Nether Stowe School
The Design and Technology Curriculum
Curriculum intent: our aims and values

Department Vision - Explore- Create- Evaluate

Creativity should be at the forefront of Design technology, "Creativity is intelligence having fun" (Albert Einstein) As quoted in the national curriculum for DT, it is important to use creativity and imagination to put this into real life context. Students need to be able to solve real life problems in a variety of contexts considering the needs of themselves as well as others and the developing world around them. Design technology is important for developing students to be able to take risks, think collaboratively and work to a brief. Thinking independently will enable each student to be responsible for the direction of their learning whilst being facilitated by their teacher through the delivery of projects within the department. The only boundary to making an impact in the future is our 'imagination' and our ability to 'engineer' the solutions that could affect peoples' lives. The design ideas are the first step, putting these into context and developing technical abilities to create new inventions is vital. Without having DT we wouldn't have some of the great British inventors like Dyson with his innovative ideas and having the ability to take risks and think about the needs of his consumers. The Faculty will be truly cross-curricular and will use aspects of many subjects to aid the students when developing innovative ideas and solving problems individually or as a team.

Our objectives are to:

• Offer an all-through experience from key stage 3 to key stage 4, enabling each student to be more aware of the technological world in which we live and to see year-on- year progress throughout the school.

• Develop strong links with industry as well as strengthening our partnership within the ATLP.

• Create products or systems which solve real-life problems in a truly inspirational manner.

• Develop a wide variety of creative and technical skills in computing, manufacturing, designing, and problem-solving.

STEM

DT has great links with other subjects and in order for students to get the best out of technology they need to ensure the cross curricular links with Science and Maths and Engineering. This helps support students and raise the profile of the subject. Within the department, this will become more of a stronger link through outside speakers and work within school.

Environmental responsibility

As well as looking at the creating side of DT, it is important to be mindful of the environmental impact of materials and products. This will form part of the designing and evaluation process, which needs to be embedded from KS3 upwards.

Implementation

At KS3 we teach an integrated curriculum, initially equipping our students with the necessary knowledge and skills in Design Technology, Food and Computing followed by teaching through projects that utilise the skills that they have acquired. These are short resource-based projects which are completed on an individual basis. The KS3 rotation allows pupils to gain a breadth of skills within the faculty, giving them a good taste of the DT Curriculum.

Year 7
In year 7, pupils have come from schools that may have delivered a wider or limited Design and Technology curriculum with varying content compared to others. Pupils arrive having different starting points in relation to key content covered, as well as the understanding relating to the DT key concepts and skills. The scheme of work for Year 7 aims to introduce students to a range of key concepts within DT across a range of material disciplines, allowing pupils to explore and develop their understanding of Design and Technology through content covered in the KS3 DT National Curriculum. In The RM side of DT, the LED light project allows pupils to investigate the design brief and produce detailed design ideas to enable them to work from their plans to produce Ideas on CAD for the LED Light based on a mythical creature. Students will also learn about the key health and safety points which they need to follow when using machinery, hand tools and soldering irons. In textiles pupils also follow

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the iterative design process but with a focus on the health and safety of the textiles workroom and when using the textiles equipment. Students will then be introduced to the basics of hand sewing learning how to add buttons, sequins and beads for decoration as well as attempting more detailed hand embroidery to produce a fleece hat. In ICT pupils will explore how to program a small circuit board to make it do a range of operations which will then be implemented to help create and build a small robot that they will program in order to carry out day to day tasks.

Year 8

In Food, the scheme of work follows the National Curriculum for Health and Nutrition by focusing on key concepts throughout the course. Students embed a deeper understanding of Food preparation and nutrition by focusing mainly on Health and Safety, Food Hygiene, Diet, Cooking Skills and Evaluating methods. Information is covered in relation to government guidelines to help students see the purpose of the subject and consider how to make healthy food choices for themselves. Pupils will have one theory lesson, demonstration and practical lesson over every two weeks. The Practical element looks a range of dishes which are predominantly savoury based, along with how pupils can use leftover ingredients to make a different dish. Pupils also look at designing dishes for people with a dietary requirement and how different cultures, beliefs and religions can affect their final outcomes. In textiles, pupils will start by dissecting a design brief linked to the WWF charity and make a choice on the product they would like to manufacture. They will then practice a variety of different decorative techniques including hand sewing, machine sewing and appliqué. They will then learn how to produce a tote bag or a cushion cover. Within the ICT lessons pupils will learn about animation and will develop their own flash animation from designing to create an electronic version of their animation. Students will also learn what a flipbook is, before designing their own flipbook and then creating it. This will develop their animation skills by learning what a story board is and how animation has developed over the years.

