St Mary and St Paul's CE Primary

Knowledge Overview – Design and Technology

	Autumn	Spring	Summer	Enhancements
Year 1	**Mechanisms – levers and sliders** • I can research lever and slider books. • I know how levers and sliders work. • I can make a lever and a slider. • I can design a storyboard to retell a fairy tale. • I can make a storyboard with a lever and a slider • I can evaluate my storyboard.	**Food – Fruit Kebab** • I can recognised a variety of fruits. • I know how to describe a fruits taste and texture. • I know how to prepare a variety of fruits. • I can design a health fruit kebab snack. • I know how to make a fruit kebab snack. • I can evaluate may fruit kebab snack.	**Structures – Free Standing Structures** • I can research playground equipment in the local area. • I can draw and label playground equipment thinking about materials and it's structure. • I can explore ways to make construct free-standing structures. • I can design a piece of playground equipment for my friends. • I can make a model piece of playground equipment. • I can evaluate my piece of playground equipment.	Food links to our Healthy Schools award. Visit to the Bryer play area to explore a real playground and understand how it was designed. Levers and sliders – linked to Christmas or a fairy tale.
Vocabulary	Mechanism, lever, slider, hide, move, reveal, effect, mechanism, lever, slider, hide, move, reveal, effect, push, pull, left, right, up, down, forwards, backwards, in, out, pivot, slot, guide or bridge, paper fastener (pivot), ideas, design, storyboard, retell, construct, background, characters, evaluate, skills, improve.	Fruit names, grown, harvested, peel, seeds, flesh, edible, inedible, sweet, sour, sharp, bland, firm, crunchy, squashy, juicy, hygiene, washing, utensils, knives, vitamins, minerals, fibre, health snack, suitable, design, safely, purpose, user, evaluate, improve, skills	Framework, base, joined, strong, strengthened, towers, walls, wood, plastic, metal, brick, 2D and 3D shapes, structures, stiffer, stronger, stand-up, stable, design, pointed, curved, straight, thicker, thinner, corner, construct, evaluate, improve.	

Key skills (please also see the D&T skills progression document)	
Designing	• Children will know the purpose of the product they are designing and describe what it is for. • Their designs will have a range of contexts (playgrounds and story based). • Generate ideas through drawings and talking. Start to model ideas.
Making	• Select from a range of tools and equipment. Select and use a range of materials and components. • Follow safety procedures for safety and hygiene. • Assemble, join and combine materials and components.
Evaluating	• Suggest what they like and dislike about products. • Make simple judgements about their products and ideas against criteria.
Technical knowledge	• Learn about simple mechanisms (levers and sliders). • Learn how freestanding structures can be made stronger, stiffer and more stable.

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Year 2	**Textiles – templates and joining** • I can investigate a variety of hand puppets. • I can investigate methods of joining fabric. • I can use running stitch to sew fabric. • I can design a puppet. • I can make a puppet using a template and variety of joining techniques. • I can evaluate my puppet design.	**Mechanisms – Wheels and Axels** • I can explore a range of wheeled vehicles. • I can draw and label a wheeled vehicle. • I know how axels work. • I can design a vehicle for a superhero. • I can construct a vehicle with wheels and axles. • I can evaluate my vehicle for a superhero.	**Food – Sandwiches** • I can identify food that could be taken on a picnic. • I can taste and evaluate a variety of ingredients. • I can design a healthy snack to take to a teddy bear's picnic. • I can prepare salad vegetables for my snack. • I can make a healthy snack. • I can evaluate my healthy snack.	Food unit links to Science and PSHE topics about health. Children will have a Teddy Bears Picnic to taste test their sandwiches.
Vocabulary	Needle, thread, fabric – binka, investigate, evaluate, hand puppets, fabrics, joining, finishings, fastenings, purpose, products Gluing, stapling, safety pins, strongest, appropriate/suitable	Wheel, vehicle, axle, body, chassis, axle holders, diagram, label, purpose, fixed axle, free axle, bearing, superhero, design, product, purpose, construct, assemble, names of tools and equipment, cutting, joining, evaluate, improved	Healthy, fruit and vegetables, sweet, savoury, sweet, crunchy, soft, juicy, spicy, creamy, recipe, exploded diagram, washing, peeling, slicing, grating, hygiene, preparing, ingredients, evaluate, skills, purpose	

