Making principles	Revision - Paper1 & 2 Technical principles. Designing & Making principles	
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AAQ Engineering

Students studying Engineering extended certificate at Key Stage 5 will build on the knowledge, understanding and skills established at Key stage 4, developing their ability to apply and integrate the fundamental principles and concepts of Engineering Manufacture, practical skills that can be applied to real-life contexts with depth and breadth. Success at this Key Stage is led by a critical understanding of the procedural concept below:

The table below shows you the topics pupils will study throughout Key Stage 5:

	Term 1	Term 2	Term 3
Year 12	Engineering Principles. Engineering Applications	Engineering Principles. Engineering Applications	Engineering Project Engineering Applications
Year 13	Engineering Design Engineering Principles Engineering Project	Engineering Design Engineering Project	Engineering Design Engineering Project