St Barnabas CE Primary School and Kirmington St Helena's CE Primary School

DESIGN & TECHNOLOGY — SKILLS PROGRESSION MATRIX

RED = links to the statutory D&T National Curriculum for KS1 and KS2. EYFS foundations draw on Expressive Arts and Design and Understanding the World.

1 Core D&T skills — progression across the six stages

Skill strand	EYFS foundation	KS1 skills Stage 1	KS1 skills Stage 2	Lower KS2 skills Stage 3	Lower KS2 skills Stage 4	Upper KS2 skills Stage 5	Upper KS2 skills Stage 6
Investigating existing products and research NC: KS1 Design: use own experiences and existing products; KS2 Design: research and develop design criteria	Explore and handle familiar objects, toys and models; talk about what they do and how they work, with adult prompts.	Look at and handle an existing product; describe one feature they like or a part that moves or holds together.	Compare familiar products for a simple purpose and identify an idea that might help their own product.	Investigate existing examples and record what works, what does not and what a user needs, with prompts.	Research examples independently enough to compare their function and features; use findings to set criteria.	Analyse existing products and selected designers, identifying construction, materials, function and shortcomings.	Independently investigate a genuine user or client and analyse multiple sources, using findings to justify a specification.
Identifying the user, purpose and design brief NC: KS1 Design: purposeful, functional, appealing products; KS2 Design: research-based criteria for intended users	Say what they want to make in play and what it might be used for.	Explain in simple words what they want to make and who it is for, with adult support.	Identify a user or problem and generate two or three simple design criteria with support.	Use a given brief to identify a user, a practical need and simple criteria for success.	Develop design criteria from research and define what the product must do for the user.	Produce detailed functional and aesthetic criteria for a product intended for a specified user.	Interpret a real-world client brief, prioritise needs and constraints, and justify a detailed specification.
Generating and communicating design ideas NC: KS1 Design: talking, drawing, templates and mock-ups; KS2 Design: annotated sketches, exploded diagrams, prototypes and CAD	Communicate an idea through talk, play, drawing or a simple model.	Draw or talk about a simple product; use a teacher-supported outline or template.	Sketch and label an idea and choose between two ideas, saying why.	Produce annotated sketches showing materials, parts and intended movement or joining.	Compare at least two annotated ideas against design criteria; show key dimensions, parts or components.	Use detailed annotations, exploded diagrams and scale or measured sketches to communicate alternatives.	Communicate precise, justified iterations through technical drawings, prototypes and CAD where appropriate.
Selecting materials and components for purpose NC: KS1 Make: select from a range of tools, equipment and materials; KS2 Make: select materials by functional and aesthetic properties	Choose between familiar card, boxes, blocks, fabric and other provision materials with prompts.	Choose basic card, construction or food materials with adult guidance; say what they will use.	Choose tools and materials more independently and explain a simple reason linked to purpose.	Compare materials for strength, texture or suitability and select those needed for the planned product.	Select materials and components for their properties, appearance, function and joining needs.	Justify choices in terms of strength, fit, durability, function and finish; test alternatives.	Independently select and combine materials/components against client and technical requirements, using testing evidence.
Measuring, marking, cutting and shaping NC: KS1 Make: use tools and equipment for practical tasks; KS2 Make: apply a wider range of tools accurately	Explore rolling, folding, tearing, cutting and shaping with child-safe tools and help.	Cut, fold and shape card or soft food with support; use simple outlines.	Use simple templates and basic measuring or marking to cut matching shapes with growing control.	Measure and mark components more accurately; practise controlled cutting and shaping with suitable tools.	Use rulers, templates and, with supervision, specialist hand tools accurately for a planned shape.	Cut and shape accurately to measured dimensions, including pattern pieces and structural components.	Independently plan cutting and shaping sequences, maintaining precision and fit across complex components.
Joining, assembling and finishing products NC: KS1 Make: building and finishing techniques; KS2 Make: accurate construction and finishing	Join blocks and junk modelling using simple connecting resources; start to adapt joins.	Use glue, tape and simple fasteners to assemble a model that holds together.	Use gluing, stapling, threading or running stitch as appropriate; test and strengthen joins.	Combine a wider range of joined components; form simple seams or linkages and improve finish.	Join structural or textile parts accurately with reinforcement, seams or suitable fastenings.	Use precise joining and appropriate specialist fastenings; ensure product functions and looks finished.	Independently select and combine robust joining/finishing methods for precise fit, function and appearance.
Structures — constructing and reinforcing NC: KS1 Technical knowledge: stronger, stiffer, more stable structures; KS2: strengthen, stiffen and reinforce complex structures	Build towers and shelters with blocks, boxes and large materials; explore why they wobble.	Make a free-standing model using a wide base and simple glued/taped joints.	Adjust base width or supports after testing whether a structure stays upright.	Build a bridge or shelter with struts or a wider base; begin simple load tests.	Use bracing or triangulation to reinforce a structure for a stated purpose; test stability.	Plan and construct a frame or shell structure using measured parts and chosen reinforcement.	Independently optimise and refine a reinforced structure against loads, stability and strength-to-weight criteria.
Mechanisms — sliders, levers and linkages NC: KS1 Technical knowledge: sliders, levers, wheels and axles; KS2 Technical knowledge: mechanical systems	Explore pushing, pulling and wheeled toys; notice movement when parts are moved.	Make a card slider or simple pivoting lever using a slot or paper fastener.	Position simple moving components so the assembled toy or picture still moves; adjust if stuck.	Build and test a simple lever or linkage with support, observing planned movement.	Combine levers/linkages and adjust pivot positions, alignment or joins to solve jams.	Use prototype tests to select a mechanism that meets a detailed movement specification.	Independently design and refine reliable multi-part linked movement, evaluating its operation systematically.
Mechanical systems — cams, pulleys and gears NC: KS2 Technical knowledge: use mechanical systems, such as gears, pulleys, cams, levers and linkages	Explore toys with rotating wheels or moving parts in play.	Observe and discuss how wheels and axles turn, with adult demonstration.	Assemble simple rotating components for a moving product, with help.	Explore and compare parts of mechanical models or construction kits.	Combine two basic moving mechanisms and identify changes to their motion.	Build and test cams, followers, pulleys or gears for a planned type of movement.	Independently combine cams, pulleys and gears to alter speed, direction or movement; adjust and test reliability.
Electrical systems — circuits, switching and products NC: KS2 Technical knowledge: use electrical systems; KS1 work is exploratory, not KS1 statutory D&T circuitry	Explore how battery toys, switches and torches work through adult-led investigation.	Observe and identify battery-powered products and main parts of a simple teacher-led circuit.	Connect/disconnect a simple battery–wire–bulb or buzzer circuit with support; add a simple casing.	Assemble and test a simple series circuit; identify components and observe basic faults.	Fit a functioning switch, check connections and house a reliable working circuit in a product.	Construct and test circuits with motors and other output components, recording faults.	Independently integrate circuit, switch/input and casing; diagnose faults and refine reliability.
Computing systems — programming, monitoring and control NC: KS2 Technical knowledge: apply computing to program, monitor and control products	Notice that switches make toys or devices respond; explore cause and effect.	Say what happens when an adult uses an on/off control; no programming expected.	Identify a simple product that responds to a switch or other input, with support.	Explore inputs and outputs in existing electrical products; identify their purpose.	Test an electrical product and explain how its control affects the output.	Write and test a simple program using a microcontroller to respond to an input and control an output.	Independently debug, integrate and refine programmed control within a working product; test against criteria.

