



"We believe, we achieve, we succeed in God's family"

THANKFULNESS ● COMMUNITY ● COMPASSION ● TRUTHFULNESS ● COURAGE ● FORGIVENESS

Design & Technology Knowledge and Skills Progression Overview

"Strive for perfection in everything you do. Take the best that exists and make it better. When it does not exist, design it."

Sir Henry Royce, English engineer and car designer

Intent	Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At St Mary's C of E Primary School, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.
Implementation	<p>To ensure high standards of teaching and learning in Design and Technology, we implement a curriculum that is progressive throughout the whole school. Design and Technology is taught as part of a cross-curricular termly topic, focusing on the knowledge and skills stated in the National Curriculum. Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in an iterative process of designing and making. The children design and create products that consider function and purpose and which are relevant to a range of sectors (for example, the home, school, leisure, culture, enterprise, industry and the wider environment). At St Mary's C of E Primary School, we make use of the extensive grounds and outdoor learning areas when planning for the students. We are a Forest School provider and so we maximise opportunities to construct, build, trial, test and evaluate Design and Technology products outdoors. Children also transfer their knowledge and skills of gardening and growing vegetables in our vegetable patches. Cooking skills are also carried during the Forest School sessions, through the use of our fire circle and cooking utensils.</p> <p>When designing and making, the children are taught to:</p> <p>Design</p> <ul style="list-style-type: none"> • 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 diagrams, prototypes, pattern pieces and computer-aided design. <p>Make</p> <ul style="list-style-type: none"> • select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing, as well as chopping and slicing) accurately. • select from and use a wider range of materials, ingredients and components, including construction materials, textiles and ingredients, according to their functional properties, aesthetic qualities and, where appropriate, taste.

	<p>Evaluate</p> <ul style="list-style-type: none"> • 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. <p>A range of inclusive teaching and learning strategies will be used in every lesson to capture pupils' interest and to promote effective learning and progress for all children including those with Special Educational Needs (SEND) and disadvantaged pupils.</p>
Impact	<p>Within Design and Technology, we strive to prepare children to take part in the development of tomorrow's rapidly changing world. We aim to encourage children to become creative problem-solvers, both as individuals and as part of a team. Through the study of Design and Technology, children combine practical skills with an understanding of aesthetic, social and environmental issues, as well as of functions and industrial practices. This allows them to reflect on and evaluate present and past design and technology, its uses and its impact. Progress within DT is not formally measured on an individual level, but use of Insight's attainment statements for each year group allows staff to ensure that children are reaching levels of attainment expected for their age. Teacher's will assess pupils' understanding of topic linked vocabulary before and after a unit is taught, summative assessments will be captured from pupil discussions about their learning. Images and videos of their practical learning will be available of Seesaw. The biggest measure of the impact of our teaching will be our confidence that we are sending children off at the end of their Primary School journey with a diverse range of DT skills and knowledge and a passion for creativity and innovation in its many forms. Our children will be secure in their own ability to create a broad range of DT projects, and confident in the knowledge that everything they create is meaningful and valid, with the potential to bring joy to themselves and others. The impact of our DT teaching will be a legacy of children who possess initiative and innovation skills, alongside a drive to continue developing their creativity as part of a lifelong journey.</p>

National Curriculum Requirements

EYFS

During the Early Years Foundation Stage pupils explore and use a variety of media and materials through a combination of child initiated and adult led activities. Design and technology enables children to gain knowledge and understanding of their world. Design is not just about drawing, but about thinking. Creating a pizza or designing a new Lego structure require no drawing, but both involve some experience, some imagination and a willingness to change and modify ideas.

Children in EYFS have opportunities to learn to:

- Explore the textures, movement, feel and look of different media and materials.
- Respond to a range of media and materials developing an understanding that they manipulate and create effects with these.
- Use different media and materials to express their own ideas.
- Construct with a purpose in mind using a variety of resources.
- Develop skills to use simple tools and techniques competently and appropriately.

Select appropriate resources for a product and adapt their work where necessary.

ELG: Self-Regulation	ELG: Fine Motor Skills	ELG: Creating with Materials
Set and work towards simple goals, being able to wait for what they want and control their impulses when appropriate. Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions.	Use a range of small tools, including scissors, paint brushes and cutlery. Begin to show accuracy when drawing	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the processes they have used.

KS1

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 and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- purposeful, functional, appealing products for themselves and other users based on design criteria.
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.

