



DESIGN TECHNOLOGY

Design Technology

Why is the study of Design and Technology important?

Design and Technology is a practical and valuable subject. It enables students to actively contribute to the creativity, culture, wealth and well-being of themselves, their community and their nation. It teaches how to take risks and become more resourceful, innovative, enterprising and capable. Students develop a critical understanding of the impact and design and technology on daily life and the wider world. Additionally, it provides excellent opportunities for students to develop and apply value judgements of an aesthetic, economic, moral, social and technical nature both in their own designing and when evaluating the work of others. The subject at Outwood Academy Freeston is split into the following categories:

- **Cooking & Nutrition:** Design recipes and create food products while learning about the science of nutrition.
- **Textiles technology:** Learn how to use fabric and different construction techniques to plan and design and make textile products.
- **Resistant materials technology:** Work with materials such as metals, plastic, wood, and use them to make relevant and contemporary products.

What skills will the study of Design and Technology/Cooking & Nutrition teach you?

Design and Technology use knowledge, skills and understanding from within the subject itself and also a wide range of other sources, especially but not exclusively science and mathematics. Design and Technology will teach you to:

- Develop resilience by not being afraid of challenges when solving problems, but to break them down and keep trying.
- Be creative in developing solutions to real world problems.
- Use modelling and annotated sketches to develop and communicate ideas.
- How to act responsibly within a practical environment thinking of the safety of yourself and others.
- Identify how to competently use a range of practical techniques across a range of disciplines.
- Apply and use CAD/CAM equipment to design and manufacture a range of products and components considering scale of production and precision.
- Work independently and part of a team to solve complex problems.
- Construct reasoned arguments to ethical, social and moral problems that might have arisen due to technology and communicate these in an effective way.
- Identify links between different materials and contextual references.
- Test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups.
- Understand and apply the principles of nutrition and health.
- Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet.
- Become competent in a range of cooking techniques (for example, selecting and preparing ingredients: using utensils and electrical equipment, applying heat in different ways: using awareness of taste, texture and smell to decide how to season dishes and combine ingredients, adapting and using their recipes).
- Understand the source, seasonality and characteristics of a broad range of ingredients.
- Being able to plan how to cook food products in a safe and hygienic manner.

What will you know and understand from your study of Design and Technology & Cooking & Nutrition?

- How to classify materials including smart materials and discuss their physical properties.
- How to use simple electronic circuits incorporating inputs and outputs.
- How to manufacture products with reference to their materials physical properties.
- Students will learn to use and adjust equipment and machinery dependent on tasks.
- Use learning from science and mathematics to help design and manufacture components and products.
- Students will learn to consider the influence of a range of lifestyle factors and consumer choices when designing and analysing products.
- Students will know and understand additional factors to consider such as ergonomics, anthropometrics or dietary needs.
- How to use a variety of approaches, for example biomimicry and user-centred design to generate creative ideas and avoid stereotypical responses.
- Students will be able to evaluate their work against an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their product to their own designing and making.
- Students will be able to evaluate products through disassembly to determine how they are constructed and function and consider the life cycle analysis.
- How to competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment.
- Students will know the principles of nutrition and health including energy, nutrients, water, fibre, diet and health and nutritional needs throughout life and the risks of an unbalanced diet.
- Students will have a repertoire of predominantly savoury dishes in line with the principles of the eatwell guide.
- Students should be able to feed themselves considering personal preference, socio-economic aspects, nutritional and health needs.
- Students will understand the healthy and varied diets as depicted in the eatwell plate and 8 tips for healthy eating.
- Students should explore the origin and product of food products and ingredients.
- Students should consider how seasons may affect the food available.
- Students should consider the function, nutrient profile and sensory attributes of ingredients.
- Students should study a range of food commodities eg. cereals, fruits, vegetables, meat, fish, eggs, fats/oils, milk dairy food products.
- Students will develop a range of preparation, cooking and presentation skills.
- Students will learn how to prepare and cook safely to prevent food poisoning.
- Students will explore the different factors influencing food choice such as advertising, religion and special dietary needs

How does your study of Design Technology & Cooking & Nutrition support your study in other subjects?

Design Technology develops a number of skills that will support your study of other subjects, as so many of the skills you will acquire in Design Technology are transferable. Design Technology disciplines will develop your focus, resilience, self-expression, teamwork, mathematical skills and problem solving and communication skills, which will help you in **all** of your other subjects. It will give you an opportunity for creative expression and practical thinking and encourage you to think about how to improve home designs and encourage healthy eating etc. Some students may take this even further and discover a subject that provides them with a life-long hobby or career that enhances their life for years to come. All students will gain an understanding of healthy diets etc. The ability to think creatively and problem solve are crucial in Engineering, Mathematics and Science. It will foster an interest and skill in cooking and may lead to study of subjects such as catering etc.

How can you deepen your understanding of Design Technology & Cooking & Nutrition?

To enhance your work in lessons, there will be times when we explore the professional workplace and wider design practices and materials. This will deepen your understanding of professional work and introduce you to new techniques and ideas.

You will also have the opportunity to deepen your understanding of Design Technology disciplines through extracurricular opportunities, where you can continue to develop your creative ideas, or work on specific design projects. During enrichment clubs, you will have the opportunity to meet food enthusiasts from other year groups, where you can share ideas, critique each other's work and continue to develop your technique.

