

Knowledge Rich Curriculum for Design and Technology

<https://www.data.org.uk/for-education/primary/> *Used to form the rationale*

Design and Technology Rationale

This D&T curriculum is a knowledge rich curriculum. Knowledge, in the realm of D&T means knowledge not only of designers, engineers, manufacturers and their work, but of the D&T concepts that relate to their work shown in different products, how this affects the children's own use of materials and development of skills.

The curriculum is designed to enable children to learn by making connections between existing designers and their products, architects and their own work, which they evaluate and relate back to the works they have studied. This process is cyclical. For children following the curriculum, becoming informed about the subject discipline of D&T is a process that takes place alongside a growing love for the subject. Meaningful opportunities for critiquing existing products and their own are woven through the curriculum, giving children space to learn who they are as a designer, engineer or manufacturer.

Units of work in the KS2 curriculum focus on the cycle of design, make and evaluate, whilst gaining technological knowledge. The overall scheme of the curriculum provides for gradual progression in terms of skills, introducing the children to as diverse a range of materials, designs and technical knowledge as possible, through different contexts. It also provides for progression in terms of knowledge of different technical knowledge and disciplines within D & T. The curriculum allows for children to gain knowledge of how design and products have developed over time and through history, through the study of influential designers, engineers and manufacturers from local to global.

The structure of the planning also provides for progression in terms of critical analysis of others' designs and the necessary observation, exploration and evaluation needed for the children to create their own product. Activities children are directed to undertake in lessons are designed. Activities which involve investigating and evaluating existing products. Focused tasks in which children develop particular aspects of knowledge and skills. Designing and making activities in which children design and make 'something' for 'somebody' for 'some purpose'. Each unit of work covers each of the aims of the National Curriculum. The Curriculum Sequence of Learning explains how this is achieved, summarising for each year group what knowledge, skills and processes are covered. The Overview goes on to specify, in more detail, what artists, designers, architects, concepts and skills are covered in each unit. It is expected that evidence of the children's study will be recorded in sketchbooks which can include the work, or photographs of the work they produce each lesson. Sketchbooks may include written reflections on the work of other designers, engineers and manufacturers, as well as the children's written reflections on their own work. These activities are all provided for in lesson to lesson planning. It may also be beneficial to include the knowledge organiser, learning objectives and multiple-choice quizzes in the sketchbook, so that both children and teachers can easily identify progression in knowledge, process and application of skills.

NATIONAL CURRICULUM STATEMENT

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 to understand and apply the principles of nutrition and learn how to cook.

Key stage 2

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 [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

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

Make

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

Evaluate

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

Technical knowledge

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.

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Intent: Develop the creative, technical and practical expertise across school.

Implementation: At least one full Design, Make, Evaluate and Technical Knowledge unit per year group, with supplementary design, make and evaluate activities plotted within one other topic. Year 3-6 will do a supplementary Food Tech.

| Timetabling: PUZZLES TERM 3 Enterprise | Subject content and skills | Recurring themes, ideas and language (the ultimate role of the content) | Subject Rationale: what is this section doing within pupils' wider subject curriculum journey? What is it building on? For what later content does this section prepare? (the proximal role of the content) |
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| Year 3 | | | |
| Summer Bridges and Structures VARIOUS MATERIALS - Experience with differing materials LOCAL INFLUENTIAL ENGINEER: Brunel? Freedom bridge | Bridge building Knowledge: Joining Design - <i>-Generate ideas for a product, considering its purpose and the user/s Identify a purpose and establish criteria for a successful product. Plan the order of their work before starting Explore, develop and communicate design proposals by modelling ideas Make drawings with labels when designing.</i> Make: <i>Select tools and techniques for making their product Measure, mark out, cut, score and assemble components with more accuracy Work safely and accurately with a range of simple tools Think about their ideas as they make progress and be willing change things if this helps them improve their work Measure, tape or pin, cut and join fabric with some accuracy Demonstrate hygienic food preparation and storage Use finishing techniques strengthen and improve the</i> | Themes and Ideas 3D shapes and use of nets Vocab Woodwork Themes and Ideas Solving a local problem- bridges and structures. | Building on: KS1 Select from and use a range of tools Foundations of: Cooking in Year 4 Tudors Designing and Evaluating products in year 4 Wider Curriculum: Wisbech and local studies. Measuring Maths unit (White Rose) Shape |

