Otford Primary School

Courage, Kindness, Curiosity

Design and Technology Curriculum Document

Intent for Design and Technology Curriculum

Design and Technology is an inspiring, challenging and practical subject which prepares children to contribute to the development of our rapidly changing world. Throughout EYFS, KS1 and KS2, children are encouraged to become informed consumers, creative thinkers, problem-solvers and potential innovators. Children use creativity, imagination, experience and research to design, make and evaluate products that tackle relevant social and environmental problems for today's society. Children will develop technical and practical expertise, through experimenting with a range of tools, materials, processes and techniques, in the areas of construction, mechanisms and food and nutrition. In addition, children will be expected to build their understanding of a product's purpose, aesthetic and function, to test out their ideas and to critique and evaluate the work of others. Collaborative work in Design and Technology helps to foster mutual respect for the different perspectives and capabilities of peers and helps develop children's capacity to communicate, negotiate, persuade and feedback to others.

At Otford, Design and Technology is taught through a series of Construction, Mechanisms, Textiles and Cooking and Nutrition units which follow a 'Design/Make/Evaluate' structure. Throughout KS1 and 2, all children will experience a Construction unit and, in addition, each year group explores a focus mechanism with the intention that children create and integrate the mechanism into a purposeful product of their own.

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
		Wheels and Axles	Levers and Sliders	Pneumatics	Electrical Systems	Cogs, Cams and Gears	Robotic Systems
Design	To be able to talk about the ideas and processes for their designs and products. To be able to discuss what they are making, and whether they have a purpose or a user in mind.	To be able to create simple design ideas based on discussion and experience of existing products. To be able to describe what and who their product is for. *Design criteria set by teacher/children*	To be able to design purposeful, functional, appealing products based on design criteria. To be able to describe what and who their product is for and how it will work. *Design criteria set by teacher/children*	To be able to use knowledge of existing products to inform design criteria for his/her own functional product. To be able to generate realistic ideas for their product, focusing on the needs of the user. To be able to share and clarify ideas through discussion. *Design criteria co-created teacher/pupil*	To be able to use knowledge of existing products to inform design criteria for a functional and appealing product with a particular purpose and audience. To be able to generate realistic ideas for their product, focusing on the needs of the user. To be able to share and clarify ideas through discussion. *Design criteria co-created teacher/pupil*	To be able to use his/her research into existing products and his/her market research to inform the design criteria for his/her own innovative product with a specific purpose and audience. To be able to create prototypes/patterns to show his/her ideas. *Design criteria developed by children independently/peer assessed*	To be able to use research he/she has done into famous designers and inventors to inform the design criteria for his/her own innovative products with a specific purpose and audience. To be able to generate innovative ideas, drawing on research. To be able to make design decisions, which take account of constraints such as time, finances etc. *Design criteria developed by children independently/peer assessed*

	To be able to communicate and clarify ideas through talk and play.	To be able to communicate design ideas using annotated sketches (simple drawings with labels).	To be able to communicate their ideas through annotated sketches (simple drawings with labels).	To be able to communicate their ideas through cross-sectional diagrams.	To be able to communicate their ideas through exploded diagrams.	To be able to communicate their ideas through Computer Assisted Design (CAD). [Sketchup, Purplemash, Techsoft]	To be able to communicate their ideas through Computer Assisted Design (CAD).
	To be able to communicate and clarify ideas through simple mark making, drawings, pictures and photographs. *Communicate ideas*	To be able to develop and communicate ideas by talking and drawing, drawing on their own experience. Use pictures and words to describe what he/she wants to do. *Describe choices*	To be able to plan out the main stages of the making process and the tools, materials and components involved based on their characteristics. *Consider and describe choices*	To be able to plan the order of their work for the making process and outline how the tools, materials and components will be used based on their functional properties and aesthetic qualities. *Consider and explain choices*	To be able to use his/her knowledge of techniques and the functional and aesthetic qualities of a wide range of materials to plan how to use them and in what order based on their functional properties and aesthetic qualities. *Consider and justify choices*	To be able to produce step-by-step plans to guide his/her making, demonstrating that he/she can apply his/her knowledge of the functional properties and aesthetic qualities of different materials, tools and techniques. *Consider and justify choices according to effectiveness.*	To be able to produce step-by-step plans to guide his/her making, demonstrating that he/she can apply his/her knowledge of functional properties and aesthetic qualities to choose appropriate materials, tools and techniques. *Consider and justify choices according to effectiveness.*
Make	To be able to start using the correct vocabulary for materials and tools. To be able to recognise that tools have a purpose.	To be able to use the correct vocabulary to describe materials and name tools.	To be able to use the correct vocabulary to describe materials and name tools.	To be able to use the correct vocabulary to describe materials and name tools and techniques.	To be able to use the correct vocabulary to describe materials and name tools and techniques.	To be able to use the correct vocabulary to describe materials and name tools and techniques.	To be able to use the correct vocabulary to describe materials and name tools and techniques.