Evaluate

KS2

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

<ul style="list-style-type: none"> • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria. <p>Technical knowledge</p> <ul style="list-style-type: none"> • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. • build structures, exploring how they can be made stronger, stiffer and more stable. 	<p>Evaluate</p> <ul style="list-style-type: none"> • 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 <p>Technical knowledge</p> <ul style="list-style-type: none"> • 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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Cooking & nutrition
As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

KS1	KS2
Pupils should be taught to: <ul style="list-style-type: none"> • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from. 	Pupils should be taught to: <ul style="list-style-type: none"> • 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.

Links with British Values and Personal Development
DT often originates from an idea or artefact and to develop a wider cultural awareness we explore our past heritage as well as investigate and use as our stimulus foods, textiles, pottery and sculptures from different cultures and periods of time.

- In Design Technology children develop an understanding of the importance of safety rules when using tools and accept that if these rules are not followed that there are consequences.
- Children are given the freedom to express themselves through design and the creation of a wide variety of products in Design Technology. They are also encouraged to evaluate both products from a range of times and cultures and their own and each other's. Children also learn to accept that the ideas of others may not be the same as their own but are equally valid.
- During Design Technology children are encouraged to take the views and opinions of others into account but still have the right to make their own choices. Lessons also encourage children to take turns when speaking and when working practically with others. Opportunities are presented for pupils to understand that it is not always possible or right to have their own way and understand the value of compromise.
- During DT lessons pupils are expected to listen to and consider the ideas and opinions of others even if they differ from their own. They are also expected to be able to take turns during discussions, resolve difficulties or make decisions, for example, when choosing materials for making a product.
- Through Design Technology the children learn to appreciate the ideas of others that are different to their own and that many great design ideas originate from other cultures.

The Path to Success

Step 5: Connect it...

Use DT across the curriculum to develop e.g. to plan and present ideas

High quality discussion and use of visual and other design e.g. its use in adverts, propaganda—links to PSHE, RE

Specific links to Art, Science, Forest School, PSHE (economic), Maths & Computing

Step 4: Develop it...

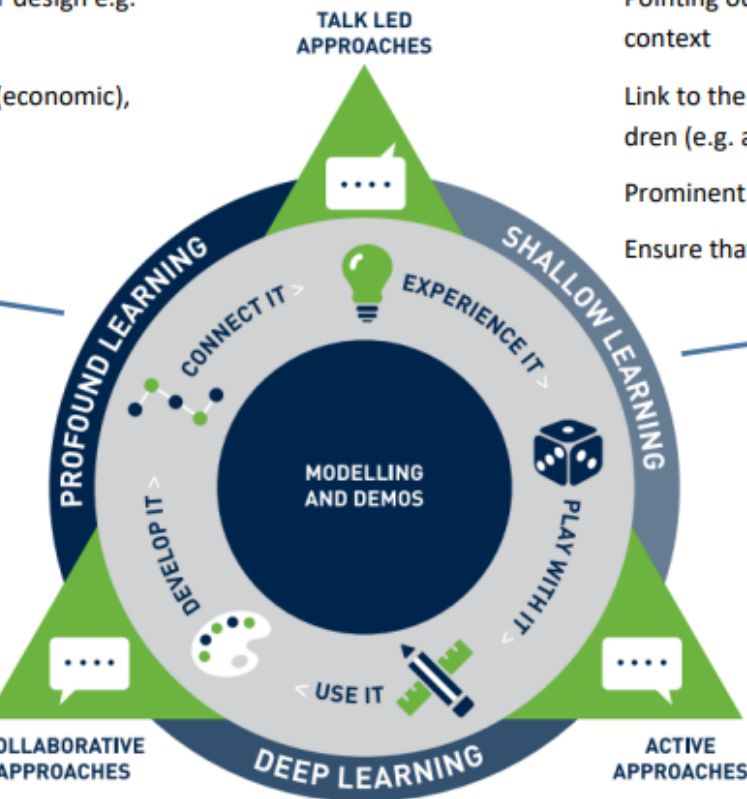
Collaborate!

Children discussing how DT skills can inform problem solving and creativity

Discuss DT in global industry and marketing and our responses to them

Use activities to enhance vocabulary application and use of DT-based language

Challenge—set tasks that require pupils to 'teach' about DT, or aspects of being a 'critical thinker'



Step 3: Use it...

Design as stimulus for work in other areas (Forest School, Maths, Science, Writing)

Regularity of opportunity—follow the curriculum structure

Evidence learning: pictures, posters, models

Step 1: Experience it...

Ensure children experience a rich context for design around the school e.g. displays, collective worship, wall hangings

Trips and visits involving designers, engineers, architects

Pointing out the engineering and design in the local area to give a context

Link to the design / technology that is mostly relevant for the children (e.g. apps, social media, films)

Prominent displays of work

Ensure that children have access to the technology that they need

Step 2: Play with it...

