

St Mary's CofE Primary School



Design Technology Curriculum Overview

Statement of Intent:

At St Mary's, our Design and Technology curriculum inspires children to be curious, resourceful and imaginative problem-solvers. We encourage pupils to notice needs in the world around them, develop purposeful ideas and take pride in making products that work for real people. From Early Years to Year 6, children grow in confidence as they investigate existing products, explore materials and mechanisms, test possibilities and learn from what does not work first time. Through collaboration, thoughtful choices and responsible use of resources, pupils learn to respect different perspectives, show courage when improving their designs and recognise how designers can make a positive difference to everyday life.

Aims:

Our D&T curriculum draws on a combination of the Design and Technology Association's Projects on a Page and PlanBee units. It aims to develop children's creative, technical and practical expertise through an increasingly demanding sequence of designing, making and evaluating. Pupils learn to work for an identified user and purpose, communicate ideas in different ways, select tools and materials for their properties and assess products against clear criteria. They build technical understanding of structures, mechanisms, textiles and electrical systems, alongside cooking, nutrition and food provenance. The curriculum is inclusive and ambitious: every child should have opportunities to make decisions, solve problems and experience the satisfaction of creating something functional.

How Design Technology is taught at St Mary's:

D&T is taught through purposeful projects that combine investigation of existing products, focused teaching of practical and technical skills, and opportunities to design, make, test and improve. Teachers introduce the knowledge and vocabulary children need before expecting them to apply it with increasing independence. Practical exploration and discussion begin in Nursery and Reception, while Key Stage 1 pupils develop simple products for users and Key Stage 2 pupils work with increasingly detailed criteria, accurate techniques and more complex systems. Cooking and nutrition develop progressively through practical food preparation. Children explain their decisions, listen to feedback and evaluate how successfully their products meet a need. The curriculum prioritises the quality of thinking and learning, not identical finished outcomes.

Long Term Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Mark-making using tools and materials	Explore colour and colour mixing	Add detail to pictures	Build and create models inspired by stories	Join materials; explore textures	Create models using chosen materials
Reception	Making bread; temporary natural-material sculptures	Sewing poppies; weaving trees; story props; mince pies	Dragons and lanterns; gingerbread to a recipe	Creating an Easter garden	Junk modelling: London structures	Space structures; preparing salads and cooking potatoes
Year 1		Free-standing structures: enclosure for farm animals		Levers and sliders: Easter cards		Preparing vegetables: designing and making pizzas
Year 2		Textiles: puppet design (templates and joining)		Preparing fruit		Mechanisms: wheels and axles
Year 3		Structures: shell structures		Healthy and varied diet: sandwiches		Levers and linkages: moving monsters
Year 4		Healthy and varied diet: vegetable muffins		Electrical systems: simple circuits and switches		Textiles: 2D shape to 3D product (goblin toys)
Year 5		Textiles: combining different fabric shapes			Burgers	Structures: bridges
Year 6		Cooking: WW2 soup		Electrical systems: more complex switches and circuits		Mechanical systems: pulleys and gears (fairground design and props)

Curriculum architecture and progression

- Substantive knowledge: understanding materials, ingredients, components, structures, mechanisms, electrical systems, food and nutrition.
- Disciplinary knowledge and skills: investigating and evaluating existing products; designing for a user and purpose; modelling; selecting, making, testing, evaluating and improving.
- Vocabulary: technical language introduced in meaningful contexts and revisited as products become more complex.

Projects should follow an iterative approach: investigate → practise focused skills → design → make → test/evaluate → improve. The sequence is flexible; pupils may revisit decisions during making.

Nursery | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: With adult support, selects materials and simple tools, joins parts, explores whether a model works and talks about what could change.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Tools, marks and materials	Explore what tools do; identify materials by feel and appearance; learn that different tools create different effects.	Select and manipulate tools; explore cutting, pressing, folding, stacking and arranging; say what has been made.	tool, material, texture, smooth, rough, soft, hard, cut, fold, build
Story models and joining	Know that materials can be connected in different ways and that a model needs parts that stay together.	Choose from tape, glue and construction pieces; try and adjust a joining method; explain a simple choice.	join, attach, glue, tape, connect, model, strong
Choosing materials	Notice that materials differ in shape, size, colour and suitability for a simple purpose.	Choose materials for a self-initiated model; test whether it stands or holds together; adapt with adult support.	choose, purpose, shape, stable, change, improve

