



# TECHNOLOGY CURRICULUM MAP

**BIG IDEAS:** In **design and technology**, we aim to create opportunities for students to: Work independently and in teams to produce creative and innovative design solutions to real world problems. Apply knowledge and theory from DT and other related subjects (STEM) linking to the design and development of ideas. Develop practical skills working with a range of tools, equipment and machines and with a variety of materials. Use evaluation skills to critically assess their own work and that of others whilst considering the impact of these designs in the current world and the future.

In **food and nutrition**, we provide opportunities for students to: Work independently and in teams to develop an understanding of how ingredients work and why. Apply knowledge and theory from Food and other related subjects (STEM) linking to; nutrition and health, food science, food safety, food choice, food provenance and food preparation skills. Work independently to plan and demonstrate a wide range of sweet and savoury recipes, selecting and using a variety of suitable equipment safely and hygienically. Use evaluation skills to critically assess their own work and of others, considering; nutritional value, technical skills, sensory analysis and environmental impact.

Year 7 DT and Food	Year 7 teaches the foundation knowledge and skills needed within the subject, students complete three units in rotation. Homework in Year 7 is designed to extend the curriculum time of 3 hours a fortnight by allowing an opportunity to consider the wider world including careers, social, moral, cultural and environmental issues.		
	Made to Measure	Ideate	Food and Nutrition
	<p><b>Wedge it</b> To learn the properties of wood To learn to mark out and cut accurately To learn to use range of tools/machinery safely To produce an accurate scale drawing to communicate an idea <b>STEM team challenge</b> To develop team working skills To further develop practical skills by using tools and machinery independently To produce an accurate working outcome and test its capabilities To learn about structures and levers <b>Electronics</b> To learn the properties of a range of electronic components and combine them to make a functioning product. To understand that electronic systems consist of an INPUT, PROCESS and OUTPUT <b>Homework</b> Mechanical systems, Electronic systems, Careers in engineering</p>	<p><b>Pewter casting</b> To investigate the work of other designers. To learn the properties of man-made boards, metals and alloys. To gain confidence in using hand tools and machines to produce a metal product with a desirable finish. <b>Headphone wrap</b> To learn the properties of Polymers To develop creative ideas using the iterative process To gain confidence in using hand tools and machines to produce a plastic product with a desirable finish. <b>Homework</b></p> <ul style="list-style-type: none"> <li>• Sustainable design</li> <li>• Famous designers</li> <li>• Careers in design</li> </ul>	<p><b>Food Science</b> To develop independent practical cookery skills To understand the chemical changes that happen to food when prepared in different ways Practical cookery: fruit salad, pizza toast, macaroni cheese, jam tarts <b>Healthy eating</b> To develop an understanding of how to eat a healthy diet To identify healthy food items and create recipes in line with the Eatwell guide. Practical cookery: fruity muffins, pasta sauce, fruit crumble <b>Homework</b></p> <ul style="list-style-type: none"> <li>• Food in different cultures</li> <li>• Recipe costing</li> <li>• Careers in food</li> </ul>

