



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 so become more resourceful, innovative, enterprising and capable. Students develop a critical understanding of the impact of design and technology on daily life and the wider world. Additionally, it provides excellent opportunities for students to develop and apply value judgments of an aesthetic, economic, moral, social, and technical nature both in their own designing and when evaluating the work of others.

Design and Technology enables students to understand and apply iterative design processes through which they explore, create and evaluate a range of outcomes. It enables students to use their creativity and imagination to design and make prototypes that solve real and relevant problems, whilst considering their own and others' needs, wants and values. It gives students opportunities to apply knowledge from other disciplines, including mathematics, science, art and design, computing and the humanities. Students will acquire subject knowledge in design and technology that builds on Key Stage 3, incorporating knowledge and understanding of different materials and manufacturing processes in order to design and make, with confidence, prototypes in response to issues, needs, problems and opportunities. Students learn how to take design risks, helping them to become resourceful, innovative and enterprising citizens.

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

Across the curriculum the aims of the Design and Technology curriculum is to include the development of capability within the subject, along with broad general skills. Below details the skills and knowledge that will be gained across the five years and this list whilst not exhaustive also includes skills and knowledge gained in key stage 3.

What skills will the study of Design and Technology 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 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, taking into account the views of intended users and other interested groups.
- Demonstrate their understanding that all design and technological activity takes place in contexts that influence the outcomes of a final design concept
- Develop realistic design ideas that come through exploring design opportunities and users' needs, wants and values
- Use imagination, experimentation and combine ideas when designing
- Develop the skills to analysis and enhance their own ideas while designing and manufacturing
- Communicate their design ideas and decisions using different methods and media.
- Develop skills, including the planning and organisation of time and resources when managing their own project work
- Develop a broad knowledge of materials, components and technologies and practical skills to develop high-quality, innovative and functional prototypes
- Be open to explore and take design risks in order to stretch the development of design ideas
- Consider the costs, commercial viability and marketing of products
- Use key design and technology terminology, including those related to: designing, innovation and communication; materials and technologies; making, manufacture and production; analysing, values and ethics.
- 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.

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

- 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.

In the core knowledge section of the GCSE course you will learn about the following topics:

The impact of new and emerging technologies and how these can affect people's lives and the environment

- How to evaluate new and emerging technologies that can inform design decisions
- Different forms of energy generation, storage and knowing how to choose the appropriate source
- Smart and composite materials, and technical textiles
- Mechanical devices used to produce movement
- Electronic systems
- Programmable components
- Categorisation of ferrous and non-ferrous metals
- Papers and boards
- Thermoforming and thermosetting polymers
- The categorisation of fibres, and textiles
- Natural and manufactured timbers

- All design and technological practice takes place within contexts which inform outcomes
- Challenges that influence the processes of design and making
- Investigate and analyse the work of professionals and companies to inform design
- Using different design strategies
- Using communication techniques to present design ideas

In the specialist material area of Systems, you will learn about the following topics:

Design contexts

- Properties and origins of components
- Selection of components
- The impact of forces and stresses on objects
- Stock forms of components
- Manufacturing processes
- Processes for fabricating a prototype
- Surface finishes and treatments

In the specialist material area of Timbers, you will learn about the following topics:

- Design contexts
- Sources of timber
- Selection of timber
- Strengthening timber
- Stock forms and sizes
- Manufacturing processes
- Equipment and processes used to make prototypes
- Surface treatments and finishes for functional and aesthetic purposes

How does your study of Design and Technology support your study in other subjects?

Math skills are fundamental to design and technology. These skills will be embedded in the examination for this qualification. Science skills, knowledge and understanding underpin the theory and practice of design and technology. These skills will be embedded in the examination for this qualification. In addition to maths and science, the GCSE in Design and Technology embeds knowledge, techniques and practices from a wide range of subjects, including art and design, business, computer science and geography. As part of the teaching of the qualification, students gain an awareness and appreciation of the ways in which these subject areas relate to and inform decisions in design.

How can students deepen their understanding of Design and Technology?

Students may have the great opportunity of visiting relevant, interesting and inspiring organisations such as the Jaguar/Land Rover manufacturing plant in Solihull, where they get to see vehicles being built by robotics. This enables students to see how products are manufactured in industry. In addition, any opportunities for students to have meaningful employer engagement opportunities are critical. Students can also strengthen their subject knowledge and practical skills by attending enrichment sessions that run throughout the course. There are great websites that can also further their knowledge within the subject, these are BBC Bitesize and Technology Student.

How are you assessed in Design and Technology?

There are 6 assessment points each year that we term Praising Stars©. We assess how students at their current stage of study are on track to reach their end of stage targets which are formulated on aspirational expectation from their Key Stage 2 starting points. For younger years we base our assessment on our subject mapping of the age-related expectations across the curriculum, assessing students' performance at their current stage of study against expectation. In GCSE students are assessed using the following assessment objectives (AO 1-4), which form the basis of assessment at GCSE. At GCSE we make informed predictions from our holistic assessments based on our subject mapping of expectation across the Edexcel GCSE (9-1) Design and Technology curriculum, their progress against the key assessment objectives and their aspirational GCSE targets. These are also the basis for any appropriate support and intervention.