	To be able to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function to create something new. To be able to construct structures and products e.g. stacking blocks vertically and horizontally, making enclosures and creating spaces. *<u>Adult assistance & risk assessment</u> scissors, hole punch, staple, pin, sew ,glue, tape, string, card, fabric, wood etc.*	To be able to perform practical tasks using simple tools and equipment. To be able to measure, mark out, cut and shape a range of materials. To be able to assemble, join and combine materials to make simple products using a variety of materials e.g. glue, masking tape, running stitch. *<u>Adult assistance & risk assessment</u> scissors, hole punch, staple, pin, sew, glue, tape, string, card, fabric, wood etc.*	To be able to perform practical tasks using simple tools and equipment. To be able to safely measure, mark out, cut and shape materials and components using a range of tools. To be able to choose appropriate tools, equipment, techniques and materials from a range. To be able to assemble, join and combine materials to make a product using a range of tools. *<u>Adult assistance & risk assessment</u> scissors, hole punch, staple, pin, sew, glue, tape, string, card, fabric, wood, template etc.*	To be able to make suitable choices from a wider range of tools and unfamiliar materials. To be able to safely measure, mark out, cut, shape, assemble and join with some accuracy using a range of tools. To be able to assemble, join and combine materials and components accurately using a range of tools. To be able to identify improvements and modify design based on feedback. *<u>Adult supervision & risk assessment</u> junior hacksaw, glue guns, hammer, pliers, needles, card, wood, metal, fabric, plastic, template etc.*	To be able to safely use tools and techniques which require more accuracy to cut, shape, join and finish his/her work e.g. Cutting internal shapes, slots in frameworks. To be able to identify improvements and modify design based on feedback. *<u>Adult supervision & risk assessment</u> junior hacksaw, glue guns, hammer, pliers, needles, card, wood, metal, fabric, plastic etc.*	To be able to work safely with tools and techniques to make careful and precise measurements so that joins/seams, holes and openings are in exactly the right place. To be able to use technical knowledge and accurate skills to identify improvements and problem solve during the making process *<u>Adult supervision & risk assessment</u> junior hacksaw, glue guns, hammer, pliers, pins, needles, card, wood, metal, fabric, plastic, template etc.*	To be able to select and use appropriate tools, equipment and techniques accurately and safely. To be able to **u**se technical knowledge and accurate skills to identify improvements and problem solve during the making process To be able to apply his/her knowledge of materials and techniques to refine and rework his/her product to improve its functional properties and aesthetic qualities. *<u>Adult supervision & risk assessment</u> junior hacksaw, glue guns, hammer, pliers, pins, needles, card, wood, metal, fabric, plastic, template etc.*