<b>Year 8 DT and Food</b>	Year 8 focuses on creativity and application of skills and knowledge in a range of contexts, students complete three units in rotation. Homework in Year 8 is designed to extend the curriculum time of 3 hours a fortnight by allowing an opportunity to consider the wider world including careers, social, moral, cultural and environmental issues.		
	<b>Future Engineers</b>	<b>Innovate</b>	<b>Food and Nutrition</b>
	<p><b>USB Lamp</b> Embed knowledge and skills in working with polymers To learn about CAD/CAM (2D Design and Laser Cutter) To learn about product evolution and the design process To develop presentation techniques and explore creative strategies to produce a quality final product</p> <p><b>Homework</b></p> <ul style="list-style-type: none"> <li>• Sustainable energy</li> <li>• Designing for developing world</li> <li>• Careers in environmental design and architecture</li> </ul>	<p><b>Stand or store</b> To measure and cut out with precision a complex joint To independently develop creative and innovative ideas To objectively evaluate using technical knowledge Embed knowledge and skills in working with wood</p> <p><b>Homework</b></p> <ul style="list-style-type: none"> <li>• Product evolution</li> <li>• Inclusive design</li> <li>• Careers in the timber industry</li> </ul>	<p><b>Food Science</b> To understand how to conduct a food science investigation. To investigate the function of ingredients in a recipe. Practical cookery: bread roll, pizza, stir fry</p> <p><b>Food costs and waste</b> Develop the ability to plan, prepare, cook and adapt recipes to suit the user's requirements. Practical cookery: Bolognese, Spanish tortilla</p> <p><b>Food safety</b> Understand how to keep food safe; prevent foodborne illness Practical cookery, sausage rolls, chicken fajitas</p> <p><b>Homework</b> Special diets - religion, health and culture Food packaging Careers in the food industry</p>
<b>Wider Super Curriculum</b>	<p><b>Link to other subjects</b></p> <ul style="list-style-type: none"> <li>• <b>Science</b> - kinetic energy, friction, levers, electricity, components and circuits, extraction and refining of metals, extraction and refining of crude oil to produce plastics</li> <li>• <b>Maths</b> - measuring, averages</li> <li>• <b>Art</b> - design movements, famous designers</li> </ul> <p><b>Real world issues</b></p> <ul style="list-style-type: none"> <li>• Environment - managing natural resources, sustainable energy, built in obsolescence, impact of products at their end of life, pollution from energy, impacts of mining, recycling, impacts of plastic waste, reducing packaging</li> <li>• Collaborative working</li> </ul> <p><b>Careers</b></p> <ul style="list-style-type: none"> <li>• Year 8 careers lesson term 3, Careers links on Firefly subject page</li> </ul> <p><b>Super curricular</b></p> <ul style="list-style-type: none"> <li>• Design and make club</li> <li>• Enrichment week - wildlife shelter project</li> <li>• House competition - tower building/marble run</li> <li>• Firefly activities - super curricular links</li> </ul>		<p><b>Links to other subjects</b></p> <ul style="list-style-type: none"> <li>• <b>Science</b> - heat transfer methods, nutrition, acids &amp; alkalis, effects of heat and moisture on starches, microorganisms (yeast), fermentation, pathogenic bacteria.</li> <li>• <b>Maths</b> - weighing, measuring, timing, temperature, shape, volume, percentages, ratios, costing</li> <li>• <b>Geography</b> - staple diets, climate, food production and food miles</li> <li>• <b>PRE-</b> food culture and religion</li> </ul> <p><b>Real world issues</b></p> <ul style="list-style-type: none"> <li>• Life skills, food related disease prevention, food safety, hygiene, environmental impact of food production, sustainable diets</li> </ul> <p><b>Careers</b></p> <ul style="list-style-type: none"> <li>• Year 8 careers lesson term 3</li> <li>• Careers links on Firefly subject page</li> </ul> <p><b>Super curricular</b></p> <ul style="list-style-type: none"> <li>• Enrichment week Florence trip, international culinary skills</li> <li>• Firefly activities- super curricular links /extension recipes</li> </ul>

<b>KS4 DT</b>	Prepares students to participate confidently and successfully in an increasingly technological world. Students gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise. Students study core technical and designing and making principles, including a broad range of design processes, materials, techniques and equipment.		
<b>Year 9 DT</b>	<b>Photo Frame project</b> To name specific designers and design companies and use knowledge of these to influence design ideas. To name specific sheet materials and explain uses, production and comparisons to timbers. To produce products following a cutting list and formal drawing.	<b>Mood lamp</b> To investigate, analyse and develop a product specification to use in the design and development of products. To use the knowledge of electronic components (specific component names) and processes (including the use of microcontrollers) to explain how circuits add function to products.	<b>Eco Amp</b> To explain why timber is a sustainable material and how sustainability and social issues impact the design of products. To use and apply knowledge of production aids, material finishing techniques and formal drawing methods and link this knowledge to the design and manufacture of products in industry.
	<b>Theory</b> Designers & Design Movements; Materials: Timbers & Manufactured Boards; Electronics (sensors, inputs, outputs); Microcontrollers; Materials: polymers (acrylic and HIPS); Mechanical systems (cams, levers, linkages); Systems approach to designing Materials: metals & alloys; Sustainability; Social issues & ethics; Jigs, templates & batch production		
<b>Year 10 DT</b>	<b>Practise NEA</b> To prepare students to complete the design and development section of the NEA focusing on iterative design process. <ul style="list-style-type: none"> <li>● Mind Map / Mood board</li> <li>● Research (product analysis / ergonomics)</li> <li>● Specification</li> <li>● Design Ideas (free, focused on social issues for two other pages)</li> <li>● Modelling / prototyping quick</li> <li>● Analysis &amp; Evaluation throughout</li> </ul>	<b>Bird Box</b> To develop accuracy in measuring, marking out and cutting. To understand and be able to apply different jointing techniques. To use CAD/CAM to manufacture components. To combine different materials to produce a product. <ul style="list-style-type: none"> <li>● Measure and mark out accurately</li> <li>● Use different joining/forming processes</li> <li>● Work in a variety of materials</li> <li>● Use CAD/CAM to manufacture a component</li> <li>● Finish a product to a high standard</li> <li>● Produce an orthographic drawing</li> </ul>	<b>NEA (50% - theme released 1st June)</b> <b>Identifying and investigating design possibilities</b> To analyse contexts and briefs considering design possibilities and identifying possible investigations that can take place into products, clients and other research areas. To effectively use product analysis to evaluate existing products and use relevant primary and secondary research to produce design specifications and inform the design and development of products. <b>Producing a Design Brief and Specification</b> To use conclusions from investigations to develop design briefs and specifications which are justified and used for evaluation throughout the design process.
	<b>Theory:</b> Energy generation & storage: fossil fuels, renewable energy; Materials : textiles, paper and boards; Materials revision: polymers, metals and alloys, timber and manufactured boards; Industries; Production; Informing design decisions; People, culture & society; Enterprise Review content taught on systems approach to designing; Smart, modern & composite materials; Forces & stresses		