Textiles — templates, stitches, seams and fastenings **NC: KS1 Make: textiles and joining; KS2 Make: a wider range of techniques, functional and aesthetic properties**	Explore fabric, thread, joining, cutting and decorating during play.	Join fabric simply with glue, tape or assisted threading.	Use templates and practise running stitch, gluing or staples to make a textile product.	Cut two matching shapes and make a supported seam or simple second stitch.	Use two stitch types, accurate seams and suitable fastenings; choose fabric for purpose.	Test and refine pattern pieces; combine multiple pieces and practise more advanced stitches/fastenings.	Independently create an accurately fitted multi-piece textile product with precise seams, finishing and functional fastenings.
Cooking — preparation, techniques and recipe adaptation **NC: KS1 Cooking and nutrition: prepare dishes using basic food principles; KS2: prepare and cook predominantly savoury dishes using cooking techniques**	Wash, spread, mix or cut soft foods with supervision; help prepare snacks.	Wash, peel or cut fruit and vegetables using adapted tools and adult support.	Prepare ingredients more confidently; follow a simple picture recipe and evaluate a snack.	Measure and weigh ingredients; prepare and cook a simple savoury dish with supervision.	Adapt an existing recipe, applying safe cooking techniques and explaining changes.	Prepare dishes using several techniques and organise cooking steps for a balanced menu.	Independently plan, prepare and cook a balanced two-course menu; coordinate timings and evaluate results.
Safe and hygienic use of tools, equipment and food **NC: KS1 and KS2 Make: select and use tools and equipment to perform practical tasks accurately**	Use child-safe tools and food resources under close supervision, following modelled routines.	Handle scissors, fasteners and child-safe food tools with support; wash hands before food handling.	Select and use basic tools with increasing care; follow simple hygiene instructions.	Follow safe procedures when using tools or heat under supervision; manage own workstation with prompts.	Use more complex hand tools and cooking equipment accurately within agreed safety routines.	Plan safe use of tools, circuits and heat with growing independence; apply hygiene throughout food work.	Independently sequence safe methods, anticipate risks and manage precise tools and hygiene appropriately.
Prototyping, troubleshooting, testing and iteration **NC: KS1 Evaluate: evaluate ideas and products against design criteria; KS2 Evaluate: test ideas/products and seek improvements**	Try things out, notice if a model fails and change it in play.	Test if something stands or moves; make a simple adjustment with help.	Try a couple of solutions; test and say what works and what they would change.	Test material, movement or construction options; record a result and one improvement.	Compare tests against criteria, identify why a mechanism/circuit/structure fails and refine it.	Use prototypes and systematic comparisons to identify faults, improve fit and check reliability.	Iteratively test and refine components and whole systems, justify changes with evidence and check against specification.
Design journals and documenting the process **NC: KS1 Design: communicate ideas; KS2 Design: annotated sketches, prototypes, CAD where appropriate**	Contribute photos, talk, marks and drawings to an EYFS learning journey.	Contribute drawings, pupil voice and adult-scribed notes to the class floor-book.	Use a personal journal for labelled ideas, simple criteria and a brief evaluation.	Keep annotated sketches, material tests, simple criteria and making notes in a design journal.	Record research, two compared ideas, criteria checks, tests and justified changes across pages.	Independently use a working journal with exploded diagrams, test evidence and prototype reflections.	Maintain a full design portfolio showing research, iterations, technical drawings/CAD and critical evaluation.
Evaluation, feedback and justifying improvement **NC: KS1 and KS2 Evaluate: explore existing products; evaluate own ideas and products; KS2 consider others' views**	Say what was made and whether they like it; accept help to adapt it.	Say "I made…" and "I like… because…" about an existing or finished product.	Explain "I chose… because…" or "This works because…" and suggest one change.	Ask questions about an existing product; describe one success and a reason for an improvement.	Evaluate against own criteria, explain function and make a specific justified alteration.	Compare product and prototype against detailed criteria; use peer or user feedback for changes.	Critically judge the final product against a client brief, evidence and feedback; justify trade-offs and improvements.

