Mandeville Primary School

Design & Technology Progression Map (Nursery–Year 6)

Curriculum Intent

At Mandeville Primary School, we believe that Design and Technology prepares our children to take part in the development of tomorrow's rapidly changing world. Our hands-on approach encourages children to become autonomous and creative problem solvers, both as individuals and as part of a team. Through the study of Design and Technology, pupils combine practical skills with an understanding of aesthetic, social and environmental issues. This enables them to reflect on and evaluate present and past inventions, their uses and their impact. We strive to help all children become informed consumers and potential innovators.

Our curriculum covers the statutory elements of the Design and Technology Programme of Study. From Year 1 to Year 6, pupils experience Food and Nutrition alongside a progressively challenging range of technical areas including mechanisms and mechanical systems, structures, textiles, electrical systems and computer-controlled products. The strands of Design, Make and Evaluate are embedded throughout these units. Textiles is taught in Years 2, 4 and 6, while structures is taught in Years 2, 3 and 5.

Design & Technology Concepts and Threads

Design & Technology Thread	How understanding develops across the curriculum
User, Purpose & Function	Pupils progress from making models based on their own ideas and experiences to designing purposeful, functional and appealing products for identified users. By Upper KS2, pupils research user needs and use design specifications to guide increasingly purposeful design decisions.
Designing & Communicating Ideas	Pupils progress from talking about and drawing what they want to make to using labelled drawings, templates and mock-ups. In KS2, they increasingly communicate ideas through annotated sketches, prototypes, pattern pieces, cross-sectional and exploded diagrams and, where appropriate, computer-aided design.
Making & Practical Skills	Pupils develop increasing independence, accuracy and control when selecting and using tools, equipment, materials and components. They progress from simple joining and construction to measuring, marking out, cutting, shaping, assembling and finishing products accurately.
Evaluation & Improvement	Pupils progress from talking about what they have made and suggesting simple improvements to testing products against design criteria, considering the views of users and critically evaluating functionality, manufacture and fitness for purpose.
Technical Knowledge	Pupils build knowledge of how products work through structures, mechanisms, mechanical systems, textiles, electrical systems and computer-controlled products. They apply this knowledge when designing and making increasingly complex products.
Cooking & Nutrition	Pupils progress from simple food preparation in EYFS to preparing dishes safely, understanding a healthy and varied diet, considering sensory characteristics and developing knowledge of seasonality and where and how ingredients are grown, reared, caught and processed.

Substantive Knowledge Progression

Phase	Mechanisms, Mechanical, Electrical & Digital Systems	Structures	Textiles & Materials	Cooking & Nutrition
Nursery	Explore how everyday objects, tools, pop-up books and wheeled toys work.	Build simple structures using blocks and construction materials.	Explore materials with different properties and textures. Join materials using simple methods and begin threading.	Spread, chop and mix when cooking and preparing snacks.
Reception	Explore how products work and use simple levers to create models and pictures.	Build increasingly complex structures using a variety of materials.	Choose effective ways of joining materials and begin to use basic sewing techniques.	Follow recipes using basic cooking techniques and begin to work safely and hygienically.
Year 1	Understand that different mechanisms produce different types of movement. Explore and use sliders and levers. Explore wheels, axles and axle holders and distinguish between fixed and freely moving axles.	Apply simple construction and joining knowledge within designed products.	Select materials and components according to their characteristics.	Understand the basic principles of a healthy and varied diet. Understand where fruit and vegetables come from. Use simple utensils and equipment to peel, cut, slice, squeeze and chop safely.
Year 2	Explore and use simple mechanisms within products, including hinges.	Investigate freestanding structures and understand how structures can be made stronger, stiffer and more stable.	Understand how simple 3-D textile products are made using templates. Join fabrics using different techniques, including stitching, gluing and stapling, and explore finishing techniques.	Understand the basic principles of a healthy and varied diet and where food comes from. Select fruit and vegetables according to characteristics such as colour, texture and taste and use preparation techniques safely.
Year 3	Investigate and use levers and linkages and distinguish between fixed and loose pivots.	Investigate shell structures. Understand how to construct strong, stiff shell structures and use nets of cubes, cuboids and, where appropriate, more complex 3-D shapes.	Understand that materials have functional properties and aesthetic qualities and select materials appropriately within products.	Understand and apply the principles of a healthy and varied diet. Understand fresh and processed ingredients, that recipes can be adapted and that some foods are processed into ingredients used in cooking.

