

CURRICULUM SUBJECT: TECHNOLOGY

SUBJECT CONTACT: M ZULKARNAIN

“Enjoy failure and learn from it. You can never learn from success.” – James Dyson

CURRICULUM INTENT

Why is it important that pupils at Vale of York study Technology?

Understanding and immersing themselves in Technology is important for students' future paths. In our lessons Students will gain a better understanding that Technology is all around us and that problem solving starts with research, design and make/model.

Students will learn a lot of transferable skills from analytical skills, research skills to team working skills. Due to the versatility of Technology, students will find career paths within their community or further afield.

York is very fortunate to be a leading city in the UK for STEM, being home to York Science Park, Science City York , the National STEM Centre, and the National Science Learning Centre. This provides an abundance of additional opportunities for pupils with an active interest in this area of the curriculum.

CURRICULUM STATEMENT

At KS3: To create a real sense of achievement by allowing students to explore and take responsibility for their own learning. Students will design and make in a real life context and make products they can be proud of.

At KS4: Cambridge National Engineering Design deepens critical thinking and passion to design and make in a real life context. It is an inspiring, rigorous and practical subject which prepares all young people to live and work in the designed and made world.

CURRICULUM SEQUENCE

Key Stage 3:

	Year 7	Year 8	Year 9
Curriculum time		<i>2 hour per fortnight</i>	
Curriculum framework	<i>National Curriculum</i>	<i>National Curriculum</i>	<i>National Curriculum</i>
Personal attributes evolved that support learning	<i>Independent study through homework and project work</i> <i>Resilience - Try, try and try again attitude</i> <i>Team work -sharing resources and helping each other</i> <i>Decision Making - judging information and ideas from the world around you</i> <i>Confidence - it's okay to get it wrong attitude</i>		
Disciplinary Literacy	<i>In KS3 Technology, literacy skills are integrated into lessons and activities as a way of enhancing students' understanding of the subject. For example, be taught how to write a sequence of making or annotate design ideas</i> <i>Students are also taught subject specific vocabulary and how to use it accurately in speech and written language. This involves the use of strategies such as skimming, scanning, and close reading.</i> <i>Overall, the goal of teaching literacy in KS3 Technology is to help students develop the skills they need to critically analyse and communicate Technology</i>		

	<i>based ideas and information terminology</i>
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KS3 Curriculum plan - Content covered for End Point 1: February Year 7

Unit title	What is the key knowledge/understanding covered	Which key subject skills will be developed
<i>Block character made from softwood and embellished with textiles.</i>	<i>Understand the difference between softwoods and hardwoods Understand how materials be combined to enhance products</i>	<i>Sketching in 2d, Rendering, Marking out and measure on wood Follow a plan of manufacture Cutting wood safely Drilling holes safely using a pillar drill Preparing the surface safely using a vertical sander Applying acrylic paint Use of PVA as an adhesive</i>
<i>Textiles organiser (part1)</i>	<i>Introduction to types of textiles Introduction to methods of embellishment</i>	<i>Mark out and measure on textiles Safely cut textiles Use a variety of stitches for surface decoration and construction Evaluate a design</i>

KS3 Curriculum plan - Content covered for End Point 2: June Year 7

Unit title	Key knowledge covered	Subject skills developed
<i>Textiles organiser (part 2)</i>	<i>Health and Safety in a textiles room How to thread a sewing machine Types of settings on the iron when dealing with heat and fabric</i>	<i>Apply dye safely to change the colour of fabric Use the sewing machine safely Use an iron safely</i>
<i>CAD CAM cable tidy with built in LED light</i>	<i>Introduction into CAD/CAM software- Techsoft 2D design Working with Polymers and basic circuit boards Design realisation using laser cutter</i>	<i>Sketch in 3D simple shapes Apply rendering to show plastic as a texture Model in card simple designs Use a CAD package to draw 2D shapes</i>

		<p><i>Use the laser cutter safely Solder together a simple electronic circuit Use wet and dry on acrylic</i></p>
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KS3 Curriculum plan - Content covered for End Point 3: February Year 8