2 Where each skill is applied in Barnetby's two-year cycle

Half-term	Cycle · skill focus	EYFS foundation	KS1	LKS2	UKS2
Autumn 2	A · Structures	Building and Junk Modelling	Tough Towers · Brunel	Built to Last · Sarah Guppy	Engineering Strength · Gustave Eiffel
Spring 2	A · Mechanisms	Marvellous Machines & Moving Toys	On the Move · Leonardo da Vinci	Moving Parts · Rowland Emett	Cams, Pulleys & Gears · Watt / Al-Jazari
Summer 2	A · Cooking & Nutrition	Food, Glorious Food	Grow, Pick, Prepare · Jamie Oliver*	Farm to Fork · Norman Borlaug	Come Dine With Me · Auguste Escoffier
Autumn 2	B · Textiles	Building and Junk Modelling	Fix & Fasten · Mary Quant	Shape & Stitch · Charles Macintosh	Pattern & Purpose · Rhodes / Saint Laurent
Spring 2	B · Electrical systems	Marvellous Machines & Moving Toys	Switch It On · Thomas Edison	Complete the Circuit · Lewis Latimer	Monitor & Control · Lovelace / Wilson / Turing
Summer 2	B · Design & Innovation	Fix It! Designing Solutions	Design a Solution · Bertha Benz	Design, Make, Improve · Margaret Knight	Design for a Client · Dieter Rams

Reading the matrix: Each skill is developed through practical units across both cycles. Examples: card joining → reinforced frames; sliders → linkages → cams/gears; supported circuits → switched series circuits → programmed control; basic fabric joining → seams → fitted patterns; snack preparation → adapted savoury dish → two-course menu.