Evaluate	To be able to talk about features of their own and others work, recognising the differences between them and the strengths of others.	To be able to evaluate and assess the products that he/she has made against design criteria. *by discussing what they have made, the making process, the tools involved and how well the product suits its purpose etc.* To be able to ask simple questions about products that he/she has made.	To be able to evaluate and assess the products that he/she has made against design criteria. *by discussing what they like/dislike, identifying strengths and possible changes they might make*	To be able to consider and modify their design ideas throughout. To be able to investigate and analyse products he/she has made, considering a wide range of factors. To be able to consider the views of others to improve their work. *by identifying strengths and areas for improvement by carrying out appropriate tests*	To be able to consider and modify their design ideas throughout. To be able to consider how his/her own products might be improved and how well they meet the needs of the intended user. To be able to consider the views of others to improve their work. *by identifying strengths and areas for improvement by carrying out appropriate tests.*	To be able to consider, test, assess and modify their design ideas throughout. To be able to make detailed evaluations about his/her own product against their own design criteria. To be able to consider the views of others and decide which to implement to improve their work. *by identifying strengths and areas for improvement by applying experience/knowledge of other products by carrying out appropriate tests.*	To be able to consider, test, assess and modify their design ideas throughout. To be able to use his/her knowledge of famous designs to further compare and judge the effectiveness of products he/she have made. To be able to consider the views of others and justify which implement to improve their work. *by identifying strengths and areas for improvement by applying experience/knowledge of other products by carrying out appropriate tests.*
	To be able to explore and describe the features of existing products.	To be able to ask simple questions about existing products.	To be able to evaluate and assess existing products.	To be able to investigate and analyse existing products.	To be able to consider how existing products might be improved and how well they meet the needs of the intended user.	To be able to make detailed evaluations about existing products.	To be able to use his/her knowledge of famous designs to further explain the effectiveness of existing products.

Technical Knowledge	To be able to move and manipulate products with a range of different movement mechanisms. *e.g. springs, windmills, pull back vehicles, boats, acrobats all of which move in different ways.*	To explore and use wheels and axles in their products. *e.g. vehicles* To be able to describe how their mechanism works and how it integrates with the product.	To explore and use sliders and levers in their products. *e.g. pop-up fairy tales book* To be able to describe how their mechanism works and how it integrates with the product.	To understand and use pneumatic systems to create movement in their products. *e.g. moving monsters* To be able to describe how their mechanism works and how it integrates with the product.	To understand and use electrical systems in their products *e.g. electrical torch* To be able to describe how their mechanism works and how it integrates with the product.	To understand and use cams/gears/cogs in their products. *e.g. automata toy* To be able to describe how their mechanism works and how it integrates with the product.	Apply their understanding of computing to program, monitor and control their products. *e.g. step counter* To be able to describe how their mechanism works and to how it integrates with the product.
	To be able to join construction pieces together to build and balance.	To be able to build simple structures and explore their stability.	To be able to investigate different techniques for stiffening a variety of materials and explore different methods of enabling structures to remain stable.	To be able to create and strengthen frames using diagonal struts.	To be able to apply techniques he/she has learnt to strengthen, stiffen and reinforce structures and explore his/her own ideas.	To be able to build more complex 3D structures and apply his/her knowledge of strengthening, stiffening and reinforcing techniques to make them stronger or more stable.	To be able to use a wide range of methods to strengthen, stiffen and reinforce complex structures and can use them accurately and justify their selection.
Knowledge				To know how events and individuals in design and technology have helped shape the world.	To know how events and individuals in design and technology have helped shape the world.	To know how events and individuals in design and technology have helped shape the world.	To know how events and individuals in design and technology have helped shape the world.
	To know that tools have a purposes and are used to create a desired effect.	To know what ‘annotation’ means and what an annotated diagram looks like.	To know what ‘annotation’ means and what an annotated diagram looks like.	To know what ‘cross-sectional’ means and what an cross-sectional diagram looks like.	To know what ‘exploded diagram means and what an exploded diagram looks like.	To know what ‘CAD’ means and what CAD looks like.	To know what ‘CAD’ means and what CAD looks like.