Phase	Mechanisms, Mechanical, Electrical & Digital Systems	Structures	Textiles & Materials	Cooking & Nutrition
Year 4	Investigate battery-powered products. Understand and use electrical systems, including series circuits incorporating switches, bulbs and buzzers. Understand that electrical systems have an input, process and output.	Apply previously learned structural knowledge where appropriate within products.	Investigate 3-D textile products. Understand how to strengthen, stiffen and reinforce fabrics. Select fabrics and fastenings according to functional characteristics and aesthetic qualities and securely join pieces of fabric.	Prepare and cook predominantly savoury dishes. Understand fresh and processed ingredients and whether ingredients are grown, reared or caught. Understand that recipes can be adapted to change appearance, taste, texture and aroma.
Year 5	Understand that mechanical systems have an input, process and output. Understand how cams can produce different types of movement and change the direction of movement.	Investigate frame structures and understand how to strengthen, stiffen and reinforce 3-D frameworks. Apply learning from Science and Maths when designing and making products.	Select materials and components according to their functional properties and aesthetic qualities within increasingly complex products.	Prepare and cook predominantly savoury dishes using a range of techniques. Select and prepare ingredients according to sensory characteristics and make appropriate alterations to recipes.
Year 6	Understand the use of computer-control systems in products. Apply computing knowledge to program, monitor and control products and understand how a computer can monitor changes in the environment and/or control a product.	Apply accumulated understanding of materials, strengthening and construction where appropriate within increasingly complex products.	Investigate textile products and use pattern pieces, mock-ups and prototypes. Select and use fabrics and equipment to produce accurately assembled and well-finished products.	Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed. Prepare ingredients safely and skilfully when producing predominantly savoury dishes.

Disciplinary Knowledge Progression

Phase	Designing	Making	Evaluating
Nursery	Develop their own ideas about what to make. Begin to draw simple models and designs and decide which materials to use.	Join different materials, build simple structures and use basic food-preparation techniques. Follow simple pictorial and sequenced instructions.	Talk about what they have made and begin to suggest how it could be improved.
Reception	Plan simple models and designs and discuss what they want to make. Build on previous ideas and select appropriate materials and joining methods.	Follow several instructions in sequence. Join materials in different ways and use a range of tools and materials with increasing precision.	Explain what they have made and discuss how their own work and the work of others could be improved.

Phase	Designing	Making	Evaluating
Year 1	Generate ideas from personal experiences and simple design criteria. Identify who a product is for and how it will be used. Communicate ideas through talk, drawings and simple mock-ups.	Plan what to do next. Select tools and materials for a purpose and use them to cut, shape and join materials. Use simple finishing techniques and follow safety procedures.	Evaluate how well a product works for its intended purpose and user. Identify good and less successful aspects and suggest simple changes or improvements.
Year 2	Design functional, appealing products for a chosen user and purpose. Generate, develop and communicate ideas through talking, drawings, templates and mock-ups.	Select appropriate tools and equipment for tasks including marking out, cutting, joining and finishing. Select materials according to their characteristics.	Explore existing products and evaluate ideas during the making process. Evaluate completed products against the original design criteria.
Year 3	Generate realistic ideas and design criteria focused on the needs of the user. Use annotated sketches and prototypes to develop and communicate ideas. Gather information about user needs and plan a sequence of actions.	Order the main stages of making. Select tools, materials and components and measure, mark out, cut, shape, assemble, join and finish with some accuracy.	Evaluate products and ideas against design criteria and user needs. Consider the views of others and identify strengths and areas for development.
Year 4	Gather information about needs and wants and use this to develop design criteria. Generate and communicate realistic ideas through discussion, annotated sketches, cross-sectional or exploded diagrams and prototypes.	Order the stages of making. Select tools, materials and components according to their functional properties and aesthetic qualities and work with increasing accuracy.	Evaluate ideas and products against design criteria. Consider the views of intended users, identify strengths and areas for improvement and explain how products could be improved.
Year 5	Research user needs using surveys, interviews, questionnaires and web-based resources. Develop a simple design specification and take account of constraints including time, resources and cost. Use annotated sketches, prototypes and diagrams to develop ideas.	Produce a clear step-by-step plan. Select appropriate tools and materials and accurately measure, mark out, cut, shape, join, assemble and finish products. Work within identified constraints.	Test and critically evaluate products against the design specification, intended user and purpose. Consider user feedback and identify improvements to functionality, manufacture and fitness for purpose.
Year 6	Generate innovative ideas through research. Develop, model and communicate ideas through drawings, templates, mock-ups, prototypes and, where appropriate, computer-aided design. Design purposeful products for an intended user using a design specification.	Produce detailed lists of equipment and materials and formulate step-by-step plans. Select and use tools accurately to produce well-assembled and well-finished products while managing time, resources and cost.	Compare final products with the original design specification. Test products with intended users and critically evaluate design, manufacture, functionality and fitness for purpose. Use the views of others to improve work.

Design Process Progression

Phase	Progression
Nursery	Explore materials; develop an idea; make; talk about what has been made.
Reception	Plan a simple idea; choose materials and joining methods; follow a sequence; make; explain and improve.
Year 1	Identify a user and purpose; generate ideas; make using selected tools and materials; evaluate against simple design criteria.
Year 2	Investigate existing products; develop design criteria; communicate ideas; make; evaluate against the original criteria.
Year 3	Investigate users and products; develop realistic ideas and criteria; prototype and plan; make with increasing accuracy; evaluate using feedback.
Year 4	Research user needs; develop design criteria; model and refine ideas; make accurately; test and evaluate against criteria and user needs.
Year 5	Conduct focused research; develop a simple design specification; consider constraints; prototype and plan; manufacture accurately; critically evaluate and improve.
Year 6	Research and identify user needs; develop an informed design specification; generate and model innovative ideas; plan and manufacture independently; test with users; critically evaluate functionality and fitness for purpose.