Key skills (please also see the D&T skills progression document)		
	Designing	• Work confidently within a range of contexts (imaginary, local community). • Say whether their products are for themselves or other users. • Say how their products will work. • Use knowledge of existing products to help come up with ideas.
	Making	• Plan by suggesting what to do next. • Select from a range of materials and components according to their characteristics. • Use a range of materials and components, including construction materials and kits, textiles and food.
	Evaluating	• Talk about their design ideas and what they are making. • What/who are their products are for and how they are used. • What they like and dislike about products.
	Technical knowledge	• Learn about simple working characteristics of materials and components. • About the movement of simple mechanisms (wheels and axels). • That a 3D textiles product can be assembled from two identical fabric shapes.

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Knowledge Overview – Design and Technology

	Autumn	Spring	Summer	Enhancements
Year 3	**Seasonal Food** • I know that fruit and vegetables are grown in seasons. • I can taste test a variety of seasonal vegetables. • I can create a recipe using seasonal vegetables. • I can make my vegetable gratin using my own recipe. • I know what makes a healthy and balanced meal. • I can evaluate my final product.	**Structures – Shell Structures** • I know how to evaluate my shell structure packaging. • I know how to construct my shell structure packaging. • I know how to use CAD to design a shell structure as a package for Easter treats. • I know how to use CAD explore 3D shapes manipulating their shape and size. • I know how graphics are used to attract customers. • I know how to investigate a variety of packages seeing how their net has been made.	**Links and Levers – Pop-up Book** • I can investigate a variety of pop-ups using levers and linkages. • I can develop my understanding of how levers and linkages work. • I can design my pop-up including levers and linkages. • I can construct my pop-up using levers and linkages. • I can evaluate my final product.	Shell Structures unit to link to Easter – children can design a box for some Easter treats. Seasonal Food links to the Art topic for Autumn term – Autumn
Vocabulary	Seasons, seasonality, seasonal fruit and vegetables, harvested, grown, fresh produce, tastes, textures, vocabulary to describe tastes and textures, recipe, ingredients , vegetable gratin, cook, hygiene, hygienically, cutting, chopping, mixing, pouring, sprinkling, healthy eating, balanced meal, protein, carbohydrates, sugars, fats, dairy, compliment, evaluate, product, skills, improve, change	Packages, net, tabs, shell structure, cube, cuboid, prism, designer, graphics, consumers/customers, logo, font, colours, picture, style, faces, vertex, edges, manipulate, 3D shapes, 2D shapes, ideas, theme, attractive, joining, adhesives, assemble, construct, evaluate, final product, skills, improve, meets design brief.	Lever, linkage, mechanism, pop-ups, linear, rotary, oscillating, reciprocating, input, output, fixed and loose pivots, slot, guide or bridge, design, annotated sketches, construct, evaluate, product	

Key skills (please also see the D&T skills progression document)	
Designing	• Work confidently within a range of contexts, such as the home, school, leisure. • Develop their own design criteria and use these to inform their ideas. • Generate realistic ideas, that take account of the availability of resources.
Making	• Order the main stages of making. • Select the tools and equipment suitable for the task. • Follow procedures for safety and hygiene.
Evaluating	• Identify the strengths and areas for development in their ideas. • Refer to their design criteria as they design and make.
Technical knowledge	• Know how mechanical systems such as levers and linkages create movement. • How to make strong, stiff shall structures. • That food ingredients can be fresh, pre-cooked and processed.