There may also be an opportunity to participate in trips as well as exhibiting your own work within the Academy. Occasionally, there will be opportunities to enter national or Trust competitions to gain additional audiences and recognition for your work.

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How are you assessed in Design Technology & Cooking & Nutrition?

Throughout the 5 years in Design Technology you are assessed using the following assessment objectives which ensure that you can cumulatively build your subject understanding in preparation for future GCSE and A Level study. There are 3 assessment points for Y7-9 and 6 assessment points for Y10-11 that we term Praising Stars©. In the lower years before certificated study we assess how students are performing against age related expectation and as students' progress on to GCSE we assess how their current stage of study reflects how they are on track to reach their end of KS4 targets which are formulated on aspirational expectation from their KS2 starting points. For both lower and upper years we make an informed judgement from our holistic assessments based on our subject mapping of expectation across the Design Technology curriculum.

Assessment Objectives Design and Technology & Cooking & Nutrition?

	Design	Make	Evaluate	Technical Knowledge
KS4	<p>Understand that all design and technological practice takes place within contexts which inform outcomes</p> <p>Investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas</p> <p>Use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation.</p> <p>Design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>Develop and apply in-depth knowledge by selecting and working with appropriate materials and components in order to produce a prototype</p> <p>Apply in depth knowledge using appropriate and accurate marking out methods including: measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste.</p> <p>Follow procedures for safety and write risk assessments.</p> <p>Use specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used</p> <p>Use appropriate surface treatments and finishes for functional and aesthetic purposes</p>	<p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Critically evaluate new and emerging technologies to inform design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>Understand the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems.</p> <p>Know how energy is generated and stored in order to choose and use appropriate sources to make products and to power systems.</p> <p>Understand developments in modern and smart materials, composite materials and technical textiles.</p> <p>Understand how electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs</p> <p>Understand how the use of programmable components are used to embed functionality into products in order to enhance and customise their operation</p>

				<p>Understand the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces:</p> <p>Know how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p>
KS4	<p>Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacture etc.</p> <p>Consider the influence of a range of lifestyle and consumer choices when designing products.</p> <p>Take creative risks when making design decisions.</p> <p>Analyse where human values may conflict and compromise has to be achieved.</p> <p>Decide which design criteria clash</p>	<p>Produce costings spreadsheets for products they design and make.</p> <p>Match and select suitable materials and their fitness for purpose.</p> <p>Adapt their method of manufacture to changing circumstances.</p> <p>Recognise when it is necessary to develop a new skill or technique.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p> <p>Make independent choices when selecting and using a broad range of</p>	<p>Evaluate the concept of circular economy approaches in relation to product development and consumption.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>How to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials, and how they can be used to advantage.</p>

	<p>and determine which should take priority.</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>manufacturing techniques including hand craft skills and machinery to manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</p>		
Y8	<p>Use research and begin to explore, such as the study of different cultures, to identify and begin to understand user needs.</p> <p>To identify and solve issues within a design development task.</p> <p>Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of uses.</p> <p>Use a variety of influences, to generate creative ideas and avoid stereotypical responses.</p> <p>Use 2D and 3D to model and develop their ideas.</p> <p>Use CAD software to validate their designs in advance of manufacture.</p> <p>Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools.</p>	<p>Select from a wider, more complex range of materials and components, taking into account their properties.</p> <p>Make simple use of planning tools for instance Gantt charts, communicate their plans clearly so that others can implement them.</p> <p>Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives.</p> <p>Make independent choices when selecting and using CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p> <p>Make independent choices when selecting and using a broad range of manufacturing techniques including hand craft skills and machinery to</p>	<p>Select appropriate methods to evaluate their products in use and modify them to improve performance.</p> <p>Produce shorts reports making suggestions for improvements.</p> <p>Evaluate products that they are less familiar with using themselves.</p> <p>Evaluate products considering life cycle analysis.</p> <p>Evaluate how products can be developed considering the concept of cradle to grave.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists</p>	<p>How to apply computing and use electronics to embed intelligence in products that respond to inputs.</p> <p>How to control outputs such as actuators and motors.</p> <p>How to use software and hardware to to develop programmes and transfer these programmable components for example, microcontrollers.</p> <p>How to make use of microcontrollers in products they design and manufacture themselves.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials,</p>

	Consider additional factors such as ergonomics and anthropometrics.	manufacture products precisely. Apply a range of finishing techniques to a broad range of materials.	and manufacturers and be able to relate their products to their own designing and making.	and how they can be used to advantage.
Y7	<p>Use research, such as the study of different cultures, to identify user needs.</p> <p>Be able to outline a simple specification to inform design ideas and guide their thinking.</p> <p>Use 2D packages to model their ideas.</p> <p>Produce models of their ideas using CAM to test ideas.</p> <p>Be able to independently generate creative ideas inform by stimulus using annotations to explain key features relating to brief/specification.</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>Produce ordered sequences and schedules for manufacturing products they design detailing resources required.</p> <p>Make use of specialist equipment to mark out materials.</p> <p>Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives.</p> <p>Select and use CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality.</p> <p>Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p> <p>Select and use a broad range of</p>	<p>Evaluate their products against their original specification and identify ways to improve them.</p> <p>Actively involve others in the testing of their products.</p> <p>Evaluate products through disassembly to determine how they are constructed and function.</p> <p>Evaluate the positive and negative impact that products can have in the wider world.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>How to classify materials by structure e.g hard woods, soft wood, ferrous and non-ferrous, thermoplastics and thermosetting plastics.</p> <p>Consider the physical properties of materials. E.g brittleness malleability.</p> <p>How to use simple electronic circuits incorporating inputs and outputs.</p> <p>Consider textile fibre sources eg.natural and synthetic.</p> <p>How materials can be cast in moulds.</p> <p>Make use of sensors to detect heat, light etc such as thermistors and light dependent resistors.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p>

