KS1-KS2 DT Objective Overview (22-23)

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts.

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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	• Begin to explore how products have been created • Design products that have a clear purpose and an intended user with support • Make a simple diagram to show a design • Develop design criteria with a group	• Explore how products have been created • Design products that have a clear purpose and an intended user • Use software to design • Make diagrams to show a design • Develop own design criteria	• Show that a design meets a range of requirements • Put together a plan which shows the equipment and tools needed • Describe a design using an accurately labelled diagram	• Design with purpose by identifying opportunities to design • Create cross-sectional diagrams to demonstrate own design	• Identify a range of ideas after collecting information taking a user's view into account when designing • Produce a detailed step-by-step plan • Use cross sectional planning to show a design • Produce prototypes to show ideas	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit) • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs • Create innovative designs that improve upon existing products
Make	• Cut safely using tools provided • Demonstrate a range of cutting and shaping techniques such as tearing, cutting and folding • Demonstrate a range of joining techniques such as gluing and combining materials to strengthen • Begin to join textiles using running stitch • Colour and decorate textiles using techniques such as dying or adding sequins • Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products • Begin to create products using levers, wheels and winding mechanisms • Begin to refine the design as work progresses • Begin to choose the right materials for making a product according to the properties needed	• Cut materials safely using tools provided • Measure and mark out to the nearest centimetre • Demonstrate a range of cutting and shaping techniques such as tearing, cutting, folding and curling • Demonstrate a range of joining techniques such as gluing, hinges, or combining materials to strengthen • Join textiles using running stitch • Colour and decorate textiles using a number of techniques such as dying, adding sequins or printing • Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products • Create products using levers, wheels and winding mechanisms • Make products, refining the design as the work progresses • Choose the right materials for making a product according to the properties needed	• Use a range of tools and equipment accurately • Measure, mark out, assemble and join materials and components with some accuracy	• Cut materials accurately and safely by selecting appropriate tools • Measure and mark out to the nearest millimetre • Understand the need for a seam allowance • Join textiles with appropriate stitching • Make products by working efficiently (e.g. by carefully selecting materials)	• Cut materials more accurately • Measure and mark out accurately to the nearest millimetre • Ensure product has a seam allowance • Join textiles efficiently using a simple stitch • Use a range of tools and equipment expertly	• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape) • Create objects that need a seam allowance • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decorations)
Evaluate	• Begin to explore objects to identify likes and dislikes of the designs • Begin to suggest improvements to existing designs • Evaluate a design or product against given design criteria • Begin to show an understanding of how historical events or people have helped shape the technological world today	• Explore objects to identify likes and dislikes of the designs • Suggest improvements to existing designs • Evaluate a design or product against design criteria • Talk about how historical events or people have helped shape the technological world today	• Look at products and talk about how they work • Practise evaluation skills by evaluating existing products • Evaluate own products • Suggest a change that could be made to improve a product	• Disassemble products to understand how they work • Refine work and techniques as own work progresses, continually evaluating the product design • Improve upon existing designs, giving reasons for choices • Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs •	• Test and evaluate own final product • Evaluate the design to suggest improvements, considering the materials and methods that have been used • Evaluate the appearance and function against the original criteria • Practise evaluation skills by evaluating existing products against own set criteria • Explain why finished product is going to be of good quality • Explain how product will appeal to the audience • Think about the aesthetic qualities of final product • Think about the functionality of final products	• Make products through stages of prototypes, making continual refinements • Ensure products have a high quality finish, using art skills where appropriate • Evaluate the design of products so as to suggest improvements to the user experience • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices

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Technical Knowledge	• Begin to use understanding of materials and their properties to strengthen, stiffen or reinforce products • Develop an understanding of how to use mechanical systems like gears, pulleys, levers and linkages in designs and products • Develop an understanding of how to use simple electrical circuits that include switches and bulbs • Begin to develop knowledge of computing to program, monitor or control product	• Use own understanding of materials and their properties to strengthen, stiffen or reinforce products • Understand and use mechanical systems like gears, pulleys, levers and linkages in own designs and products • Understand and use simple electrical circuits that include switches, bulbs, buzzers or motors in own products • Use own knowledge of computing to program, monitor or control own product • Model designs using software	• Choose textiles for a purpose • Join textiles of different types in a different way • Explain how to join things in a different way • Think about how to make own product strong • Devise a template •	• Choose suitable techniques to construct products • Strengthen materials using suitable techniques • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut-outs) • Select appropriate joining techniques • Select the most appropriate techniques to decorate textiles • Create series and parallel circuits • Use scientific knowledge of the transferences of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears) • Control and monitor models using software designed for this purpose • Use software to design and represent product designs	• Choose appropriate tools to cut and shape and justify choices with knowledge (such as the nature of fabric may require sharper scissors than would be used to cut paper) • Begin to use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles • Begin to create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips) • Begin to develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding) • Begin to use innovative combinations of electronics (or computing) and mechanics in product designs • Write code to control and monitor models or products	• Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper) • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips) • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding) • Convert rotary motion to linear using cams • Use innovative combinations of electronics (or computing) and mechanics in product designs • Write code to control and monitor models or products
Cooking and nutrition	• Begin to talk about how to be healthy • Begin to show understanding of a varied diet • Show some understanding about where different foods come from • Cut, peel or grate ingredients safely and hygienically with some support • Begin to measure or weigh using measuring cups or electronic scales • Begin to assemble or cook ingredients • Show some understanding of safety when cooking ingredients	• Talk about how to be healthy • Show understanding of a varied diet • Talk about where different foods come from • Cut, peel or grate ingredients safely and hygienically • Measure or weigh using measuring cups or electronic scales • Assemble or cook ingredients • Show understanding of safety when cooking ingredients	• Choose the right ingredients for a product • Say what to do to be hygienic and safe • Use equipment safely • make sure that own product looks attractive • Describe how own combined ingredients come together	• Prepare ingredients hygienically using appropriate utensils • Measure ingredients to the nearest gram accurately • Follow a recipe • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking	• Understand the importance of correct storage and handling of ingredients • Begin to measure accurately and calculate ratios of ingredients to scale up or down from a recipe • Begin to demonstrate a range of baking and cooking techniques • Begin to create and refine recipes, including ingredients, methods, cooking times and temperatures	• Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms) • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe • Demonstrate a range of baking and cooking techniques • Create and refine recipes, including ingredients, methods, cooking times and temperatures

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END OF KEY STAGE 1 EXPECTATIONS

	Design	Make	Evaluate	Technical Knowledge	Cooking and Nutrition
Key Stage 1	• Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	• Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	• Investigate and analyse a range of existing products • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Understand how key events and individuals in design and technology have helped shape the world	• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program, monitor and control their products.	• Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from.
Key Stage 2	• Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	• Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	• Investigate and analyse a range of existing products • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Understand how key events and individuals in design and technology have helped shape the world	• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program, monitor and control their products.	• Understand and apply the principles of a healthy and varied diet • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.