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Knowledge Overview – Design and Technology

	Autumn	Spring	Summer	Enhancements
Year 4	**Mechanisms - pneumatics** • I know how objects use air to make them work. • I can construct a simple pneumatic system. • I can gather ideas for my design of a moving monster toy. • I can design a monster with a moving pneumatic system. • I can construct a moving monster pneumatic toy. • I can evaluate my moving monster pneumatic toy.	**Textiles – Making a Bag** • I can investigate a variety of textile products. • I can practice a variety of stitches. • I can design a bag. • I can make a pattern for my bag. • I can construct my bag design using sewing techniques. • I can evaluate my bag.	**Electrical – Illuminated signs** • To investigate and analyse illuminated signs. • I can investigate and practice using a variety of switches. • I can construct a wooden frame. • I can design an illuminated sign with a switch. • I cam construct my illuminated sign using my design. • I can evaluate my illuminated sign.	Children's textile unit will link to their art topic – Yayoi Kusama – where they will design a piece of fabric. Their moving monsters toy can be linked to Christmas. Children will learn about Electricity in Science.
Vocabulary	System, input, output, process, design brief, moving monster, ideas, design, annotated, components, materials, accurate, instructions, embellish, evaluate, final product, skills, improve, meets design brief.	Textiles, products, stitches, joins, fabrics, finishing techniques, fastenings, purpose, running stitch, back stitch, over sew stitch, sampler, design, design brief, materials, construction, embellishment, symbols, pattern, designers, fit, measure, construct, sewing techniques, embellish, evaluate, final product, skills, improve, meets design brief.	Illuminated, purpose, construction, switches, series circuit, fault, connection, toggle switch, push to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, wooden frame, junior hacksaws, G-clamps, bench hooks and card triangles, design criteria, labelled diagram, appealing, construct, evaluate	

Key skills (please also see the D&T skills progression document)		
	Designing	• Describe the purpose of their products. • Gather information about the needs and wants of particular individuals and groups. • Use annotated sketches, cross sectional drawings and exploded diagrams to develop and communicate their ideas.
	Making	• Use a wider range of materials and component than KS1 construction materials and kits, textiles, mechanical components and electrical components. • Measure, mark out, cut and shape materials and components with some accuracy. • Assemble, join and combine components with some accuracy.
	Evaluating	• Use their design criteria to evaluate their completed products. • Consider the views of others, including intended users to improve their work.
	Technical knowledge	• To know how simple electrical circuits and components can be used to make functional products. • That a single fabric shape can be used to make a 3D product.

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Knowledge Overview – Design and Technology

	Autumn	Spring	Summer	Enhancements
Year 5	**Textiles – Combining Fabric** • I can investigate, analyse and evaluate a range of existing products. • I know how to join fabric using a variety of stitches. • I know how to research my products design. • I can use CAD to design a fabric Christmas decoration. • I can make a 3D Christmas decoration using a variety of stitches. • I can evaluate my decoration considering my design brief.	**Food – Bread** • I can investigate, analyse and evaluate a range breads from around the world. • I know how bread is made. • I know how bread products are an important part of a balanced diet and can be eaten in different ways. • I can design a hot cross bun. • I can bake hot cross buns. • I can evaluate my hot cross buns.	**Structures – frame structures** • I can investigate frame structures and make annotated drawings. • I can investigate how 3D shapes can be reinforced and strengthened. • I can cut and join wood with accuracy. • I can design and plan my frame structure. • I can construct my frame structure with accuracy. • I can evaluate my frame structure.	Children can link their Combining Fabrics topic with Christmas. The Frame Structures topic links with their Geography Rainforests topic.
Vocabulary	Investigate, analyse, evaluate, products, functional, decorative, stitches, running stitch, back stitch, stem stitch, design brief, market research, questionnaires, CAD, template, pattern, embellishments, seam allowance, critically evaluate, manufacture, functionality, innovation.	Investigate, analyse, evaluate, products, risen, flat bread, appearance, texture, taste, balanced diet, nutritional content, protein, carbohydrate, fibre, sugar, recipe, dietary requirements, design, knead, mix, rise, dough, equipment, combine, evaluate, improved.	Frame structure, portable, permanent, stiffen, strengthen, reinforce, triangulation, stability, junior hacksaws, G-clamps, bench hooks, card triangles, annotated, sketch, purpose, user, accuracy, construct, evaluate	