Chance to experiment as well as learning 'formal' techniques

Celebrating children's creativity

Word association games and follow-on play with vocabulary

Apply 'how could I respond to this situation?' (critical thinking; different perspectives)

Design 'flash' share something interesting from a DT perspective

Progression in Design & Technology

DESIGN

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plan	Plan	Plan	Plan	Plan	Plan
Make comments about what they are going to design or cook.	Give a brief overview of their plans for design or cooking, using some DT vocabulary.	Verbally explain their plans for design or cooking, linking to techniques and using DT vocabulary.	Explain their plans for design or cooking in some detail, and in writing, making reference to techniques and materials/ingredients.	Plan designs in detail with preliminary studies in sketchbooks, with reference to other designs and materials they have studied.	Plan in detail with payment and re-studies in sketchbooks, linking to what they have studied and explaining their choices.
Generate	Generate	Generate	Generate	Generate	Generate
Come up with ideas for a product, and express why they like it.	Make comments about the function and purpose of the product, and its personal appeal.	Refer to research while talking about their product.	Use research to justify the appeal of their product, and the innovativeness of their design.	Make comments about how they product might be altered to appeal to other groups.	Make sophisticated comments about the limitations of the function and purpose of the product with reference to different audiences
Draw	Draw	Draw	Draw	Draw	Draw
Trace around simple shapes to reproduce symbols. Precision level: simple shapes, freehand, colouring in is mostly within the lines.	Devise a simple diagram. Begin to annotate and highlight digital designs. Precision level: rectangles are accurate colouring in is within the lines.	Draw sketches at different points of the design process. Draw and annotate digital designs. Start to draw to scale. Start to draw 3-D projections, with shading for clarity. Precision level: accurate, 2-D shapes.	Draw a plan or sketch from a description. Draw a simple diagram without much guidance. Create a scale bar. Claire, productions of common 3-D shapes. Position level: careful with this position to avoid smudging.	Make an accurate design sketch from someone else's measurements and notes. Position level: consistency with oblique/perspective, projections of 3-D shapes.	
Develop	Develop	Develop	Develop	Develop	Develop
With support, discuss design criteria during the construction process	Start to volunteer comments about the design criteria while the construction process is ongoing.	Politely discuss their peers' work. Willingness to alter and/or restart designs.	Start to suggest how their peers can improve their work. Desire to alter and/or restart designs.	Make reasonable suggestions for how their peers might improve their work.	Constructively critique their peers' work and help with improvements if appropriate

MAKE					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Constructions with materials that are supplied for them	Select from materials that are supplied for them	Work creatively with a range of material, with some control	Request material or ingredients that have not been supplied	Request other material and give reasons	
Tools	Tools	Tools	Tools	Tools	Tools
Children's scissors Ruler / metre stick	Set square, soft tape-measure, knitting needles, crocheting sticks	Protractor, metallic tape measure, spirit level, sandpaper Screwdriver (supervised)	Compass Scissors (to score); adults scissors (to cut) Sewing needle, Stanley knife & glue gun (supervised)	Hammer, nails, chisel, mallet, vice (supervised)	Saw, power tools (supervised)
Measure	Measure	Measure	Measure	Measure	Measure
To nearest 10am (e.g. with stick painted in 5cm blocks)	To nearest cm and g Use litres and °C for temperature Scale in ones, twos, fives, tens (where the numbers are given)	To nearest mm, nearest 10ml, and 45° for angle Convert between units e.g. m to cm Use scales where numbers may be missing Make measurements on a computer design	Start to understand inches and miles, stone & pounds, Fahrenheit Measure non-rectilinear distances on a computer design	Angle to nearest ° Calculate area; start to understand volume Use approximate equivalences between metric and imperial Start using linear and area measuring tools on a computer design	Calculate area and volume Fluency with converting units, including between metric and imperial Accurate linear/area measuring tools on a computer
		Estimate	Estimate	Estimate	Estimate
		Start to estimate length and distance Start to understand area	Make reasonable estimations of length and distance; start to estimate mass, capacity and angle	Estimate length, distance, mass, capacity, angle; start to estimate temperature and area	Make reasonable estimations of length, distance, mass, capacity, angle, area and temperature