	To know that materials and media can be combined and changed to create different effects.	To know what wheels and axles are and how they work.	To know what sliders and levers are and how they work.	To know what pneumatic systems are and how they work.	To know what electrical systems are and how they work.	To know what cams/gears/cogs are and how they work.	To know what computing hardware and software are and how they work.
	To know the given vocabulary for EYFS.	To know the given vocabulary for Y1.	To know the given vocabulary for Y 2.	To know the given vocabulary for Y3.	To know the given vocabulary for Y4.	To know the given vocabulary for Y5.	To know the given vocabulary for Y6.

Vocabulary	Build , Construct, Cut, Shape, Join, Make, Describe, Draw, Decorate, Materials, Tools, Bead, Button, Fabric, Felt, Paper, Card, Wood, Blocks, Scissors, Sew Sellotape Glue Stick, Masking Tape, Paper Clip Plasticine, Ruler, Straws, Glue, Brush, Pencil, String.	As for EYFS plus Assemble, Structure, Audience, User, Purpose, Function, Techniques, Equipment, Product. Reinforce, Stiffen, Support, Finish, Components, Mechanism, System, Input, Process, Output, Wheel, Axle, Chassis, Superstructure, Properties, Characteristics, Measure, Centimetre/metre, 2D, 3D, Design Criteria, Annotate, Label, Pattern, Template, Compare, Explain, Improve, Strength, Weakness, Hole Punch, Stapler. **Properties:** Hard, Soft, Strong, Weak, Tough, Brittle, Stiff, Rigid, Flexible, Stable, Absorbent, Waterproof, Wear and tear, Smooth, Rough, Transparent, Opaque, Translucent **Materials:** Wood, Metals, Copper, Tin, Steel, Gold, Silver, Aluminium, Chrome,	As for Year 1 plus: Lever, Slider, Guide, Bridge, Pivot, Fulcrum, Guide, Bridge, Slot, Arc, Linear, Rotary, Reciprocating, Oscillating, Seam, Join, Stitch, Needle, Pin, Running stitch, Blanket stitch Solid, Squash, Bend, Twist, Stretch	As for Year 2 plus: Frame, Strut, Hinge, Integrate, Process, Horizontal, Vertical, Diagonal, Score, Saw, Hacksaw, Bench Hook, Vice, Safety Ruler, Sandpaper, Glue Gun, Pliers, Hammer Pneumatics, Syringe, Tube, Force, Compress, Pump, Piston, Inflate, Deflate, Pressure, Hydraulics, Function, Aesthetic, Cross-section, Prototype, Evaluate, Analyse, Innovate, Adapt, Modify, Test, Assess, Effective, Needs Properties: Elasticity, Plasticity, Absorbency, Magnetic, Non-magnetic	As for Year 3 plus: Electrical components, Circuit, Series, Switch, Bulb, Buzzer, Motor, Appliance, Conductivity, Batteries, Cells, Wires, Exploded diagram Analyse Bodkin, Cotton thread, Cross stitch, Hook and eye, Loom, Weave, Pinking Shears, Press stud, Allowance, Tacking, Thimble, Velcro	As year 4: Gears, Pulleys, Cams, Driver, Follower, Levers, Linkages, Pivot, Force, Effect, Air/ Water resistance, Friction, Gravity, Computer-Assisted Design (CAD), Net, Elevation, Linear, Rotary, Oscillating. Parameters, Requirements	As year 5 plus: Robotics, Programme, Monitor, Control, Variation, Debug, Algorithm, Software, Hardware, Justify, Synthesise