Reception | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Creates purposeful models and simple food products, explaining choices, trying joining methods and changing designs after testing.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Food preparation: bread, mince pies, gingerbread, salad and potatoes	Recognise that ingredients can be combined and transformed; know basic handwashing and safe food preparation routines.	Follow pictorial steps; measure or portion with support; mix, shape and assemble; describe changes and taste appropriately.	ingredient, recipe, mix, knead, shape, measure, hygiene, prepare
Sewing, weaving and props	Understand that materials can be joined or interlaced to create an object for a purpose.	Explore threading, weaving and supported stitching; choose colours and materials for an intended outcome; talk about what worked.	thread, weave, stitch, fabric, pattern, attach, purpose
Model structures: London and space	Know that a structure must stand and that the way pieces are joined affects strength.	Build, test and modify models; select recycled or construction materials; describe how to make a structure more stable.	structure, base, balance, stable, support, construct, improve

Year 1 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Designs simple purposeful products for a named user; selects tools and materials; tests basic structures and mechanisms; evaluates against a small number of criteria.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Free-standing structures: farm-animal enclosure	Know what an enclosure is for; recognise base, wall and support; explore how material and shape influence strength and stability.	Investigate existing enclosures; agree simple criteria for an animal user; draw a plan; measure, cut and join; test whether the enclosure stands and contains a model animal.	enclosure, structure, freestanding, base, wall, stable, stiff, join, criteria
Levers and sliders: Easter cards	Know that a slider moves along a path and a lever pivots around a fixed point; identify moving and fixed parts.	Explore cards; make and test simple mechanisms; sketch an intended movement; assemble and evaluate whether the movement works.	lever, slider, pivot, slot, guide, movement, mechanism, card
Preparing vegetables: pizzas	Know basic hygiene; identify vegetables and their sources; recognise that ingredients and toppings can contribute to a varied diet.	Investigate toppings; plan for an eater; wash and prepare vegetables safely with age-appropriate tools; assemble and evaluate appearance and taste.	vegetable, ingredient, topping, prepare, wash, peel, cut, healthy, evaluate

Year 2 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Explains how basic mechanisms work; makes products using templates and increasingly controlled joining; makes choices using simple design criteria.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Textiles: puppet design	Know that a template produces matching shapes; understand that fabric pieces need a suitable joining method and that decoration changes appearance.	Examine puppets; develop design criteria for a user; draw and label a puppet; use a template; cut fabric; join and finish; test fit and function.	puppet, textile, fabric, template, seam, join, stitch, decorate, user
Preparing fruit	Identify fruit and its sources; understand basic healthy eating, hygiene and differences in texture, taste and appearance.	Taste and compare fruits; design a dish for a user; wash, peel, cut and combine using safe routines; assess against criteria.	fruit, produce, fresh, peel, slice, chop, texture, taste, hygiene
Mechanisms: wheels and axles	Understand that a wheel rotates around an axle and that the way an axle is attached affects whether a vehicle rolls.	Explore wheeled products; draw a design; choose components; assemble and align wheels and axles; test movement, identify friction or wobble and improve.	wheel, axle, axle holder, chassis, rotate, friction, fixed, free, vehicle

Year 3 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Uses simple research and labelled plans; makes and tests prototypes; explains how structure and movement depend on components and assembly.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Structures: shell structures	Know that a shell structure encloses or protects contents; explore nets, tabs and how folding, shaping and reinforcement affect stiffness.	Investigate packaging; use measurements and nets; score, fold and join accurately; test capacity, strength and suitability; revise design.	shell structure, net, tab, score, fold, reinforce, stiffness, packaging
Healthy and varied diet: sandwiches	Understand food groups and the role of a varied diet; recognise ingredients, origin and basic hygiene; consider different users' needs.	Research a user; select ingredients; practise safe slicing, spreading and combining; prepare a savoury product; evaluate nutrition, appearance and taste.	balanced diet, savoury, filling, spread, slice, portion, hygiene, consumer
Levers and linkages: moving monsters	Know that linkages connect levers to transmit or change movement; identify input, output and pivot points.	Investigate moving products; make prototypes of linkages; annotate a design; cut and assemble accurately; test movement and adjust pivot positions.	linkage, lever, pivot, input, output, oscillate, mechanism, prototype