EVALUATE

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Simple evaluation. Follow simple advice from adults to improve their work.	Relate products to their design criteria. Listen courteously to views that differ from their own. Follow advice from adults or peers.	Link their own, and others', designs and products to their function and purpose. Start to verbalise others' opinions that differ from their own. Make choices about the following advice.	Verbalise others' opinions politely and consider following their advice. Start suggesting improvements to others designs. Link products to their cultural contexts.	Use constructive and sensitive language to suggest improvements to their peers' designs.	Analyse their own and others' responses to their design, making improvements if appropriate. Help improve peers' designs where that offer is welcomed.
Showcase work	Showcase work	Showcase work	Showcase work	Showcase work	Showcase work
Can refer to a photo or drawing while talking about their work. Use tallies and simple tables.	Use ICT to create a simple info sheet about their work. E.g. text with photo. Use pictograms, tally, charts, block diagrams.	Make and discuss annotated sketches and diagrams. Use bar charts, e.g. not blocks.	Make and discuss cross-sectional and exploded diagrams. Use time graphs; discrete and continuous data.	Create a presentation with text/images to support them in showcasing work. Use timetables; mode and range averages.	Use a range of supporting material to showcase their work, and take questions. Use pie, charts and line graph; mean average.

COOKING

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Use knives with an 11-12 cm non-serrated blade (supervised).	Use knives with an 11-12 cm non-serrated blade (supervised). Use peeler on carrots. Use grater for cheese.	Serrated knife with a bridge hold to cut onion (supervised). Cut, e.g. peppers with precision – even size. Use peeler on apples. Use a grater e.g. apple, carrot.	Use a 'bridge' hold to cut harder vegetables e.g. potato. Use peeler on potato. Use a grater e.g. lemon zest.	Use 'claw' grip to cut, e.g. celery, carrot.	Use large knives on hard vegetables, like swede (supervised).
	Other skills	Other skills	Other skills	Other skills	
	Sieve flour.	Mash potato (roughly); crush garlic. Break eggs, often not breaking yolks. Knead dough.	Reliably break eggs. Cream fat/sugar.	Mash a potato to a smooth texture. Separate egg whites from yolks. Folding meringue mix.	
	Hot food	Hot food	Hot food	Hot food	Hot food
	Watch adults putting food in the oven and explaining how to do safely.	Cook food in an electric stockpot (supervised).	Use a microwave or toaster (supervised).	Remove e.g. hot biscuits from a baking tray using a fish slice (supervised).	Handle hot food with oven gloves (supervised).

VOCABULARY

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Use common words and phrases relating to Design Technology	Use common words and phrases relating to Design Technology	Use some specialist vocabulary in discussions	Use some specialist vocabulary in discussions – often appropriately	Use some specialist vocabulary in discussions appropriately	Start to apply vocabulary in sophisticated ways (cross-curricular).
Suggested words	Suggested words	Suggested words	Suggested words	Suggested words	Suggested words
Product Design Technology Then When Last Next Before / after Drawing Painting Printing Trace Share Effect Improve Ingredients Material Savoury Sweet	Process Construction Model Later / earlier Paste Textile Collage Relief Object Style Fashion At the same time as Sew Compare Leavers Sliders Wheels Axles Seasoning	Chronological Approximate Accurate Technique Structure Mechanical Parallel / perpendicular perspective Quality Fabric Weave Version Purpose Opinion Organise Construct Prototype Clarify Raising agents	Structure Characteristic Aesthetic Series Circuit Cause/consequence Former/latter Trend Intricate Audience Impact Program Develop	Contemporary Prior Subsequent Enduring Dominate Context Complex Exceptional Pulley Cam Lever Gear	Simultaneous Attribute Controversy Authentic
Locational	Locational	Locational	Locational	Locational	Locational
Near / far Up / down Further Higher Underneath Centre Anticlockwise Position Direction Above Below Roughly Close to Older / newer	Left / right (from own perspective) Symmetrical reflect diagonal Range -not yet in technical math sense.	Left / right (secure)	Make use of mathematical language in describing shape and location Increase / decrease	Shape vocabulary (including diagonal, rotation, angle)	Concentric Radial Intersecting

Cycle A

TERM	Years 1 & 2	Years 3 & 4	Years 5 & 6
Autumn Term	Structures: Constructing a windmill	Structures: Constructing Anderson Shelters	Digital world: Navigating the world
Spring Term	Mechanisms: Making a moving story book Food: Fruit and vegetables	Textiles: Cushions	Structures: Playgrounds
Summer Term	Textiles: Making a puppet	Mechanical systems: Pneumatic toys Food: Adapting a recipe	Food: What could be healthier? Structures: bridges

Cycle B

TERM	Years 1 & 2	Years 3 & 4	Years 5 & 6
Autumn Term	Structures: Baby Bear's chair	Digital world: Mindful moments timer	Electrical systems: Electronic greetings cards
Spring Term	Textiles: Pouches	Electrical systems: Torches	Mechanical systems: Making a pop-up book
Summer Term	Food: A balanced diet Mechanisms: Fairground wheel	Food: Eating seasonally Electrical systems: Electric poster	Textiles: Waistcoats