		<p>manufacturing techniques including hand craft skills and machinery to manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</p>		<p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials, and how they can be used to advantage.</p>
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Assessment Objectives Cooking & Nutrition

KS3 Programmes of Study for food and Catering	LO1 Understand the environment in which hospitality and catering providers operate	LO2 Understand how hospitality and catering provisions operate	LO3 Understand how hospitality and catering provision meets health and safety requirements	LO4 Know how food can cause ill health	LO5 Be able to propose a hospitality and catering provision to meet specific requirements
Year 10 & 11	<p>AC1.1 describe the structure of the hospitality and catering industry</p> <p>AC1.2 analyse job requirements within the hospitality and catering industry</p> <p>AC1.3 describe working conditions of different job</p>	<p>AC2.1 describe the operation of the kitchen</p> <p>AC2.2 describe the operation of front of house</p> <p>AC2.3 explain how hospitality and catering provision meet customer requirements</p>	<p>AC3.1 describe personal safety responsibilities in the workplace</p> <p>AC3.2 identify risks to personal safety in hospitality and catering</p> <p>AC3.3 recommend personal safety control</p>	<p>AC4.1 describe food related causes of ill health</p> <p>AC4.2 describe the role and responsibilities of the Environmental Health Officer (EHO)</p> <p>AC4.3 describe food safety legislation</p>	<p>AC5.1 review options for hospitality and catering provision</p> <p>AC5.2 recommends options for hospitality.</p>

	<p>roles across the hospitality and catering industry</p> <p>AC1.4 explain factors affecting the success of hospitality and catering providers</p>		<p>measures for hospitality and catering provision</p>	<p>AC4.4 describe common types of food poisoning</p> <p>AC4.5 describe the symptoms of food induced ill health</p>	
Year 9	<p>Understand what hospitality and catering mean.</p> <p>Know different kinds of providers and service styles.</p> <p>Understand what skills are needed to work in the industry and be able to describe different job roles within the industry.</p>	<p>Understand the importance of team work both BOH, FOH and between the two.</p> <p>Will be able to put together a basic kitchen brigade and explain the different jobs and responsibilities.</p> <p>Will be able to explain why portion control is important in a food business and give examples on how this could be managed</p>	<p>Understand and can explain hygiene and safety rules in a kitchen and make some links to the catering industry.</p>	<p>Understand how bad hygiene can lead to food poison and be able to give examples of different kinds of food poisons.</p>	<p>Will be able to identify the pros and cons of a selection of different kinds of providers and service styles.</p>
KS3 Programmes of Study for food	Understand health and safety relating to food and cookery	Understand and apply the principles of nutrition and health	Understand the source, seasonality and characteristics of a broad range of ingredients	Understand factors relating to food choice (so that they are able to feed themselves and others a healthy and varied diet).	Develop practical cooking skills (so that they become competent in a range of cooking techniques and able to cook a repertoire of predominantly savoury dishes)
Year 8	<p>Know and understand how to identify risks (food poisoning, cross</p>	<p>Know and understand how nutritional requirements differ for specific groups of</p>	<p>Know and understand how ingredients have different effects in a recipe and be</p>	<p>Know and understand the range of cultural and</p>	<p>Learners will make dishes of increasing complexity that further develop their</p>

	contamination) and minimise hazards in the cooking environment. Know and understand the difference between use by and best before dates) Know and understand the principles of safe storage, cooking and reheating foods.	people (Life stages, allergies and intolerances) To understand how nutritional information and allergy advice on food packaging can be used to help make healthy choices (traffic lights).	able to describe the sensory, nutritional and physical functions of ingredients in recipes. To understand the term seasonality and explain the benefits of buying and using seasonal ingredients.	ethical factors that determine food choices: Religion Vegetarian/vegan Fair trade Animal welfare Advertising/marketing.	food preparation and cooking skills and use a range of commodities. -Making/shaping doughs -Sauce making -Dealing with raw meat and poultry - Blending - Frying incl. stir frying -creaming method -melting method -Seasoning -Test for readiness
Year 7	Know and understand safe and hygienic working practices and the practical steps they can take to remain safe and hygienic. Being able to identify and explain the 3 different kinds of contaminants. Know and understand safe preparation, usage, cleaning and storage of utensils and equipment.	Know and understand what is meant by a balanced diet using the current UK dietary recommendations (Eatwell guide and 8 Tips) Know the sources and understand the functions of the nutrients that make up a balanced diet Know and understand the importance of exercise and energy balance in maintaining a healthy weight.	know and understand the main food groups and examples of foods for each group (cereals, fruit, vegetables, meat, fish, eggs, fats/oils, milk/dairy food products). To be able to use sensory words when describing food items and ingredients. To start to identify functions of ingredients.	Know and understand the range of social and environmental factors that determine food choices: Personal/family preference Availability (seasonal/locality) Food miles Food waste	Learners will be able to demonstrate a range of basic food preparation and cooking skills using a variety of food commodities -Weighing/measuring -Knife skills (bridge/ claw) -Peeling - Segmenting -Boiling/ simmering -Rubbing in -All-in-one -Melting -Rolling and cutting out -Baking