Key skills (please also see the D&T skills progression document)		
	Designing	• Describe the purpose of their product. • Carry out research, using surveys, interviews, questionnaires and web based resources. • Identify needs wants, preferences and values of particular individuals and groups. • Use annotated sketches, cross sectional drawings and exploded diagrams to develop and communicate their ideas.
	Making	• Accurately apply a range of finishing techniques, including those from Art and Design with some accuracy. • Accurately measure, mark out, cut and shape materials and components. • Explain their choice of materials and components according to functional properties and aesthetic qualities.
	Evaluating	• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. • Evaluate their ideas against their original design specification.
	Technical knowledge	• The 3D textiles an be made from a combination of fabric shapes. • That a recipe can be adapted by adding or substituting one or more ingredients. • Use the correct technical vocabulary for the projects they are undertaking.

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Knowledge Overview – Design and Technology

	Autumn	Spring	Summer	Enhancements
Year 6	**Mechanisms – CAMS** • I can investigate a variety of pop up toys. • I can make observational drawing and ask questions to investigate how a product works. • I know the skills required to make a cam pop up toy. • I can design a pop up cam toy for a specific design brief. • I can construct a cam pop up toy. • I can evaluate my mechanism considering my design brief.	**Electrical Systems – Motor and control** • I know about technology that uses computer aided control. • I know a devices input, process and output. • I know the components used to support a Crumble controller. • I can design a colour spinner. • I can construct my colour spinner, using computer aided control. • I can evaluate my colour spinner.	**Food – Grab and go snacks** • I can identify 'on the go' product and their nutrients. • I can describe variety of 'on the go' products and look at their nutritional content. • I can follow a recipe to make a spring roll. • I can design an 'on the go' product. • I can make my 'on the go' product. • I can evaluate my 'on the go' product.	There are links with Electrical Systems and Computing. Children can prepare a 'grab and go snack' for the end of Year 6 celebration.
Vocabulary	Movement, mechanism, linear, rotary, oscillating, reciprocating, CAM, Observational drawing, investigate, product, mechanical system, input movement, output movement, measuring, marking, cutting, shaping, joining, junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills, design brief, questionnaires, audience, annotated drawings, construct, wooden frame, product, critically evaluate, manufacture, functionality, innovation.	Computer control, technology, devices, input, process, output, system, flow chart, Crumble controller, components, micro-USB cable, motor, bulb, crocodile leads, battery holder, colour spinner, patterns, colours, spiral, rotate, design, design brief, algorithm, construct, solve, fix, evaluate, effectiveness, skills	'On the go' product, characteristics, nutrients, protein, carbohydrates, sugars, fruit and vegetables, vitamins, fats, dairy, savoury, varied diet, sensory vocabulary, taste, texture, nutritional content, peel, grate, cut using the bridge hold and fork secure/claw grip, recipe, design criteria, hygiene, safety, evaluate, reflect	

Key skills (please also see the D&T skills progression document)	
Designing	• Generate innovative ideas, drawing on research. • Explain how particular parts of their products work. • Identify the needs, wants, preferences and values of particular individuals and groups.
Making	• Use techniques that involve a number of steps. • Demonstrate resourcefulness when tackling practical problems. • Explain their choices of tools and equipment in relation to the skills and techniques they will be using.
Evaluating	• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. • Evaluate their ideas and products against their original design specification.
Technical knowledge	• How mechanical systems such as cams create movement. • That mechanical and electrical systems have an input, process and output. • How to use learning from Science and Mathematics to help make and design products that work.