Year 9

In year 9 DT our students embark on more ambitious products following an iterative design process. Each student must identify a selected design era and provide a solution through the design process to produce a clock that has strong links to past designers and design eras. This is a great opportunity for pupils to be creative while learning about what is expected in the GCSE NEA. Pupils study a design era which they select themselves to help inspire their own creative clock designs, they also produce a fact file which outlines specific designers and their work. This project allows pupils to be creative and to use a range of materials and processes which they have not experienced in previous projects. The textiles element of the course builds on the year 8 project where pupils learn how to insert zips in order to produce a pencil case. Pupils will start by researching existing pencil cases analysing what goes into the design. They will also research existing fastenings by refining their hand sewing skills by attaching them to fabrics so they can evaluate their usefulness for a pencil case. In year 9 ICT, pupils also use their skills from year 8 to be working to a project brief in order to solve a problem they will be asked to create an animation on healthy eating. This will be achieved by reviewing and discussing different types of animation, developing ideas, explaining user requirements and developing a possible design, creating an animation based on requirements and lasty developing a series of test to the animation.

Year 10

In year 10 we cover both theory and practical unit choices from the AQA Design Technology GCSE. We adopt a creative curriculum approach where students are given regular opportunities to apply and develop their designing and making skills to practical projects, along with exam style questions to test the core technical principles which are taught through theory-based lessons. Theory based sessions are predominantly investigation based, allowing pupils to test and ask questions that embeds deeper learning and understanding. The DT curriculum can be refined to meet the needs of the pupils, by offering a range of assessment opportunities. The DNA tasks are based on examination style questions to allow students to experience the style of question and answer that they would see in their end of year examination. This low stakes method of testing is often used as retrieval practice and to assess the impact of classroom and home learning.

Year 11

Pupils produce a functioning prototype along with supporting coursework to meet a task provided by AQA. Theory based sessions are predominantly investigation based, allowing pupils to test and ask questions that embeds deeper learning and understanding. The DT curriculum can be refined to meet the needs of the pupils, by offering a range of assessment opportunities. The DNA tasks are based on examination style questions to allow students to experience the style of question and answer that they would see in their end of year examination. This low stakes method of testing is often used as retrieval practice and to assess the impact of classroom and home learning.

Pupils also sit a trial examination towards the end of Y11 where their knowledge of the DT principles is applied to a range of questions. Class teachers then analyse the responses to the question papers and adapt the theory-based lessons to include elements of re-teaching in order for pupils to revisit areas of weakness.

Impact
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Assessment takes place on a regular basis across the department in relation to a whole school policy of progress checks and milestones. Progress checks assess learning which has recently been undertaken within the classroom, this includes theory and practical work. Milestones assess both new learning and prior learning so that teachers and pupils know whether what has been taught has been remembered, in KS4 DT this is usually done as an exam style question. Following the completion of progress checks and milestones, pupils will upgrade their work in green pen allowing them to act on the feedback provided by their teachers. Common misconceptions are also revisited as a class at this point. Assessment evidence also allows teachers to decide on whether or not any key content needs to be covered again in class, perhaps using a different approach to ensure that all pupils have understood the key information or concept which has been delivered.

'Do Now' activities are often used as retrieval practice and to assess the impact of home learning. In Design and Technology DNAs and low stakes testing is used to embed knowledge recall. The stretch will usually be based on concepts taught in previous topics or a few lessons previously. The idea is to build up students long term memory of key facts needed support learning. If it is evident that common knowledge has not been retained, the teacher can then arrange a time to re-deliver the information in a different way so that this gap in key content can be addressed.

'Red Zone' activities are used regularly across all year groups in order to give the pupils the opportunity to complete independent practice and this also gives teachers the opportunity to assess whether or not the learning over the most recent lessons has had the desired impact with the class. Teachers are encouraged to reflect on the work produced by students during Red Zone tasks in order to potentially make changes to future lessons, which are delivered to further increase the impact of the learning taking place.

Within lessons, teachers regularly use questioning in order to assess the impact of the learning upon the class. This allows another opportunity for pupils to check the understanding of pupils and to allow lessons to be reflected on or altered in the future to further improve the learning experience.

Peer and self-assessment is used following red zones so students get the opportunity to independently reflect on their progress.

