Design Technology Policy

Whitefriars School

Approved by:	**SLT**
Effective from:	**September 2022**
Review date:	**September 2022**
Next Review Date:	**July 2023**

Intent

Article 29: *Your right to become the best that you can be.*

The pupils will be guided to design their own products by researching user needs and designing specifications to match these. They will learn how to use specialist tools, techniques, and processes to make these products and test and evaluate them by considering the views of intended users. The pupils will develop their knowledge, understanding of food preparation and nutrition and will advance their cooking skills.

The pupils will develop the creative, technical and practical expertise needed to perform everyday tasks confidently. They will build and apply a variety of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users. They will critique, evaluate and test their ideas and products against design specifications and criteria.

The pupils will develop interest, enthusiasm and curiosity for Design and Technology. They will acquire an understanding of nutrition and apply the principles of nutrition and learn how to cook. They will become critical and reflective thinkers with enquiring minds. The pupils will learn to ask relevant questions about their designs and products and think critically about the answers. The curriculum ensures that pupils will know and remember the key information studied.

Implementation

Article 28: *Your right to learn and go to school.*

Skills and content

In the curriculum the pupils learn about a variety of practical skills through various Design Technology projects. The order of these projects and the structure of this curriculum has been designed to allow for sequential skill development. Our through school curriculum follows the design, make and evaluate steps at each keys stage whilst continually developing new technical skills throughout. In doing so pupils learn how key events and individuals in design and technology have helped shape the world.

The pupils learn a variety of practical skills covering Resistant Material, Textiles, Food Prep and Nutrition. These develop through the whole school, from the beginning of the primary section to the end of the secondary section. The part of the skill taught in each year group and each stage is well-designed and based on the through-school approach. Secondary section teaching is fully integrated with and builds upon the development of skills in the primary section.

Our curriculum fully embraces and meets all the requirements of the National Curriculum and the Statutory Framework for the Early Years Foundation Stage and enhances this according to the needs of our pupils. Regular planning sessions ensure coverage is thorough.

Timetable

In the primary section, pupils complete a variety of Design Technology topics. Bespoke DT/Art lessons take place every fortnight.

In Key Stage 3 pupils have bespoke Design Technology lessons. Pupils have one timetabled lesson per week in Years 7, 8 and 9 (usually a double lesson).

Pupils have the option of studying Design Technology and/or Food and Nutrition at GCSE level in Years 10 and 11. These pupils have three lessons per week.

EYFS

In EYFS, pupils make imaginative and complex 'small worlds' with blocks and construction kits, exploring and joining different materials and textures to use to express their ideas. They also learn to make healthy choices about food and drinks.

Key Stage 1

In Key Stage 1, pupils learn to design and make purposeful, functional, appealing products for themselves and others based on design criteria. They generate, develop, model and communicate their ideas in a variety of ways. They make their products using a range of tools, materials and equipment. They explore and evaluate existing products and evaluate their ideas and products against design criteria. They build structures and explore and use mechanisms in their products. Pupils use the basic principles of a healthy and varied diet to prepare food and understand where food comes from.

Key Stage 2

In Key Stage 2, pupils learn to use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at individuals or groups. They further develop their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, and more. They continue to make their products using a wider range of tools, materials, equipment and components. They investigate and analyse a range of existing products and evaluate their products and ideas against their own design criteria, considering other opinions and views to improve their work. They apply their technical understanding to reinforce more complex structures and use mechanical and electrical systems in their products as well as applying their understanding of computing to program, monitor and control their products. Pupils continue to apply the principles of a healthy and varied diet, including preparing and cooking a variety of savoury dishes, understanding seasonality, and knowing where ingredients are grown, reared, caught and processed.

Key Stage 3

The curriculum fully builds on the primary section curriculum and continues the sequential approach to the development of skills.

Pupils use exploration to understand user needs. They identify and solve the resulting design problems and develop specifications to respond to these needs. A variety of design

approaches are considered to avoid stereotypical responses. These ideas are communicated using sketches, plans and presentations. Pupils select and use specialist machinery together with a range of materials to make their products. Materials chosen are based on an understanding of properties. Pupils evaluate, test and refine their ideas against a specification. In doing so they gain an increasing level of technical knowledge relating to mechanical systems, electronic systems and the use of electronics to embed intelligence in products.