Key Assessment Objectives for Design and Technology GCSE:

AO1 – 10%

- Identify, investigate and outline design possibilities to address needs and wants –

AO2 – 30%

- Design and make prototypes that are for purpose

AO3 – 20% - Analyse and evaluate -

- Design decisions and outcomes, including for prototypes made by themselves and other
- Wider issues in design and technology

AO4 – 40% - Demonstrate and apply knowledge and understanding of:

- Technical principles
- Designing and making principles

How can Design and Technology support your future?

Of course we offer the study of Key Stage 3 and Key Stage 4 Design and Technology and we encourage 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 your study of Design and Technology into GCSE or not you will have gained access to this enriching subject and its study will have taught you to think differently and deeply.

The very fact that Design and Technology develops such a wide range of transferable skills such as problem solving, organisation, communication, creativity, business management, analytics, and discipline, these transferable skills will help your future application be they for colleges, universities, apprenticeships or employment.

There are a variety of courses at a range of universities where you can continue your study in this area. For example, some popular courses include; Design and Technology, Product Design and Technology, Product Design and Craft, Fashion Design and Technology, as a single honours or a joint honours subject studied alongside other disciplines.

Design and Technology fulfil a wide range of careers;

- CAD CAM Software Engineer
- Mechanic
- Designer
- Carpenter
- Teaching
- Machine technician
- Civil Engineering
- Architecture
- Plumbing
- Robotic technician
- Building trade
- Health and safety/environmental supervisor
- Model maker
- Interior designer

- Quality control/assurance technician
- Silversmith

Curriculum Planning

DESIGN AND TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW –

The Design and Technology course at Key Stage 3, provides students with the necessary skills and knowledge to access the various routes available at Key Stage 4. It also provides an environment for students to learn through the practical application, allowing for creative solutions to real, complex problems. Fundamentally, the early years key stage 3 projects allow students to access and refine the skills needed to study at Key Stage 4, which is taught over a two year period. All lessons are to be taught by specialist teachers, but this can change depending on how the timetable has been structured.

Assessment

Assessment Objectives Design and Technology

	Design	Make	Evaluate	Technical Knowledge
KS 4	<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>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>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>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>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>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>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 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>
Y9	<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>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>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>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</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 and determine which should take priority.</p> <p>Consider additional factors such as ergonomics and anthropometrics.</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 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>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>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>
Y8	<p>Use research and begin to exploration, such as the study of different cultures, to identify and begin 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. 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. 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 manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</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>How to apply computing and use electronics to embed intelligence in products that responds to inputs.</p> <p>How to control outputs such as actuators and motors.</p> <p>How to use software and hardware to develop programmes and transfer these programmable components for example, microcontrollers. 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, and how they can be used to advantage.</p>

	<p>Consider additional factors such as ergonomics and anthropometrics.</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>	
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 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>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 e.g. 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>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>

Assessment Objectives Cooking and Nutrition

Key Stage 3 Programmes of Study for cooking and nutrition Key messages, advice and explanatory notes (1-8) for schools	AO1: Understand health and safety relating to food and cookery (Explanatory note 2)	AO2: Understand and apply the principles of nutrition and health (Explanatory notes 1 and4)	AO3: Understand the source, seasonality and characteristics of a broad range of ingredients (Explanatory notes 5,7and8)	AO4: Understand factors relating to food choice (so that they are able to feed themselves and others a healthy and varied diet). (Explanatory note 3 and6)	AO5: 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) (Explanatory note 2)
KS4	Be able to explain food safety legislation and the role of the Environmental Health Officer. Know and understand the HACCP system and the purpose for food businesses.	Be able to analyse and evaluate diets and make recommendations for improving nutritional profile. Be able to calculate energy and nutritional content of recipes Be able to explain health risks of an unbalanced diet and give sound nutritional advice on how to improve it.	Know and understand how cooking methods affect the nutritional content of dishes Know and understand why and how food is cooked and the chemical and physical changes that occur.	Know and understand how medical conditions determine food choices: Cardiovascular, obesity, bone health, dental health, type 2 diabetes, iron deficiency anaemia bowel disorders, allergies and intolerances.	Learners are able to organise their time, dovetailing planning to produce more than one complex dish in the time available. They are able to use equipment, including electrical equipment, with confidence. They are able to use presentation and food styling techniques independently. Be able to accurately portion foods.
Year 9	Know and understand the factors that affect bacterial growth and their control (including temperatures) Know and understand the main causes of food contamination and the steps that need to be taken to prevent food poisoning.	Know and understand the causes and effects of an unbalanced diet and understand how to amend and develop a recipe to suit nutritional needs of individuals.	Know and understand how processing affects the physical, sensory and nutritional properties of foods.	Know and understand how economic factors determine food choices and nutritional health: High and low budgets effects of food poverty Know how to make informed choices about food from packaging and labelling.	Learners continue to develop their food preparation and cooking skills making complex dishes that meet the needs of users They are able to follow recipes independently. They are developing presentation and styling techniques.
Year 8	Know and understand how to identify risks (food poisoning, cross	Know and understand how nutritional requirements differ for specific groups of people	Know and understand how ingredients have different effects in a recipe and be	Know and understand the range of cultural and ethical	Learners will make dishes of increasing complexity that further develop their food preparation