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KS3 Curriculum Overview			
Rotation	**Year 7 (3hrs)**	**Year 8 (3hrs)**	**Year 9 (3hrs)**
Product Design Resistant Materials & Food	**LED Lamp** **L.O: Understand the DT design and make process along with demonstrating how to work safely with a range of tools to create a working LED lamp.** Students will create imaginative design drawings based on mythical creatures and so discover the need for a standard form of communication in Design & Technology. They will become acquainted with electrical systems and their components by producing a simple LED circuit for their lamp. They will also start to investigate how to use CAD by developing their idea on 2D Design, Finally, students will have practical lessons where they manufacture their design.	**Food Basics** **L.O: To know how to safely and hygienically prepare and cook a range of predominantly savoury dishes.** Students will understand and apply a range of elements from the food preparation nutrition National Curriculum focusing mainly on Health and Safety, Food Hygiene, Diet, Cooking Skills and Evaluating methods. Pupil will Understand the need for a balanced healthy diet and the impact of deficiency and excess on the body. They will Produce a range of dishes using specialist tools and equipment, specialist techniques and evaluate nutritional references. Students will have experiences in a range of cooking techniques, selecting and preparing ingredients, using utensils and electrical equipment and applying heat in different ways.	**Clock Project** **L.O: Explore and apply the DT GCSE structure to produce a creative and individual clock design.** Students will apply elements of the Iterative Design process using both traditional and Computer Aided Design tools to design unique elements of a clock which they will produce using Computer Aided Design, Computer Aided Manufacture and workshop tools and equipment.
Textiles	**Fleece Hat** **L.O: Explore how to safely use a sewing machine to produce a fleece hat.** Students will be introduced to the basics of hand sewing learning how to add buttons, sequins and beads for decoration as well as attempting more detailed hand embroidery. All students will then sit their sewing machine driving license to demonstrate their ability to use the sewing machine independently. Students will then research and create their own initial ideas before manufacturing their hat.	**Cushion Covers or Tote Bag** **L.O: Investigate how to apply a range of decorative textile techniques to produce a final product** Pupils dissect a design brief linked to the WWF charity and make a choice on the product they would like to manufacture. They will then practice a variety of different decorative techniques including hand sewing, machine sewing and appliqué. Students will then research into tie dye looking at how different patterns are formed, practicing their tonal shading whilst drawing them. Finally, students will produce their own creative designs for their chosen product meeting the requirements of the design brief. Once designed students will then manufacture their final idea.	**Pencil Case Project** **L.O: Design, Create and Evaluate a pencil case by applying a range of textile skills.** Pupils research existing pencil cases analysing what goes into the design, along with researching existing fastenings by refining their hand sewing skill. Students create a client questionnaire and then use this feedback to create different design ideas. Their final idea is then manufactured using a range of textile-based skills.

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	Robot Chick	Flip Book Animation	Flash Animation Healthy Eating
ICT	**L.O: Investigate how to programme a robot in order to carry out a range of tasks.** Students will create and build a small robot that they will program in order to carry out day to day tasks. Pupils will learn how to make the robot play music, explain and show how to program motors to make them move, demonstrate how to combine code so that problems can be solved and develop code to move the robot around a track.	**L.O: Understand how to turn a storyboard into a flipbook animation.** Pupils will learn what flipbook is, design their own flipbook and then create it. This will develop their animation skills, pupils will do this by explaining what flipbook animation is and describe the advantages and disadvantages of flipbook animation. Pupils will then develop and create a storyboard to cover the main areas of their flipbook and finally create their storyboard into a flipbook format.	**L.O: Design and create a flash animation based on healthy eating.** Pupils will be working to a project brief in order to solve a problem they will be asked to create an animation on healthy eating. This will be achieved by the pupils reviewing and discussing different types of animation, by developing ideas. They will be able to explain user requirements and develop a possible design, based on creating an animation built on specific requirements.

KS4 Curriculum Overview			
Year 10 GCSE	**Component 1:** **Materials and their properties.** Metal project along with joining and casting in different metals.	**Component 2:** **Mechanical Devices** Mechanical toy project (Wood joints and cad element)	**Component 3:** **GCSE Mock mini NEA project** **Component 4:** **GCSE NEA project start NEA AO1 – Section A Identifying and investigating design possibilities**

Year 11 GCSE	**Component 1:**
	NEA AO1 – Section B Generating a design brief and specification
	
	NEA AO2 –Section C Generating design ideas
	       Section D Developing design ideas
	       Section E Realising design ideas
		Component 2:
		NEA AO2 – Section E Realising design ideas
		NEA A03 - Section F Analysing & evaluating
			Revision for the examination

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