<p><b>Year 11 DT</b></p>	<p><b>NEA (50% - assessment deadline 7th May)</b></p> <p><b>Generating Design Ideas:</b> To explore design possibilities using a range of different techniques to demonstrate flair, innovation and originality which link to the brief and specification written. Through the design of products consideration should be given to the client, further research and feedback from others. Work should show individuality and also should be communicated effectively through good quality sketches, quick modelling and explain annotation.</p> <p><b>Developing Design Ideas:</b> Develop and refine initial ideas through the use of 2D/3D sketching, computer aided design and high-quality modelling. Through this process ideas should be refined and further developed considering ongoing research and the brief and specification set. Through the presentation of work, including annotation, a clear knowledge of why materials and components have been selected must be made. Through effective evaluation a final design solution must be presented including a formal drawing for manufacture, a written and justified manufacturing specification and a cutting list including materials and components required.</p> <p><b>Realising Design ideas:</b> Using knowledge of materials, components, tools and equipment to manufacture high quality prototypes that meet the aims of the brief and specification set. Through written records or verbal conversations explanations of how and why decisions were made during manufacture are clear and use correct terminology. Health and Safety is evident and is considered at all stages.</p> <p><b>Analysing and Evaluating:</b> Throughout the design process evaluation is used to inform design decisions and to develop ideas. Specific testing of the final product takes place. Final evaluations considering the design brief, specifications and third-party feedback are written and suggest improvements that could be made to the product as further development. Consideration of how the final product could be further adapted for commercial production is made with changes to materials, components and processes identified.</p>	<p><b>Exam (50%)</b> Revise theory content and practise exam questions</p> <ul style="list-style-type: none"> <li>• Core technical principles</li> <li>• Specialist technical principles</li> <li>• Designing and making principles</li> </ul>
	<p><b>Theory:</b> Specialist technical principles - extended knowledge of timbers &amp; manufactured boards; Revise - core technical principles and designing and making principles</p>	
<p><b>Wider Super Curriculum</b></p>	<p><b>Link to other subjects</b></p> <ul style="list-style-type: none"> <li>• <b>Maths</b> - measuring, averages</li> <li>• <b>Science</b> - kinetic energy, friction, levers, electricity, components and circuits, extraction and refining of metals, extraction and refining of crude oil to produce plastics</li> <li>• <b>Art</b> - design movements, famous designers</li> <li>• <b>Geography</b> - sustainability</li> <li>• <b>Business</b> - enterprise, crowdfunding</li> </ul>	<p><b>Real world issues</b> Environment - managing natural resources, sustainable energy, built in obsolescence, the impact of products at their end of life, pollution from energy, impacts of mining, recycling, impacts of plastic waste, reducing packaging</p> <p><b>Super curricular</b> NEA extra sessions, Revision and exam question extra sessions Enrichment week - wildlife shelter project, Firefly activities - super curricular links, House competition - tower building/marble run</p> <p><b>Careers:</b> Year 11 Careers lesson term 1, Careers links on Firefly subject page</p>