Unit title	Key knowledge covered	Subject skills developed
<i>Design movement influenced pizza cutter</i>	<i>Design movements from 1850 to the present day Anthropometrics Ergonomics</i>	<i>Drawing in 2D and 3D multi material designs Marking out and cutting metal Using templates Model in multi materials (more resistant) Using permanent and non-permanent fastenings (nuts, bolts, rivets)</i>
<i>3D Art sculpture (part 1)</i>	<i>How 3D items are created from flat pieces of fabric Research into Art Design movements Introducing how to create workable templates</i>	<i>Creation of a pattern Marking out using patterns onto fabric Adding a seam allowance Revisiting hand stitches from Year 7</i>

KS3 Curriculum plan - Content covered for End Point 4: June Year 8

Unit title	Key knowledge covered	Subject skills developed
<i>3D Art sculpture (part 2)</i>	<i>Improve design realisation Improve accuracy in working with fabrics Increase accuracy when working with tools and equipment</i>	<i>Using the sewing machine independently Adapting the settings on the sewing machine as required</i>
<i>STEM challenges in structures, mechanisms and electronics</i>	<i>6R's (rethink, repair, reduce, refuse, recycle and reuse) Smart and modern materials Mechanical, pneumatic and electronic systems Embedded electronic systems Adapt designs for real life problems</i>	<i>Soldering more complex circuits Assemble pulleys and gears to change direction and increase or decrease speed Model and create frame structures and shell structures Program embedded circuits (BBC Microbit and Crumble)</i>

KS3 Curriculum plan - Content covered for End Point 5: February Year 9

Unit title	Key knowledge covered	Subject skills developed
<i>Environmental game, using 3D CAD CAM</i>	<i>Expand on CAD/CAM designing Application of research to own designs</i>	<i>Drawing in 2D and 3D multi material designs Marking out and cutting different materials Using templates</i>
<i>Personal pennant (part 1)</i>	<i>Completed Primary and Secondary research Independent work with Textiles materials Evaluation against customer specification</i>	<i>Drawing in 2D and 3D multi material designs Marking out and cutting different materials Using templates Creative enhancement techniques</i>

KS3 Curriculum plan - Content covered for End Point 6: June Year 9

Unit title	Key knowledge covered	Subject skills developed
<i>Personal pennant (part 2)</i>	<i>Completed Primary and Secondary research Independent work with Textiles materials Evaluation against customer specification</i>	<i>Drawing in 2D and 3D multi material designs Marking out and cutting different materials Using templates Creative enhancement techniques</i>
<i>A mechanic marvel</i>	<i>How to successfully complete primary and secondary research Product analysis Product disassembly as part of research</i>	<i>Drawing in 2D and 3D multi material designs Marking out and cutting different materials Using templates Creative enhancement techniques</i>

Key Stage 4:

	Year 10	Year 11
Curriculum time	<i>5 hours over two weeks</i>	<i>5 hours over two weeks</i>
Curriculum framework	<i>OCR- Cambridge National</i>	

	<p>Two NEA- one of which is a mandatory unit, that are 60% of the overall grade Exam 1h15 40% of overall grade</p> <p>Cambridge National in Design Engineering</p> <p>RO38 Principles of engineering <i>This unit covers the different design strategies and where they are used, as well as the stages that are involved in iterative design.</i> OCR set and marked 70 marks (40%) 1h15min written exam</p> <p>RO39 Communicating designs <i>This unit covers techniques in sketching and students gain industrial skill in engineering drawing</i> NEA- centre assessed 60 marks (30%)</p> <p>RO40 Design, evaluation and modelling <i>This unit covers how designers can quickly create and test models to develop a prototype of a design.</i> NEA- centre assessed 60 marks (30%)</p> <p>Cambridge National in Engineering Manufacture</p> <p>RO14 Principles of engineering manufacture <i>This unit covers the different types of manufacturing processes, the materials that can be used to manufacture products using these processes, and the factors to be considered when determining the manufacturing requirements of an engineered product</i> OCR set and marked 70 marks (40%) 1h15min written exam</p> <p>RO15 Manufacturing a one-off product <i>In this unit students identify the information required to make a product, plan the production of a product and carry out risk assessment for the processes, tools and equipment needed to produce a product in small quantities.</i> NEA- centre assessed 60 marks (30%)</p> <p>RO16 Manufacturing in quantity <i>In this unit students gain an understanding of how to manufacture and use simple jigs and templates to support manufacturing in volume. By using CAD software, students will learn about the information needed to facilitate manufacture, and apply this in order to program Computer Numerical Control (CNC) equipment.</i> NEA- centre assessed 60 marks (30%)</p>	
Core knowledge & understanding covered	Improve precision when working with tools and equipment June- start NEA	Complete first NEA and start second NEA exam