Year 4 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Makes informed material and ingredient choices, uses more accurate processes, explains a functional electrical system and adapts a design after testing.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Healthy and varied diet: vegetable muffins	Understand that ingredients have different functions in a recipe; know how measuring, mixing and heating change food; apply safe cooking routines.	Compare savoury recipes; adapt for a target user; weigh ingredients; prepare vegetables; combine and cook with adult-managed heat; evaluate taste, texture and suitability.	recipe, weigh, measure, combine, bake, texture, savoury, seasonality
Electrical systems: simple circuits and switches	Know that a complete circuit is required for components to work; understand how switches open and close a circuit; distinguish conductors and insulators.	Investigate a functioning product; build and test circuits; design a product with a useful light or buzzer; position and secure components; fault-find and evaluate.	circuit, battery, cell, switch, conductor, insulator, bulb, buzzer, complete
Textiles: 2D to 3D goblin toys	Understand that a 2D pattern can be assembled into a 3D form; know seam allowance, appropriate stitches and fastening or finishing choices.	Investigate soft toys; design for a user; create and adapt pattern pieces; cut and sew with increasing accuracy; stuff, finish and assess quality.	pattern piece, seam, seam allowance, running stitch, backstitch, stuffing, fasten

Year 5 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Researches and justifies design decisions; measures and joins accurately; tests products against a specification and refines structures or textile products using evidence. For the bridges project, applies prior micro:bit programming to a purposeful moving product.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Textiles: combining fabric shapes	Know that different fabrics and joining techniques suit different functions; understand the role of seam allowance, finishing and reinforcement.	Investigate existing textile products; develop criteria; produce annotated designs and patterns; measure, cut, combine and join accurately; test durability and appearance.	fabric properties, seam allowance, reinforcement, pattern, stitch, appliqué, prototype
Food: burgers	Understand that a balanced diet requires varied ingredients and portions; know that ingredients are grown, reared or processed and that cooking requires hygiene and heat safety.	Research user needs; compare ingredients and nutrition; develop a savoury recipe; prepare and cook safely with supervision; evaluate flavour, texture, cost and presentation.	protein, carbohydrate, nutrition, ingredient, processed, portion, hygiene, cook
Structures: bridges	Know how beams, columns, triangulation and reinforcement affect strength, stiffness and stability; understand that movable bridges need a pivot or lifting mechanism and that a micro:bit can control a compatible actuator (such as a servo motor) in response to programmed inputs. Recognise that sensing bridge position requires a suitable sensor or switch.	Investigate fixed and opening bridges and their users; specify load, span and opening requirements; sketch, prototype and construct a stable bridge with a working pivoting or lifting mechanism. Test load capacity and movement, then improve the design. Apply learning from the Year 5 Purple Mash micro:bit unit to programme a compatible motor to open and close the bridge; where equipment permits, use a sensor or switch to monitor its position. Evaluate against the design specification.	bridge, span, beam, truss, triangulation, load, compression, tension, reinforce, bascule, pivot, lever, actuator, servo motor, micro:bit, input, output, control, sensor, switch, program, test

Year 6 | Substantive and Disciplinary Knowledge/Skills and Vocabulary Progression

End-of-stage expectation: Independently uses research and specifications; selects and combines materials and systems; prototypes, tests and improves functional products for intended users.

Project / experience	Substantive knowledge: know and understand	Disciplinary knowledge and skills: apply and do	Vocabulary
Cooking: Second World War soup	Understand that recipes respond to availability, seasonality, nutrition and context; know that food may be grown, reared, caught and processed.	Investigate historical constraints; select seasonal ingredients; adapt and scale a savoury recipe; prepare and cook safely; evaluate nutritional value, taste and practicality.	rationing, seasonality, local produce, nutrition, recipe, simmer, chop, portion
Electrical systems: complex switches and circuits	Know how series circuits can combine components and switches; understand the functional effect of changing circuit arrangements and the need for secure connections.	Analyse products; draw and interpret circuit diagrams; prototype and troubleshoot a user-focused electrical product; test reliability and refine.	series circuit, component, switch, terminal, connection, fault, output, schematic
Mechanical systems: pulleys and gears – fairground	Know that gears and pulleys transmit and may change speed, direction or force; recognise the role of shafts, supports and alignment.	Research fairground mechanisms; develop a specification; prototype transmission systems; measure and assemble components; test movement and reliability; refine and justify decisions.	gear, pulley, belt, shaft, drive, driven, rotation, speed, direction, transmission