		Plastic, Polythene, Polystyrene, PVC, Fabrics, Cotton, Silk, Polyester, Wool, Acrylic, Foam, Glass, Rubber					
Cooking and Nutrition, Knowledge and Skills	To be able to use sensory experience - taste, smell, sight, touch - to develop a food vocabulary.	To be able to talk about what he/she eats at home and begin to discuss what healthy foods are.	To know the need for a variety of food in a diet.	To be able to talk about the different food groups and name food from each group.	To know what makes a healthy and balanced diet, and that different foods and drinks provide different substances the body needs to be healthy and active.	To know the main food groups and the different nutrients that are important for health.	To be able to confidently plan a series of healthy meals based on the principles of a healthy and varied diet.
	To be able to observe and experience how food is grown. *Reception garden*	To be able to say where some food comes from and give examples of food that is grown.	To know that all food has to be farmed, grown or caught.	To know that food has to be grown, farmed or caught in Europe and the wider world.		To know how a variety of ingredients are grown, reared, caught and processed to make them safe and palatable / tasty to eat.	To know that some foods are processed into ingredients that can be eaten or used in cooking.
	To be able to prepare a healthy snack using simple food preparation techniques with adult support *e.g. cutting an apple; peeling a carrot.*	To know that everyone should eat at least five portions of fruit and vegetables every day.	To be able to sort foods into the five groups on the eat-well plate.	To know that seasonality may affect the ingredients available and understand the advantages of eating seasonal and locally produced food.		To be able to evaluate and adapt meals and explain the health benefits or palatability of their choices. (e.g. with reference to appearance, taste, texture, aroma, protein, nutrient content etc.).	To be able to information on food labels to inform and validate choices.

	To be able to describe the need for safety and hygiene in the kitchen.	To be able to use simple tools with help and cookery techniques to prepare food safely (and hygienically) without a heat source.	To be able to use simple tools with help and cookery techniques to prepare food safely (and hygienically) without a heat source.	To be able to read and follow a savoury recipe which involves several processes, skills and techniques to combine ingredients.	To be able to read and follow a savoury recipe which involves several processes, skills and techniques to combine ingredients.	To be able to research, plan, prepare and cook savoury recipes with appropriate ingredients and use a wide range processes, skills and techniques to combine them. *e.g. curry, bread making peeling, chopping, slicing, grating, mixing, spreading, kneading and baking*	To be able to research, plan and prepare and cook a savoury dish, applying his/her knowledge of ingredients and his/her technical skills.
		To be able to use simple techniques such as cutting, peeling and grating. *e.g. seasonal salad/ sandwich*	To be able to use simple techniques such as cutting, peeling and grating. *e.g. seasonal salad/ sandwich*	To be able to measure or weigh using measuring cups or electronic scales. *e.g. savoury muffins, spaghetti bolognaise*	To be able to measure or weigh using measuring cups or electronic scales. *e.g. savoury muffins, spaghetti bolognaise*		To be able to measure accurately and calculate ratios of ingredients to scale up or down from a recipe. *e.g. multi-course meals/tapas/ mezze*
Vocabulary	Apron Chop Cut Equipment Fork Knife Spoon Mix Stir Prepare Cook Healthy Ingredients Recipe Hygiene Safety Wash, Tie, Fruit, Vegetables	Recipe Prepare Cook Method, Technique, Measure, Mix, Peel, Grate, Sieve, Weigh, Amount, Chopping Board Cleaning cloths Grater, Peeler, Mixing bowl Saucepans, Scales, Wooden spoon Food source, Nutrition, Ingredients, Varied, Balanced Diet, Bake Grill, Carbohydrate, Protein, Diary, Fat, Nutrients		Grown, Caught, Raised, Produce, Food origin, Seasonal, Spring, Summer, Autumn, Winter, Steam, Poach, Griddle, Fry, Boil, Whisk, Add, Substitute, Knead, Slice, Grams/Kilograms, Millilitre/Litre, Spatula, Ladle, Temperature, Bacteria.		Calories, vitamins, minerals, Saturated/Unsaturated fat, Seasonality, Sustainability, Carbon footprint Diet, allergies, vegetarian, vegan, flexitarian, coeliac, gluten-free, flavour, palatable, visual appeal, texture, aroma,	