<b>KS4 Food and Nutrition</b>	Prepares students to independently, confidently and successfully demonstrate a range of high-level skills to produce demanding and challenging recipes. Students gain awareness and learn from wider influences on food preparation and nutrition including historical, social, cultural, environmental and economic factors. Students work creatively when designing and making for dietary needs, seasonality and cultural needs. Throughout the course students will make, investigate and apply technical and practical expertise. Students study the five key topics; nutrition and health, food science, food safety, food choice, food provenance and food preparation skills.			
<b>Year 9 Food and Nutrition</b>	<b>Food safety:</b> To develop an understanding of microorganisms and enzymes, signs of food spoilage, microorganisms in food production, bacterial contamination, buying and storing food, preparing, cooking and serving food.	<b>Food, nutrition and health:</b> To develop an understanding of; macronutrients, micronutrients, making informed choices for a varied and balanced diet, energy needs, how to carry out nutritional analysis, diet, nutrition and health.	<b>Food science</b> To develop an understanding of the cooking of food and heat transfer, selecting appropriate cooking methods, functional and chemical properties of food.	
<b>Year 10 Food and Nutrition</b>	<b>Food Provenance/security</b> To develop an understanding of food sources, food and the environment, sustainability of food, food processing and production, technical developments associated with better health and food products.	<b>Food choice</b> To develop an understanding of; factors affecting food choice, food choice relating to religion, culture, ethical and moral beliefs and medical conditions. Food labelling and marketing influences, British and international cuisines and sensory evaluation.	<b>Revision for written mock</b> <ul style="list-style-type: none"> <li>● nutrition and health</li> <li>● food science</li> <li>● food safety</li> <li>● food choice</li> <li>● food provenance/security</li> </ul> <b>Practise NEA 2</b> To prepare students for NEA 2 by using their knowledge, skills and understanding in relation to the planning, preparation, cooking, presentation of food and application of nutrition for a given task. Students will prepare, cook, and present a final menu of three dishes within 3 hours, planning in advance how this will be achieved.	
<b>Year 11 Food and Nutrition</b>	<b>NEA 1</b> (15% theme released 1st September) <b>Food investigation (30 marks)</b> Students' understanding of the working characteristics, functional and chemical properties of ingredients.	<b>NEA 2</b> (35% theme released 1st November) (Assessment deadline for both NEAs 7th May) <b>Food preparation assessment (70 marks):</b> Students' knowledge, skills and understanding in relation to the planning, preparation, cooking, presentation of food and application of nutrition related to the chosen task. Students prepare, cook and present a final menu of three dishes within a single period of no more than three hours, planning in advance how this will be achieved.		<b>Exam (50%)</b> Revise theory content and practise exam questions <ul style="list-style-type: none"> <li>● nutrition and health</li> <li>● food science</li> <li>● food safety</li> <li>● food choice</li> <li>● food provenance.</li> </ul>
<b>Wider Super Curriculum</b>	<b>Links to other subjects</b> <ul style="list-style-type: none"> <li>● <b>Science</b> - Pathogenic bacteria, heat transfer, catalysts, nutritional needs, macronutrients, micronutrients, planning a fair test, writing a hypothesis, medical conditions</li> <li>● <b>Maths</b> - Percentages, weighing and measuring, proportion, timing, temperature, shape, volume, ratios, costing</li> <li>● <b>Geography</b> - Food culture and impacts on food choice</li> <li>● <b>PRE</b> - cultural, ethical and moral beliefs</li> </ul>		<b>Real world issue</b> Life skills - planning and preparing nutritionally balanced meals, costing recipes, safe food preparation and storage, hygiene, diets for healthy living and to prevent disease <b>Super curricular:</b> NEA extra sessions, Revision and exam question extra sessions, Enrichment week - food activities, Florence trip Firefly activities - super curricular links <b>Careers:</b> Careers links on Firefly subject page	