In key Stage 3, pupils enhance their understanding and application of the principles of nutrition and health. They cook a repertoire of savoury dishes and in doing so become competent in a range of cooking techniques. They learn about the source, seasonality and characteristics of a broad range of ingredients.

GCSE and A-Level

The curriculum has been designed so that Design Technology teaching at GCSE and A-level fully develops from that taught in the earlier key stages. As such pupils are fully prepared for this higher level of study. GCSE and exam boards provide a lot of choice for schools regarding the content to be covered. The modules chosen reflect the needs and interests of our pupils as well as being fully integrated in our whole school curriculum. The modules taught include the learning of new advances in Design as well as developing further understanding of previously taught concepts.

Extra-Curricular

There are a variety of STEM activities and clubs which are open to all pupils. There is a sewing club open to primary section pupils. KS4 pupils visit the Design Museum and food tasting festivals to deepen and enrich their learning. Workers within the design industry also visit the school to run workshops for pupils. Chefs visit the school to assist and inspire GCSE Food Preparation pupils.

Implementation - Skills

	Design	Make	Evaluate	Technical knowledge	Cooking and Nutrition
Nursery	Develop ideas and then decide which materials to use to express them	Use large and small motor skills to do things independently Use one handed tools and equipment and show a preference for a dominant hand Select and use activities and resources, with help when needed Make imaginative and complex 'small worlds' with blocks and construction kits	Talk about patterns around them Talk about problems and how they can solve them	Explore how things work Build independently with a range of appropriate resources Join different materials and explore different textures Combine shapes to make new ones	Make healthy choices about food and drink
Reception	Think ahead about how they will explore or play with objects	Develop small motor skills so they can use a range of tools competently, safely and confidently Combine shapes to make new ones	Show resilience and perseverance in the face of challenge.	Solve real problems Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.	Know and talk about the different factors that support their overall health and wellbeing: healthy eating
Year 1	Design products that have a clear purpose and an intended user Explore objects and identify likes and dislikes of the designs Communicate their ideas through talking and drawing	Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Evaluate their ideas and products Suggest improvements to existing designs	Build basic structures Explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products	Use the basic principles of a healthy and varied diet to prepare dishes Understand where food comes from
Year 2	Design purposeful, functional, appealing products for themselves and other users based on design criteria Generate, develop, model and communicate their ideas through talking and drawing	Disassemble simple products to understand how they work Use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	Build structures, exploring how they can be made stronger, stiffer and more stable Explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products	Cut, peel or grate ingredients safely and hygienically Measure or weigh using measuring cups or electronic scales Understand where food comes from
Year 3	Design with purpose by identifying opportunities to design. Explore objects and identify likes and dislikes of the designs	Disassemble products to understand how they work. Use basic material to complete practical task Use basic tools and equipment to perform practical tasks	Refine work and techniques as work progresses, evaluating the product design. Suggest improvements to existing designs Explore how products have been created	Understand how gears and pulleys work Understand the terms circuits, switches, bulbs, buzzers and motors	Prepare ingredients hygienically using appropriate utensils. Assemble or cook ingredients
Year 4	Design with purpose by identifying opportunities to design. Use software to design and represent product designs Generate a selection of design ideas	Disassemble products to understand how they work Use a range of tools and material to complete practical task	Refine work and techniques as work progresses, continually evaluating the product design	Understand the terms circuits, switches, bulbs, buzzers and motors Understand how simple mechanical system work (for example, gears, pulleys, cams, levers and linkages	Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram Assemble and cook ingredients (controlling the temperature of the oven or hob, if cooking)
Year 5	Design with the user in mind, motivated by the service a product will offer Create innovative designs that improve upon existing products Use designers work to help generate ideas for designs	Ensure products have a high-quality finish, using art skills where appropriate Make products through stages of prototypes, making continual refinements Use a selection of tools and material to complete practical task.	Analyse a range of existing products Evaluate their ideas and products against their own design criteria	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] Understand and use of basic mechanical systems in their products.	Understand the importance of correct storage and handling of ingredients (knowledge of micro-organisms) Demonstrate a range of baking and cooking techniques