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| | <p>appearance of their product using a range of equipment including ICT</p> <p>Evaluate their product against original design criteria e.g. how well it meets its intended purpose Disassemble and evaluate familiar products</p> | | |
| Year 4 | | | |
| <p>WOODWORK</p> <p>NATIONAL Influential Designer: UK Dyson</p> | <p>Knowledge Sustainable transport; creating bicycle trailers for deliveries.</p> <p>Design : <i>Generate ideas considering the purposes for which they are designing Make labelled drawings from different views showing specific features Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail Evaluate products and identify criteria that can be used for their own designs.</i></p> <p>Make: <i>Select appropriate tools and techniques for making their product Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques Join and combine materials and components accurately in temporary and permanent ways Use simple graphical</i></p> | <p>Supplementary Vocab</p> <p>Unfamiliar:</p> <p>Themes and Ideas Theme: Seasonality (year 3) Nutrition (KS1 and Year 3)</p> | <p>Building on: This also builds on children’s knowledge of nutrition from KS1 and Year 3.</p> <p>Foundations of:</p> <p>Wider Curriculum:</p> |

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| | <p><i>communication technique</i></p> <p>Evaluate: <i>Evaluate their work both during and at the end of the assignment Evaluate their products carrying out appropriate tests</i></p> | | |
| Year 5 | | | |
| <p>Summer Term</p> <p>TEXTILES 2020</p> <p>EUROPEAN INFLUENTIAL DESIGNER: Helly Hanson</p> | <p>Knowledge</p> <p>Design: <i>Generate ideas through brainstorming and identify a purpose for their product Draw up a specification for their design Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail Use results of investigations, information sources, including ICT when developing design ideas</i></p> <p>Make: <i>Select appropriate tools, materials, components and techniques Assemble components make working models Use tools safely and accurately Construct products using permanent joining techniques</i></p> <p><i>Sew using a range of different stitches, weave and knit</i></p> <p><i>Measure, tape or pin, cut and join fabric with some accuracy</i></p> <p><i>Make modifications as they go along</i></p> | <p>Themes and Ideas</p> <p>Vocab:</p> | <p>Building on: year 3 woodwork joins using 90 degree straight joints supported by card triangles.</p> <p>Foundations of: KS3 Woodwork objectives</p> <p>Wider Curriculum: Literacy (Book study), Science : pollination</p> |

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| | <p><i>Textiles: Pin, sew and stitch materials together create a product Achieve a quality product</i></p> <p>Evaluate: <i>Evaluate a product against the original design specification Evaluate it personally and seek evaluation from others</i></p> | | |
| Year 6 | | | |
| <p>Summer term -</p> <p>Phone cases</p> <p>Range of MATERIALS</p> <p>GLOBAL Influential DESIGNER: Steve Jobs and SUSAN KARE, MARISSA MAYER (Apple) Philip Emeagwalie (fastest computer ever)</p> | <p>SUMMER</p> <p>Design :<i>Communicate their ideas through detailed labelled drawings Develop a design specification Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways Plan the order of their work, choosing appropriate materials, tools and techniques</i></p> <p>Make <i>Select appropriate materials, tools and techniques Measure and mark out accurately Use skills in using different tools and equipment safely and accurately</i></p> <p><i>Food Tech: Weigh and measure accurately (time, dry ingredients, liquids) Apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens Cut and join with accuracy to ensure a good-quality finish to the product</i></p> | <p>Theme: Nutrition/healthy eating, Design/produce/evaluate a final product (Y3,4,5)</p> <p>Make and create tea-cups and candles</p> <p>Food - sandwiches and cakes</p> <p>Decoupage paper plates for food</p> <p>Bunting</p> <p>Vocab nutrition, weight, ingredients, unhealthy, healthy, Weight (g/kg), measure (ml, l), temperature, spread, cooling, grate, embellish, esthetics, annotated diagram, appearance, brittle/fragile, design, construct, evaluation, bunting, thread,</p> | <p>Building on: Foundations of: Wider Curriculum:</p> <p>We have chosen our products to link with the theme of the vintage summer fayre. We will hold a stall where we will be selling and using our creations.</p> <p>This unit will link to maths (e.g. weighing ingredients, ratio and proportion, fractions), English (e.g. creating menus, adverts invites), science (e.g. Animals including humans, states of matter, properties and changes of materials).</p> |

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| | <p>Evaluate <i>their</i> identifying strengths and areas for development, and carrying out appropriate tests Record their evaluations using drawings with labels Evaluate against their original criteria and suggest ways that their product could be improved</p> | <p>needle, material, swatches, cuttings, analysis</p> | |
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