	<p>contamination) and minimise hazards in the cooking environment.</p> <p>Know and understand the difference between use by and best before dates)</p> <p>Know and understand the principles of safe storage, cooking and reheating foods.</p>	<p>(Life stages, allergies and intolerances).</p> <p>To understand how nutritional information and allergy advice on food packaging can be used to help make healthy choices (traffic lights).</p>	<p>able to describe the sensory, nutritional and physical functions of ingredients in recipes.</p>	<p>factors that determine food choices:</p> <p>Religion Vegetarian/vegan Fair trade Animal welfare Advertising/marketing.</p>	<p>and cooking skills and use a range of commodities.</p> <ul style="list-style-type: none"> -Making/shaping doughs -Sauce making - Blending - Frying -Whisking -Seasoning -Test for readiness
Year 7	<p>Know and understand safe and hygienic working practices and the practical steps they can take to remain safe and hygienic.</p> <p>Know and understand safe preparation, usage, cleaning and storage of utensils and equipment</p>	<p>Know and understand what is meant by a balanced diet using the current UK dietary recommendations (Eatwell guide and 8 Tips)</p> <p>Know the sources and understand the functions of the nutrients that make up a balanced diet</p> <p>Know and understand the importance of exercise and energy balance in maintaining a healthy weight.</p>	<p>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)</p> <p>know and understand that foods come from a range of sources (caught, reared, grown).</p> <p>Know and understand that raw ingredients are processed to create food products (primary, secondary processing)</p>	<p>Know and understand the range of social and environmental factors that determine food choices:</p> <p>Personal/family preference Availability (seasonal/locality) Food miles Organics Food waste Packaging and recycling</p>	<p>Learners will be able to demonstrate a range of basic food preparation and cooking skills using a variety of food commodities</p> <ul style="list-style-type: none"> -Weighing/measuring -Knife skills (bridge/ claw) -Peeling - Segmenting -Boiling/ simmering -Rubbing in -Creaming/ all-in-one - Melting - Folding - Baking

Assessment Grids – Age Related Assessment Descriptors

Design and Technology

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 user.</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 resources consumption on the planet and measure taken to improve this.</p> <p>I can implement 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 users 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. 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. 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. I understand the responsibilities of designers and engineers and clearly show this in my work.</p> <p>This could include, inclusive design, sustainability etc. 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 respond to inputs, and control 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 users 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 analyse research to write a full specification which include users views/needs.</p>	<p>I can describe the tools and equipment I use. I can describe a range of materials that I use.</p> <p>I can describe the processes that I use. My work is generally accurate and pay attention to quality of finish.</p> <p>I always work safely adhering to workshop safety rules.</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 negative impacts that</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 respond to input and controls outputs.</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>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>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 how CAD/CAM in design and manufacture of my product (identify between 2D and 3D).</p>
<p>Developing <i>Working towards ARE</i></p> <p>(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. I use different methods to develop and improve ideas e.g. CAD/Modelling. 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. 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. 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. I can outline what I designed and what I made and state improvements needed. 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. I know how CAD/CAM can be used in manufacture.</p>

Assessment Objective	Design AO1	Make (Include Hands) AO2	Evaluate AO3	Technical Knowledge AO4
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(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
<p>Excelling <i>Working well above ARE</i></p> <p>(Trajectory for Grade 8 – 9)</p>	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.
<p>Exceeding <i>Working beyond ARE</i></p> <p>(Trajectory for Grade 6 – 7)</p>	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 the 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 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>(Trajectory for Grade U – 1)</p>	<p>I can prepare myself and my work area for practical work. I can use and clean basic equipment safely. I can identify which foods need to go in the fridge.</p>	<p>I can classify foods using the Eatwell guide. 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)</p>	<p>I can name some food commodities (cereals, fruit, vegetables, meat, fish, eggs, fats/oils, milk/dairy food products) I can identify whether foods are caught, reared or grown. I can identify foods that are primary processed and secondary processed.</p>	<p>I know that people choose food based on likes/dislikes. I can identify a range of UK seasonal produce. I know can identify a range of imported foods including Fair Trade products.</p>	<p>I can prepare and cook a recipe following teacher demonstrations and with support. I can identify and select the correct equipment for the task with guidance.</p>

Assessment Objective	AO1 Health and Safety	AO2 Nutrition and Health	AO3 Source, Seasonality and Characteristics of Ingredients	AO4 Food Choice	AO5 Cooking Skills
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(Assessment Objectives refer to Design and Technology Programmes of Study)

Please refer to specific course pages for the courses we teach in our academy. They will provide an overview of the course and how it is assessed and also give an outline of how the study takes place over the two years.