Assessment Grids – Age Related Assessment Descriptors

Scheme of Work	Design	Make	Evaluate	Technical Knowledge
<p>Excelling <i>Working well above ARE</i></p> <p>(Trajectory for Grade 8 – 9)</p>	<p>I can explain how engineers/ designers from different sectors contribute /generate a product.</p> <p>I can create imaginative, creative and innovative ideas, fully avoiding design fixation and with full consideration of design functionality, aesthetics and innovation.</p> <p>I can produce detailed annotation that clearly justifies how I have considered the user/client needs and links directly to the context selected.</p> <p>I can produce a complex investigation into the work of others and use this to inform my designs.</p>	<p>I can develop an improved final solution using CAD and modelling in relation to the brief.</p> <p>I have correctly used tools, equipment and materials (including CAM where appropriate) have been consistently used or operated safely with a high level of skill.</p> <p>I can produce a high quality prototype that has the potential to be commercially viable and has been made to meet the needs of the end user.</p> <p>I have evidenced a constant use of quality control to ensure a high quality, accurate prototype. I have clearly shown where I have adapted my work to include feedback from QC checks and/or users.</p>	<p>I can fully justify the development of an improved final solution and evaluate use of the design process, with reference to the brief and peer review.</p> <p>I have a comprehensive understanding of testing, analysing and evaluating existing products and ongoing work.</p> <p>I used judgements for independent and external feedback to inform and record modifications that I make.</p>	<p>I have knowledge and understanding of the impact of new and emerging technologies from a user, designer and manufacturers point of view.</p> <p>I can discuss and explain the impact of resource consumption on the planet and measures taken to improve this.</p> <p>I can implement a sensitive approach with design and evaluation, and avoid negative impact on individuals and groups. E.g inclusive design/religious beliefs.</p> <p>I can identify and explain when/why and how various production techniques and systems are used in manufacture. For example, automation, JIT.</p>

<p>Exceeding <i>Working beyond ARE</i></p> <p>(Trajectory for Grade 6 – 7)</p>	<p>I research and explore relevant information based on the user's needs.</p> <p>I know how to use social, moral and cultural information to understand the user more clearly.</p> <p>I can independently solve design problems and understand how to develop problems that are given to me.</p> <p>I have developed a specification that allows me to be innovative, functional, and create an appealing design that responds to the users needs.</p> <p>I have used a variety of approaches, for example, biomimicry and user centred design which has generated creative ideas that avoid stereotypical response to the brief.</p>	<p>I can select specialist tools in my practical and my choices are justified.</p> <p>I justify the reasons for my choice of materials, taking into consideration their properties.</p> <p>I justify the process that I choose to make my product.</p> <p>I can use CAM in my work.</p> <p>I am accurate and precise when I work.</p> <p>I can work very safely and can coach others to do.</p>	<p>I can compare and contrast existing products, analysing them and explaining how this will influence my design.</p> <p>I understand and can explain developments in DT, for example use of robotics in manufacturing.</p> <p>I test, evaluate and refine my ideas and products against a specification. I always take into account the views of users/groups.</p> <p>I understand the responsibilities of designers and engineers and clearly show this in my work.</p> <p>This could include inclusive design, sustainability etc.</p> <p>I can evaluate the impact of my product on individuals, society and the environment.</p>	<p>I understand and use the properties of materials and the performance of structural elements to achieve functioning solutions.</p> <p>I understand how more advanced mechanical systems are used in my products and enable changes in movement and force.</p> <p>I understand how more advanced electrical and electronic systems can be powered and used in my product.</p> <p>I apply computing and use electronics to embed intelligence in my product that responds to inputs, and controls output, using programmable components.</p>
<p>Achieving <i>Working at ARE</i></p> <p>(Trajectory for Grade 4 – 5)</p>	<p>I use research to state and describe the user's needs.</p> <p>I can generate at least three different ideas, listing the constraints and develop them so they're improved following user/specification analysis.</p>	<p>I can describe the tools and equipment I use.</p> <p>I can describe a range of materials that I use.</p> <p>I can describe the processes that I use.</p> <p>My work is generally accurate and pay attention to quality of finish.</p>	<p>I analyse existing products on the market that are relevant and use these to inform my ideas.</p> <p>I can test and evaluate my product against the specification and improve my product as a result.</p> <p>I understand what my responsibilities are as a designer including reference to positive and</p>	<p>I can understand the properties of materials and select them to improve functioning solutions.</p> <p>I understand how electrical and electronic systems can be powered and used in their products.</p> <p>I apply computing and use electronics in my product that</p>