Year 6	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Generate design ideas and communicate them through discussion, annotated sketches, cross-sectional, exploded diagrams, prototypes, pattern pieces and computer-aided design	Use a wide range of tools and equipment to perform practical tasks accurately, for example, cutting, shaping, joining and finishes. Select materials according to their functional properties and aesthetic qualities	Evaluate the design of products to suggest improvements to the user experience Investigate and analyse a range of existing products Understand how key events and individuals in design technology have helped shape the world	Understand and use mechanical systems (for example, gears. pulleys, cams, levers and linkages) Apply their understanding of how to strengthen, stiffen and reinforce more complex structures	Measure accurately and calculate ratios of ingredients to scale up or down from recipe. Create and refine recipes, including ingredients, methods, cooking times and temperatures Understand seasonality, and know where and how a variety of ingredients are grown and reared
Year 7	Use research and exploration, to identify and understand user needs. Develop a basic specification Generate creative ideas and communicate these by using basic annotated sketches	Use a range of tools and equipment and operate them safely Use a range of materials to make a product	Analyse the work of past and present professionals Evaluate and refine design ideas	Understand the properties of different types materials Understand how mechanical systems can be used in their products	Cook basic dishes so that they are able to feed themselves and others Use a range of cooking techniques Understand the term seasonal foods and know how a variety of ingredients are grown and reared
Year 8	Use research and exploration, such as the study of different cultures, to identify and understand user needs Identify and solve design problems. Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations Use a variety of approaches to generate ideas.	Use a range of tools and equipment and operate them safely a precisely Use a range of materials considering their properties	Evaluate and refine design ideas against a specification Understand developments in design and technology, its impact on individuals, society and the environment.	Understand and use the properties of materials and the performance of structural elements. Understand how mechanical systems can be used in products.	Understand and apply the principles of nutrition and health Cook a variety of dishes so that they are able to feed themselves and others a healthy and varied diet Cook using a range of methods Using awareness of taste, texture and smell to decide how to season dishes Understand the source, seasonality and characteristics of a broad range of ingredients
Year 9	Use research and exploration, such as the study of different cultures, to identify and understand user needs Identify and solve design problems Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations Use a variety of approaches to generate creative ideas Develop and communicate design ideas using annotated sketches.	Use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture Use complex range of materials considering their properties	Analyse the work of past and present professionals. Investigate new and emerging technologies Test, evaluate and refine their ideas and products against a specification, considering the views of intended users. Understand developments in design and technology, its impact on individuals, society and the environment.	Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions Understand how more advanced mechanical systems can be used in products to enable changes in movement and force	Understand and apply the principles of nutrition and health Cook a range of dishes so that they are able to feed themselves and others a healthy and varied diet Use a range of cooking techniques to prepare dishes Using awareness of taste, texture and smell to decide how to season dishes
Year 10	Use research to understand design possibilities and show an understanding of the problems/opportunities. Identify a user/client that is mostly relevant to the design brief Develop a design specification with justification linking to the needs and wants of the client/user. Develop a range of ideas. freehand sketching, isometric and perspective 2D and 3D drawings	Use tools, materials and equipment (including CAM where appropriate) safely and precisely showing a good level of skill. Evaluation throughout the project to ensure the product matches the design brief and specification.	Analyse the work of past and present professionals Test most aspects of the final prototype against the design brief and specification.	Forces and stresses Ecological and social footprint Stock forms, types and sizes Scales of production Specialist techniques and processes Surface treatments and finishes.	Food, nutrition and health Food science Food safety Food choice Food preparation skills
Year 11	Use research to fully understand design possibilities and show a good understanding of the problems/opportunities. Identify a user/client that is mostly relevant to the design brief Develop a detailed design specification with good justification linking to the needs and wants of the client/user. Develop a range of Imaginative ideas. Investigation, primary and secondary data Exploded diagrams to show constructional detail or assembly	Use a selection of tools, materials and equipment (including CAM where appropriate) safely and precisely showing a high level of skill. Evaluation throughout the project to ensure the product matches the design brief and specification. Understand how to select and use specialist techniques and processes appropriate for the material and/or task.	Analyse the work of past and present professionals. Test all aspects of the final prototype against the design brief and specification Understand new and emerging technologies	Ecological and social footprint measurement/reference points, templates, jigs and patterns where suitable. Environmental, social and economic challenge	Food preparation skills Environmental impact and sustainability of food Food processing and production Sensory evaluation