Subject specific skills	<p><i>Working safely with specific tools and equipment</i></p> <p><i>Research skills</i></p> <p><i>Analytical skills</i></p> <p><i>Project management</i></p> <p><i>Time management</i></p>
Personal attributes evolved that support learning	<p><i>Independent study through homework and project work</i></p> <p><i>Resilience - Try, try and try again attitude</i></p> <p><i>Team work -sharing resources and helping each other</i></p> <p><i>Decision Making - judging information and ideas from the world around you</i></p> <p><i>Confidence - it's okay to get it wrong attitude</i></p>

Course specification:

[Cambridge Nationals Engineering Design](#)

[Cambridge Nationals Engineering Manufacture](#)

CURRICULUM OPPORTUNITIES

Key stage 3:

	Year 7	Year 8	Year 9
Within the formal curriculum	<p><i>Students are introduced to Design Technology through a range of projects using a variety of materials. Lessons are taught in mixed ability classes and will focus on theory of materials and processes and focused practical tasks.</i></p>		
Links to other curriculum areas	<p><i>Measuring and orthographic drawing is taught in Technology and Mathematics. Technology uses the same methods and language as Mathematics to ensure students are able to see the link between the two areas.</i> <i>Sustainability is a key topic within Technology that is also covered in Geography</i></p>		
Preparation for adult life	<p><i>Industrial processes are always referenced and pupils are shown how everyday products are manufactured in different scales of production and by different industrial processes. Sustainability and the role of a designer is also stressed as environmental issues are a hot topic. Students design and make products that can be put to practical use. Students are reminded, constantly, of the need to produce sustainable products and what the role of a designer is in our battle to reduce the carbon emissions that are contributing to global warming. Students have got a wealth of courses in post16. Apprenticeships in construction are currently delivered through Yok College. Other course in post 16 range from A-level Graphics, Design Technology to Electronics to name a few</i></p>		

CURRICULUM IMPLEMENTATION

As an Academy we have a range of clear standards and expectations of our pupils however each subject area has its own individual practices and habits that ensure that it can function to its optimum.

Curriculum delivery:

In KS3, students are introduced to Technology through a range of projects using a variety of materials. Lessons are taught in mixed ability classes and will focus on theory of materials and processes, focused practical tasks leading to more open ended design challenges.

KS4 Technology offers a range of subjects for students to choose from. Cambridge National Engineering builds upon learnt knowledge in KS3 and will further deepen their understanding and application of Technology in a wider world context. KS4 Technology (Cambridge National Engineering Design.Manufacture) is assessed through portfolio work and exam testing.

Homework:

	Frequency	Expected time to complete	Completion notes and handing in	What to do if stuck
7	once per fortnight	Up to 30 min	<i>Google classroom based. Homework is usually based around evaluation, additional research or a manufacturing diary.</i>	<i>Ask the classroom teacher or homework club</i>
8				
9				
10	weekly	Up to 60 min	<i>Homework is based around exam questions, revision techniques or manufacturing diary.</i>	<i>Use the e-learning book Use the revision book that is available through parentpay Ask the teacher or P6</i>
11	weekly	Up to 60 min	<i>Ongoing revision</i>	

SUPPORTING YOUR CHILD

	Resources to support your child	Relevance - How it helps
Key Stage 3	<i>DT- measuring exercises, free hand sketching, modelling on card, repairing items rather than throwing away.</i>	<i>Help with organisation of child To improve technical skills for practical lessons.</i>
Exam courses	<i>Engineering- Revision guide, Focus-e-learning app https://www.focuseducational.com/login-to-focus-elearning/</i>	<i>To help with ongoing revision</i>

Link above

<https://www.focuseducational.com/login-to-focus-elearning/>

WIDER INTEREST

CAD program for designing if you would like to design create like a professional

<https://www.onshape.com/en/>

<https://www.sketchup.com/>

Website for York Society of Engineering

<https://www.yorksocietyofengineers.org/>