	<p>I analyse research to write a full specification which includes users views/needs.</p> <p>I can select different methods to develop and improve ideas e.g. CAD/Modelling in response to the specification.</p> <p>I annotate ideas in response to the specification and clearly show how/why the design has been improved.</p>	<p>I always work safely adhering to workshop safety rules.</p>	<p>negative impacts that products may have on the wider world.</p> <p>I can describe new technologies and smart materials and describe how they can help the environment and end product.</p>	<p>respond to input and control outputs.</p> <p>I understand how mechanical systems are used in my product to enable changes in movement and force.</p> <p>I can independently select and use CAD/CAM in design and manufacture of my product (identify between 2D and 3D).</p>
<p>Developing <i>Working towards ARE</i> (Trajectory for Grade 2 – 3)</p>	<p>I use research to identify the users needs.</p> <p>I can generate at least three different ideas and develop them so they're improved.</p> <p>I use research to write a basic specification.</p> <p>I use different methods to develop and improve ideas e.g. CAD/Modelling.</p> <p>I annotate ideas so they're clear to others.</p>	<p>I can name the tools and equipment I use.</p> <p>I can name a range of materials that I use.</p> <p>I can list the processes that I use.</p> <p>My work is mostly accurate.</p> <p>I work safely adhering to workshop safety rules.</p>	<p>I look at existing products on the market that are relevant and use these to inform my ideas.</p> <p>I can test and evaluate my product against the specification.</p> <p>I understand what my responsibilities are as a designer and show this in my work.</p> <p>I know about new technologies and smart materials and know how they can help the user.</p>	<p>I can recall the properties of materials.</p> <p>I understand systems and control and know what an input and output is.</p> <p>I understand mechanical systems. I can select how CAD/CAM can be used in manufacture (identify between 2D and 3D).</p>

<p>Emerging <i>Working below ARE</i></p> <p>(Trajectory for Grade U – 1)</p>	<p>I can outline how the product meets my own needs.</p> <p>I know what a specification is and can work from one.</p> <p>My ideas are sketched and labelled with basic notes.</p>	<p>I can prepare myself for practical.</p> <p>I can name some of the tools I use.</p> <p>I can use equipment safely.</p> <p>Practical work is reasonably accurate.</p>	<p>I look at products to help me with my ideas.</p> <p>I can outline what I designed and what I made and state improvements needed.</p> <p>I know what some of my responsibilities are as a designer.</p> <p>I know a bit about new technologies and smart materials and how they can help the user.</p>	<p>I can identify the properties of some materials.</p> <p>I understand a little about systems and control and know what an input and output is.</p> <p>I understand basic mechanical systems.</p> <p>I know how CAD/CAM can be used in manufacturing.</p>
<p>Assessment Objective</p>	<p>Design AO1</p>	<p>Make (Include H&S) AO2</p>	<p>Evaluate AO3</p>	<p>Technical Knowledge AO4</p>

(Assessment Objectives refer to Design and Technology Programmes of Study)

Cooking and Nutrition

Scheme of Work	Understand health and safety relating to food and cookery	Understand and apply the principles of nutrition and health	Understand the source, seasonality and characteristics of a broad range of ingredients	Understand factors relating to food choice	Develop practical cooking skills
Excelling <i>Working well above ARE</i> (Trajectory for Grade 8 – 9)	I can describe a range of control measures to reduce the risk of food poisoning.	I can evaluate the risks of not following a balanced diet and can give advice on which foods should be eaten or avoided to prevent diet related illness.	I am able to evaluate the impact of using incorrect ingredients, methods, temperatures and timings on the quality of outcomes.	I can evaluate the effects of budget on food choice and nutritional health.	I can make dishes that demonstrate higher level practical skills in preparation for year 9. I can demonstrate a range of finishing techniques that ensure my products are well presented and attractive. I can use accurate portion control.
Exceeding <i>Working beyond ARE</i> (Trajectory for Grade 6 – 7)	I can describe some of the causes and symptoms of food poisoning and can name a range of food poisoning bacteria and sources.	I can apply my knowledge of diet and nutrition to adapt a recipe to suit individual needs.	I can explain the impact of different cooking methods on the nutritional content of foods (boiling, steaming, grilling and frying)	I can explain the causes of food poverty in the UK and the wider world. I can explain the benefits of Fair Trade. I can describe how advertising and marketing affects food choices.	I can work independently using my own recipe. I am able to independently resolve problems that arise during practical work. I can work with accuracy and precision. I can prepare well-presented dishes

