



Thomas Mills
High School & Sixth Form

CURRICULUM OVERVIEW: Design and Technology – Resistant Materials

“The best way to predict the future is to design it” - Buckminster Fuller

At Thomas Mills High School and Sixth Form we teach the Edexcel GCSE Design and Technology course, including the Timbers specialism. The course is structured to develop pupils' creativity, problem-solving, and technical knowledge. The key aims of the course are:

1. Creative Problem Solving - Pupils learn how to come up with ideas and design solutions to real-world problems, thinking about what people need and want.
2. Practical Skills - They get hands-on experience using tools and machines (like saws, drills, and even laser cutters or 3D printers) to build their designs.
3. Understanding Materials - They explore the properties of different types of wood and other materials—learning which are best for different jobs and why.
4. Thinking About the Bigger Picture - Pupils consider how their designs affect the environment, society, and people's lives. They learn to make responsible and sustainable choices.
5. Using Technology - They use computer-aided design (CAD) software to bring their ideas to life digitally before making them physically.
6. Evaluating and Improving - They test their ideas, get feedback, and learn how to improve their designs—just like real designers and engineers do.

The course is assessed as 50% written exam paper (1hr 45mins) where pupils are tested on their knowledge of materials, design, and making. The other 50% comprises of their Project which is a design and make task based on a real challenge set by the exam board.

Our aim for Y10 is to build further on the practical work skills that we have been developing in Year 9 Resistant Materials, this will be achieved through mini projects throughout the year. The mini projects also focus getting the pupils ready for their NEA coursework. We also teach the core theory of the course. In the June of Y10 the exam board release the themes for the pupils NEA coursework which we start straight away, this is worth 50% of their final grade and will be completed before easter of Year 11.

Year 10



| Term | Topic | Knowledge and Skills | Useful Links |
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| 1 | <p>Design and make Mobile phone holder</p> <p>Theory Unit 1 - Core</p> | <p>Knowledge: The first term of Year 10 shifts the theory focus from the 'timbers' specialism we were studying in Year 9 to the "core" content we will cover the following topics: New and Emerging technologies Energy generation and storage Modern and smart materials, composite materials and technical textiles Mechanical devices We will also further develop design presentation skills through a mini project where we research and develop a solution for a mobile phone holder. This project helps to develop skills that will be used in the NEA coursework later in the year.</p> <p>Skills: During this term pupils will refine the following skills: Working with materials – understanding the working properties and limitations of different materials Sketching – To be able to present design ideas to a high standard CAD – To refine CAD skills and be able to use <i>Sketchup for Web</i> to create dimensionally accurate designs manufacture – To be able to produce a high quality product that uses the skills learnt from Year 9. The phone holder should be dimensionally accuracy and have a finish that will protect and enhance the aesthetic appearance of the product.</p> | <p>Exam board and course information https://qualifications.pearson.com/en/qualifications/edexcel-gcses/design-and-technology-9-1-from-2017.html</p> <p>Seneca https://senecalearning.com/en-GB/</p> <p>Sketchup for web https://www.sketchup.com/en/products/sketchup-for-web?srltid=AfmBOopbNhEARPmhm9vhTuepl-wMG1QTqJZ0G4uhPYbSYtIR4VwfbYLw</p> <p>BBC Bitesize – Edexcel core https://www.bbc.co.uk/bitesize/examspecs/zb6h92p</p> |
| Assessments | | <p>There are four core assessments this term. One is an online core theory assessed through the Seneca learning platform. The second is the research, design and development and evaluation of their mobile phone holder, this will be a mixture of hand sketches and computer-based work. The third assessment is of the practical task, mobile phone holder. The final assessment this term will be a formal test paper using past paper questions.</p> | |



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| | | <p>Autumn 1: Online assessment using Seneca – Core knowledge Autumn 2: NEA project work – Research and design paperwork for the mobile phone holder project Autumn 3: Practical work – Mobile phone holder Autumn 4: Written assessment – Y10 Autumn assessment (exam style questions)</p> |
| 2 | <p>Design and make Candle holder</p> <p>Theory Unit 1 - Core</p> | <p>Knowledge: During this term we complete the last mini project before the final NEA coursework starts. We will be refining the research and development stages of the design process. The “core” theory continues this term focusing on the following sections: Papers and Boards Polymers Textiles Contexts that inform design decisions Environmental, social and economic challenges We will also further develop our understanding of materials and processes through the manufacture of a candle holder.</p> <p>Skills: This term focusing on the following skills: Research – be able perform research and present findings in the form of product analysis and inspiration boards. Modelling – To be able to produce card models to develop a final design. Drawing – To be able to present accurate working drawings with dimensions. Manufacture – To be able to shape and join metals to create a candle holder.</p> |
| | Assessments | <p>There are four core assessments this term. One is an online core knowledge assessed through the Seneca learning platform. The second is the design ideas and development of the candle holder (paperwork). The third assessment is of the practical task, Candle holder (practical work). The final assessment is the Year 10 spring assessment.</p> |



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| | | <p>Spring 1: Seneca Knowledge assessment – Core knowledge tests Spring 2: Design portfolio – Design and development of Candle holder using card models Spring 3: Practical work – Manufacture of Candle holder Spring 4: Trial exam – Spring assessment using past paper questions</p> | |
| <p>3</p> | <p>Design and make Start of NEA coursework section 1.1</p> <p>Theory Unit 1- core</p> | <p>Knowledge: This term we start the NEA coursework. The design themes are released on the 1st June. We also conclude the “core” theory focusing on the following topics Design strategies Developing and communicating design ideas. Pupils will complete the following parts of their coursework Investigation into NEA contexts Choose context and link a client to it. Product analysis Mood board Research into materials and tools available</p> <p>Skills: Investigate – Pupils will investigate the design themes and choose one for their project, they will present their investigations in their design portfolio. Research – Pupils will research existing products that are related to their problem and carry out a product analysis</p> | <p>Exam board and course information https://qualifications.pearson.com/en/qualifications/edexcel-gcses/design-and-technology-9-1-from-2017.html</p> <p>Seneca https://senecalearning.com/en-GB/</p> <p>BBC Bitesize – Edexcel core https://www.bbc.co.uk/bitesize/examspecs/zb6h92p</p> <p>BBC Bitesize – NEA help https://www.bbc.co.uk/bitesize/guides/zmshsrd/revision/1</p> <p>NEA help guide on Teams in the files section.</p> |
| <p>Assessment</p> | | <p>There are four core assessments this term. One is an online core knowledge assessed through the Seneca learning platform. The second is a trial exam with past paper questions. The other two assessments are first couple of sections of the NEA coursework; this takes the form of a computer-based portfolio.</p> <p>Summer 1: Online core assessment using Seneca</p> | |



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| | <p>Summer 2: Trial Exam on all theory content</p> <p>Summer 3: NEA coursework section 1.1 Investigation of design contexts</p> <p>Summer 4: NEA coursework section 1.1 Research in existing products, tools and materials available</p> |
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