Implementation – Content

Article 13: *Your right to have information.*

	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Nursery					What small world could I create?	What do I want to eat and drink?
Reception		How can I create an emergency vehicle?	What tools do I need to create a rocket?		How can I improve my minibeast model?	
Year 1		How can a puppet be created?		How can a wind buggy be created?		Where does food come from?
Year 2	How can a pencil case be created?		How can a Ferris wheel be created?			How do you prepare a healthy wrap?
Year 3		How can a cushion be created?		What makes a healthy pizza?	How can a toy be created using a pneumatic system?	
Year 4	How can a volcano be created using recycled materials?	How can a slingshot be created?		How can a circuit be used to create a greetings card?	Is precision important when following a recipe?	
Year 5	How can a stuffed toy be created?	How can a sturdy bridge be constructed?			What could be healthier?	
Year 6		How can a game be created using electrical circuits?			How can a costume be created?	How do you create a three-course meal?
Year 7	Textiles -Monster Dolls	Textiles -Monster Dolls	Food Prep and Nutrition	Food Prep and Nutrition	Product Design- Note Holder	Product Design- Note Holder
Year 8	Food Prep and Nutrition	Food Prep and Nutrition	Textiles – Pop Art Project	Textiles – Pop Art Project	Product Design- Memphis Clocks	Product Design- Memphis Clocks
Year 9	Textiles – Wristband Project	Textiles – Wristband Project	Product Design- Box Project	Product Design- Box Project	Food Prep and Nutrition	Food Prep and Nutrition
Year 10		Core Principles		Specialist Techniques		
Year 11		NEA Coursework		Designing and Making principles		

Implementation – GCSE Design Technology (AQA)

Component title	Content Overview
Written examination 50% 2 hours written paper	**Core technical principles** A mixture of multiple choice and short answer questions assessing technical knowledge and understanding. This includes new and emerging technologies, energy generation and storage, developments in new materials, systems approach to designing, mechanical devices and materials and their working properties. **Specialist technical principles** Several short answer questions and one extended response to assess technical principles. This includes how to select materials, forces and stresses, ecological and social footprint and how to use various materials. **Designing and making principles** A mixture of short answer and extended response questions regarding environmental, social and economic challenge, design strategies, prototype development and specialist tools and equipment.
Prototype and portfolio of evidence 50% 30 to 35 hours in total Non-examined module	Your prototype and portfolio of evidence will require you to: • Identify and investigate design possibilities • Produce a design brief and specification • Generate design ideas • Develop design ideas • Produce a design idea • Analyse and evaluate your prototype

Implementation – GCSE Food Preparation and Nutrition (AQA)

Component title	Content Overview
Written examination 50% One hour written paper	• Food, nutrition and health • Food science • Food safety • Food choice • Food provenance
Electronic report 50% Task 1: 10 hours Task 2: 20 hours Non-examined module	**Task 1:** Food Investigation You will write an electronic report, including photographs, of a practical investigation. This will show your understanding of the functional and chemical properties of ingredients. This will be 1500-2000 words long. **Task 2:** Food Preparation Assessment You will prepare, cook and present a menu of three dishes within a single period of no more than 3 hours. You will fully plan how this will be achieved and present this project in a portfolio.

Impact

Teacher guiding of first practise supports pupils with new knowledge and skills when they first use it and ensures that misconceptions are immediately rectified. Pupils are targeted for guiding based on the assessment information gleaned from lesson questioning and distance feedback.

Learning tasks are differentiated so that pupils focus on their precise next steps and practise what they most need to practise. Distance feedback, questioning and guiding allows the teacher to glean the assessment information necessary to plan this.

Teacher questioning about and after all explanations, using techniques to ensure that all pupils are included in the questioning, allows the teacher to assess the level of understanding of their teaching. This allows future explanations to be planned during lessons. This keeps pupils at the point of learning.

Teachers monitor and track the achievement of skills learning of content to plan accordingly.

Secondary section teachers complete class feedback logs to provide distance feedback. These identify individual, group and whole class misconceptions which are used to plan the next lesson's explanations, questioning, next steps and guided group.

Questioning, live tweaks to explanations, teacher guiding, a focus on next steps and class feedback logs all ensure that any knowledge or skill gaps are immediately closed so that pupils have the key information needed for subsequent learning, lessons and examinations.

Year 10 and Year 11 pupils complete an assessment or examination each half term. These assessments match final examination criteria and generate working at grades for the pupils for that particular content. This assessment, combined with ongoing teacher assessment and professional judgement is used to generate half termly predicted grades. Predicted grades are the Design Technology department's judgement as to the grades pupils are most likely to achieve in the final GCSE and A-level as a result of the 50/50 combination of NEA coursework and examinations.