<p>Achieving <i>Working at ARE</i></p> <p>(Trajectory for Grade 4 – 5)</p>	<p>I can explain the causes of cross contamination and food poisoning and how they can be prevented (linked to storage, cooking and reheating). I can demonstrate high levels of food hygiene when preparing foods I can explain the difference between a best before date and a use by date.</p>	<p>I can describe the nutritional needs of different groups of people (life stages, allergies and intolerances) I can explain how the information on food packaging can be used to make healthy choices</p>	<p>I can describe the physical, sensory and nutritional properties of the ingredients in my recipes.</p>	<p>I can explain why individuals choose or avoid foods based on their beliefs/ethics including animal welfare. I can explain the benefits of choosing organic produce.</p>	<p>I can follow a recipe independently. I am able to select the most appropriate equipment for the practical task. I can prepare dishes that demonstrate a range of more complex food preparation and cooking techniques I can taste and season foods. I can judge when foods are cooked/ready.</p>
<p>Developing <i>Working towards ARE</i></p> <p>(Trajectory for Grade 2 – 3)</p>	<p>I can identify possible hazards and suggest how they can be made safe. I am able to use the cooker safely and independently. I can use a range of kitchen equipment safely and independently. I can explain how and where to store foods correctly.</p>	<p>I can explain what makes a healthy diet using the Eatwell Guide, 5-a-day and 8 tips for healthy eating. I can identify the function and sources of a range of nutrients. I can explain energy balance and the importance of diet and exercise in maintaining a healthy weight.</p>	<p>I can name a range of foods within each commodity group. I know that foods are processed to create products and can explain the difference between primary and secondary processing.</p>	<p>I know that people choose food for different reasons including budget. I can explain the benefits of eating seasonal produce. I can explain food miles and the effect they have on the environment.</p>	<p>I can demonstrate a range of basic food preparation and cooking techniques. I can follow a recipe with guidance and prompts.</p>
<p>Emerging <i>Working below ARE</i></p>	<p>I can prepare myself and my work area for practical work. I can use and clean basic equipment safely.</p>	<p>I can classify foods using the Eatwell guide and understand what is meant by 5-a-day.</p>	<p>I can name some food commodities (cereals, fruit, vegetables, meat, fish, eggs, fats/oils, milk/dairy food products)</p>	<p>I know that people choose food based on likes/dislikes. I can identify a range of UK seasonal produce.</p>	<p>I can prepare and cook a recipe following teacher demonstrations and with support.</p>

(Trajectory for Grade U – I)	I can identify which foods need to go in the fridge.	I can identify which foods I should eat less of and which foods I should eat more of. I can explain which foods cause the main health problems (sugar, fat, salt)	I can identify whether foods are caught, reared or grown. I can identify foods that are primary processed and secondary processed.	I can identify a range of imported foods including Fair Trade products.	I can identify and select the correct equipment for the task with guidance.
Assessment Objective	Health and Safety	Nutrition and Health	Source, Seasonality and Characteristics of Ingredients	Food Choice	Cooking Skills

(Assessment Objectives refer to Design and Technology Programmes of Study)

Wider Subject Curriculum – *enrichment, homework programs, quizzing, awards, trips, visits, reading / vocabulary lists, competition etc.*

Resources

Glossary of key terms, rules & formula - *to be spelt / used correctly*

Key Terms

Vocabulary	Description
Sustainability	Working in a way that will ensure a continued supply of resources and energy for future generations (renewable/non-renewable/finite).
Environmental	Concerned with the impact or change in the environment.
Aesthetic	Our perception of beauty including sight, sound, smell, touch (mainly visual for Product Design).
Texture	The feel, appearance or consistency of a surface, substance or fabric.
Durability	The ability of a material to be hard-wearing.
Hardwoods	Come from deciduous or broadleaf trees. They are generally slow growing, hard, sold by cubic meters then rough sawn to size or mould (dowel).
Softwoods	Come from coniferous trees with needles instead of leaves. They are generally faster growing, softer, easier to work with. Supplied in standard sizes that are either rough sawn or planed smooth (PSE).
One-off	Only one product is made at a particular time (usually high quality/unique).
Batch	A series of identical products are made together, in small or large numbers (usually for a specific event).
Mass production	Products made on a production line with each worker responsible for a particular stage. Products are made in larger numbers to reduce the cost of each item.
Prototype	An accurate or working representation of what the product will do.
Quality control	Guarantees the accuracy of a product (size, material quality/ visual features).
Quality Assurance	Checks the machines, systems and staff within an organisation that make the products.

Risk assessment	The likelihood of safety problems arising from an activity (in designing and making a product).
CAD	Computer aided design is a drawn product or part of a product on a software package that can then be exported to and CAM machine (Increases accuracy and ease of repeat cuts).
CAM	Computer aided manufacture, a machine that turns a digital drawing into numerical code that plots a path for an item to be cut/drilled/milled out of a section of material.
Thermoplastics	These soften when heated and can be reshaped.
Thermosetting plastics	Heated and moulded into shape these plastics can not be reshaped with heat because the polymer chains have been interlinked.
Bacteria	Pathogenic microscopic living organisms, usually single-celled, that can be found everywhere. They can be dangerous, such as when they cause infection, or beneficial, as in the process of fermentation (for wine).
Balanced Diet	A diet which provides all the necessary nutrients in the correct amount/proportions to meet the body's needs.
Cross Contamination	The transference of bacteria from one surface to another.
Danger zone	Range of temperatures between 5°C to 63°C at which bacteria begin to multiply rapidly.
Food Poisoning	Illness caused by pathogenic bacteria/toxins, for example e-coli: salmonella, listeria, staphylococcus aureus.
High Risk Foods	Foods that are high in moisture and nutrients, especially protein (perishable foods: meat, shellfish, cooked rice, eggs, milk, cream). They support the growth of pathogenic microorganisms, such as bacteria.
Nutrients	The properties found in food and drinks that give nourishment – vital for growth and the maintenance of life. The main nutrients needed by the human body are carbohydrates, proteins, fats, vitamins and minerals.