<b>KS5 Product Design</b>	<p>A level Product Design strengthens learners' critical thinking and problem-solving skills within a creative environment, enabling them to develop and make prototypes/products that solve real-world problems, considering their own and others' needs, wants, aspirations and values. Learners to identify market needs and opportunities for new products, initiate and develop design solutions, and make and test prototypes/products. Learners acquire in depth subject knowledge in design and technology, including how a product can be developed through the stages of prototyping, realisation and commercial manufacture.</p>		
<b>Year 12 Product Design</b>	<p><b>Presentation skills, Modelling skills</b>  <b>Iterative design project</b>  <b>Team challenge</b></p> <ul style="list-style-type: none"> <li>• Develop basic and complex 2D and 3D communication skills including CAD/CAM.</li> <li>• Develop a design for a specific user group using the iterative design process.</li> <li>• Acquire in depth subject knowledge about factors a designer must consider and the resources available to them.</li> </ul> <p><b>Theory:</b> maths - scale, area, volume &amp; density, digital technology, polymers &amp; polymer processes, ergonomics/anthropometrics, sustainability, manufacturing systems marketing, launching a product legislation</p>	<p><b>Light upcycling project</b>  <b>Revision and preparation for paper 1: Principles of Product Design (26.7%)</b></p> <ul style="list-style-type: none"> <li>• Develop and make a prototype using the iterative design process.</li> <li>• Be open to taking design risks, showing innovation and enterprise whilst considering their role as responsible designers and citizens</li> <li>• Acquire and apply in depth subject knowledge about materials and processes used in industry.</li> </ul> <p><b>Theory:</b> maths - trigonometry, cost, discount, percentage profit, charts &amp; graphs, metals &amp; metal processes, timber &amp; manufactured boards, shaping &amp; machining wood, composite, smart &amp; modern materials textiles, quality assurance, standard forms, components</p>	<p><b>Key designers assignment</b>  <b>Product evolution essay</b>  <b>NEA: Iterative Design Project (50%)</b></p> <ul style="list-style-type: none"> <li>• Have a critical understanding of the wider influences on design and technology, including cultural, economic, environmental, historical and social factors.</li> <li>• Understand methods used to ensure structural stability.</li> <li>• Develop knowledge and experience of real world contexts for design and technological activity.</li> <li>• Identify market needs and opportunities for new products. Develop the capacity to think creatively, innovatively and critically through focused research and the exploration of design opportunities arising from the needs, wants and values of users and clients.</li> </ul> <p><b>Theory:</b> Structures, Product evolution Design movements and influential designers</p>
<b>Year 13 Product Design</b>	<p><b>NEA: Iterative Design Project (50%)</b>  <b>Preparation for paper 2: Problem Solving in Product Design (23.3%)</b></p> <ul style="list-style-type: none"> <li>• Develop prototypes that solve real-world problems, considering their own and others' needs.</li> <li>• Work collaboratively to develop and refine ideas, responding to feedback from users, peers and expert practitioners.</li> <li>• Develop critical thinking and problem-solving skills.</li> </ul> <p><b>Theory:</b> MATHS - speed distance &amp; time, FINISHES, ADHESIVES</p>	<p><b>NEA: Iterative Design Project (50%)</b>  <b>Preparation for paper 1: Principles of Product Design (26.7%)</b>  <b>REVISION: revision clock activities</b></p> <ul style="list-style-type: none"> <li>• Make informed design decisions through an in-depth understanding of the management and development of taking a design through to a prototype.</li> <li>• Work safely and skilfully to produce a high-quality prototype</li> <li>• Develop an in-depth knowledge and understanding of materials, components and processes.</li> </ul> <p><b>Theory:</b> MATHS- probability</p>	<p><b>NEA: Iterative Design Project (50%)</b>  <b>REVISION: revision clock activities</b>  <b>EXAM PREPARATION: Principles of Product Design (26.7%) and Problem Solving in Product Design (23.3%) past papers</b></p> <ul style="list-style-type: none"> <li>• Test, evaluate and review prototype and make informed suggestions for refinements.</li> <li>• Apply a strong core knowledge and understanding of principles in design and technology in order to make informed decisions in broader contexts.</li> <li>• Develop and use key design and technology terminology to communicate effectively in future education and employment</li> </ul>

<b>KS5 EPQ Artefact</b>	EPQ artefact requires learners to <b>independently</b> plan, research, develop and evaluate the production of an artefact.
<b>Year 12</b>	Learners begin by <b>identifying a brief</b> for their artefact and making a <b>project plan</b> . They will then <b>research potential materials, information and techniques</b> . They will apply these as part of the development process, which involves <b>generating ideas, trying them out, choosing the best solution, refining and adapting the idea, and handing over the finished artefact</b> to the tutor-assessor. They then <b>evaluate their project and present the outcomes</b> of the project to an audience. Learners are required to provide <b>written evidence</b> to accompany the project. It is estimated that this will be 1500-3000 words in length.
<b>Wider/Super Curriculum</b>	<p><b>Links to other subjects and wider world</b></p> <p>INDUSTRY - product concept to launch, designing for manufacture, understanding of iterative design processes relevant to industry practice</p> <p>ENVIRONMENT - sustainable design, impact of extraction/refining materials, structural safety</p> <p>SOCIETY - inclusive design, health &amp; safety, designing for different cultures,</p> <p>BUSINESS - cost, discount and percentage profit</p> <p>WIDER WORLD - develop intellectual curiosity about the design and manufacture of products and systems and their impact on daily life, considering their role as responsible designers and citizens</p> <p><b>Super curricular</b></p> <ul style="list-style-type: none"> <li>● New Designers visit</li> <li>● Firefly activities - super curricular links</li> <li>● Primary outreach</li> </ul> <p><b>Careers</b></p> <ul style="list-style-type: none"> <li>● Careers links on Firefly subject page</li> <li>● Year 12 Careers lesson</li> <li>● Graphic designer visiting speaker</li> <li>● subject specific work experience</li> </ul>