Organic	Food produced by methods that comply with the standards of organic farming. Standards vary worldwide, but organic farming in general features practices that strive to recycle resources, promote ecological balance, and conserve biodiversity.
Processed Foods	Food processing is any deliberate change in a food that occurs before it's available for us to eat. It can be as simple as freezing or drying food to preserve nutrients and freshness, or as complex as formulating a frozen meal with the right balance of nutrients and ingredients.
Seasonal Foods	Foods that are at the stage of their natural life cycle when they are ready for harvest or to be caught, for example strawberries are at their best in the summer.
Vegetarian/Vegan	A lacto-vegetarian diet includes dairy products and plants, and a lacto-ovo vegetarian diet includes eggs, dairy products and nuts. A vegan does not eat any animal products.

How can Design Technology & Cooking & Nutrition support your future?

We offer the study of GCSE and your continued study in this fantastic subject. Yet we know that choice and personal interest are important aspects of worthy study. Whether you have continued to study a discipline of Design Technology into GCSE or A-Level or not you will have gained access to this wide enriching subject and its study of the various disciplines will have taught you to think differently and deeply.

Design courses are offered at most prestigious universities and there are many technical and vocational qualifications that can be studied in engineering, product design, graphics, electronics, catering, nutrition etc as well as routes into apprenticeships etc. The very fact that you have been able to study creative thinking, problem solving, planning and design principles will help your future application be they for colleges, universities, apprenticeships or employment.

Careers linked to Design Technology:

- Product Designer
- Civil engineer
- Quantity Surveyor
- Graphic Designer
- Fashion Designer
- Branding designer
- Software Engineer
- Catering and Hospitality

- Nutritionist
- Food technologist
- Manufacturing Engineer / manager
- Architect
- Construction
- Aerospace engineer

The list is endless as study of Design Technology opens up a world of opportunities

Context – Subject Curriculum Progression Overview Outwood Academy Freeston

DESIGN TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW OUTWOOD ACADEMY FREESTON			
	YEAR 7	YEAR 8	YEAR 9
	<p>Year 7 D&T/ Cooking & Nutrition</p> <p>Students will have two hours of D&T a week which will be split over the different elements of D&T to ensure a broad curriculum is achieved where the key focus is learning about core materials. Students operate on a carousel system throughout the academic year.</p>	<p>Year 8 D&T/ Cooking & Nutrition</p> <p>Students will have two hours of D&T a week which will be split over the different elements of D&T to ensure a broad curriculum is achieved where the key focus is developing design and manufacturing proficiency whilst building on their technical knowledge. Students operate on a carousel system throughout the academic year.</p>	<p>Year 8 D&T/ Cooking & Nutrition</p> <p>Students will have one hour of D&T or Cooking and Nutrition a week which will be split over the different elements of D&T to ensure a broad curriculum is achieved where the key focus is developing design and manufacturing proficiency whilst building on their technical knowledge. Students operate on a carousel system throughout the academic year.</p>
Resistant Materials	<p>Coin Collector & Toy mechanism projects</p> <ul style="list-style-type: none"> ● Health and Safety in a workshop - Knowledge and practical. ● How risk assessments work 	<p>Balancing toy & Buzz wire game</p> <ul style="list-style-type: none"> ● Health and Safety in a workshop - Knowledge and practical. ● Product Analysis of similar products 	<p>Birdhouse & Sweet dispenser</p> <ul style="list-style-type: none"> ● Health and Safety in a workshop - Knowledge and practical. ● Product Analysis

	<ul style="list-style-type: none"> • Types of motion and give examples • Types of mechanisms in particular levers and cams • Working with polymers to produce skateboard keychain • Timbers and their properties • Working with timbers to produce a coin collector and a toy mechanism • Sustainability in relation to timbers • Evaluating designs and testing them • Introduction and demonstration of the laser cutter CAD/CAM <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • Designing and design techniques • Accurate Marking out • Safe use of Coping Saws • Safe use of Pillar Drills • Identification of Man-Made, Hardwood and Softwood timber • Problem solving skills • Constructing Cams and levers to operate • Safe use of Tenon Saw • Safe use of Fret Saw • Wasting techniques • Finishing techniques 	<ul style="list-style-type: none"> • Working with timbers to produce stands • Surface finishes for timbers • Working with metals to produce the balancing toy and buzz wire game • Use of the brazing hearth to join metals • Isometric drawing • Joining techniques to manufacture the toy and game • Electrical components and simple electronic circuits • Evaluating and text designs • Learn to understand and follow engineering drawings <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • Designing and design techniques • Accurate marking out • Critical thinking of existing products • Cutting, joining and finishing metals • Safe use of Coping Saws • Safe use of Pillar Drills • Safe use of Line Benders • Safe use of Tenon Saw • Safe use of Fret Saw • Safe use of an Hacksaw • Wasting techniques • Finishing techniques • Safe use of Belt Sander • Electronic components and circuits and the safe use of a soldering iron. 	<ul style="list-style-type: none"> • Client based questionnaires • Working with timbers to produce to produce new products • Surface finishes for timbers • Working with polymers to produce a sweet dispenser • Isometric and Orthographic drawing • Joining techniques to manufacture • Use of mechanisms for problem solving • Evaluating designs <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • Designing and design techniques • Accurate Marking out • Critical thinking of existing products • Safe use of Coping Saws • Safe use of Pillar Drills • Safe use of Line Benders • Safe use of Tenon Saw • Safe use of Fret Saw • Safe use of Vacuum Former • Wasting techniques • Finishing techniques • Safe use of Belt Sander
<p>Cooking & Nutrition</p>	<ul style="list-style-type: none"> • Health, Safety and Hygiene in Food - Knowledge and building practical skills. • Different kinds of contaminants. • Balanced Diets- The Eatwell Guide, 5-a-day and 8 Tips for a healthier lifestyle. 	<ul style="list-style-type: none"> • Nutrition incl. Energy Balance • Factors affecting food choice incl. Religion, nutritional requirements for different people, allergies and intolerances, advertising, the environment, vegans and vegetarians, fair trade and animal welfare. 	<ul style="list-style-type: none"> • What is an industry and what is hospitality and Catering? • How can we produce food in a hygienic and safe manner? • How do you produce a successful risotto? • How do you prepare the different cuts of fruit

	<ul style="list-style-type: none"> • Understanding the main food groups. • Start to think about the function of ingredients. • Safe Storage, cooking and reheating foods. • Sensory words • Basic planning (ingredients, equipment, method) • Basic nutrition (macro and Micro nutrients) <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • -Weighing/measuring • -Knife skills (bridge/ claw) • -Peeling • - Segmenting • -Boiling/ simmering • -Rubbing in • -All-in-one • -Melting • -Rolling and cutting out • -Baking 	<ul style="list-style-type: none"> • Understanding the sensory, nutritional and physical functions of ingredients. • Food poisoning. • Functions of ingredients <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • -Making/shaping doughs • -Sauce making • -Dealing with raw meat and poultry • -Blending • -Frying incl. stir frying • -Creaming method • -Melting method • -Seasoning • -Test for readiness 	<p>and vegetables?</p> <ul style="list-style-type: none"> • How do you prepare the different cuts of fruit and vegetables? • Portion control? Why is it important and how can it be managed? • How can we produce food in a hygienic and safe manner? • How can we produce a dovetailed plan and what information is needed? <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> • -Making/shaping doughs • -Sauce making • -Dealing with raw meat and poultry • -Blending • -Frying incl. stir frying • -Creaming method • -Melting method • -Seasoning • -Test for readiness • -Health and safety in the kitchen • -How to complete a risk assessment
Textiles	<p>Juggling Kit: Drawstring Juggling Bag with Juggling Pyramids.</p> <ul style="list-style-type: none"> • Enforcement of classroom procedures. • Enforcement of H&S in the classroom including completing a risk assessment. • Introduction to designing and developing a product. • Introduction to fibres, fabrics and fabric construction. • Knowledge of dyeing techniques. • Develop core technical knowledge, (basic design and construction skills). • Students can analyse existing products and 	<p>Activity Cube</p> <ul style="list-style-type: none"> • Health and Safety in a workshop Knowledge and practical • Environmental and social issues. • Design ideas, product analysis (ACCESS FM) • Systems approach to designing. • Knowledge of fabrics, fibres and the relevant equipment and techniques. • To further enhance their design skills. • Knowledge of basic Textile construction and development of basic skills. 	<p>Pyjama shorts</p> <ul style="list-style-type: none"> • Reinforce textile workshop procedures. • Reinforce H&S in a textile workshop. • Systems approach to textile designing. • Knowledge of fabrics, fibres and the relevant equipment and techniques. • To further enhance their design skills - specifically with clothing/fashion. • Knowledge of clothing construction and development of basic skills. • Ability to analyse and reflect upon existing products and their own practise. • Develop some core knowledge.

	<p>evaluate their own work.</p> <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> ● Health and Safety in a workshop. Knowledge and practical. ● Design brief, task analysis, product analysis ● Research/ inspiration board ● Design considerations ● Modelling out of paper (iteration) ● Design specification. ● Tie-dye, hand embroidery and applique ● CAD embroidery machine. ● Sewing Machine Safety ● Basic measuring & marking ● Iron safety ● Finishing techniques ● Testing & Evaluating ● Standard Components ● Material properties (basics) 	<ul style="list-style-type: none"> ● Develop some core knowledge. ● Realisation and development of a 2d design into a 3d product. ● Producing products to meet the client's needs. ● <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> ● Surface Finishes - Testing & Evaluating - Scales of Production ● Materials and properties. ● Components and fastening methods. ● Woven and non-woven fabrics. ● Basic hand-stitches. ● Use of the sewing machines ● Use of fabric scissors ● Fabrication and embellishment of felt 	<ul style="list-style-type: none"> ● Realisation and development of a 2d design into a 3d functional product. <p>Demonstrating the following skills;</p> <ul style="list-style-type: none"> ● Health and Safety in a workshop. Knowledge and practical. ● Design brief, task analysis, product analysis ● Research/ inspiration board ● Design considerations ● Modelling out of paper (iteration) ● Design specification. ● Tie-dye, hand embroidery and applique ● CAD embroidery machine. ● Sewing Machine Safety ● Basic measuring & marking ● Iron safety ● Finishing techniques ● Testing & Evaluating ● Standard Components ● Fabric material properties
	<p>Once students have completed their three year key stage 3 course in Design and Technology and Food & Nutrition, they will have the opportunity to progress onto a GCSE or Vocational course in the above subjects.</p> <p>GCSE Design & Technology - Textiles GCSE Design & Technology - Resistant Materials Btec Hospitality and Catering</p>		