Sandy Lane Primary School Design and Technology Curriculum

Mission	**Taking PRIDE in all we do**					
Values	**PRIDE**	Positive	Responsible	Inclusive	Determined	Enquiring
	School Rules	Ready	Respectful	Safe		
Curriculum Intent - To Promote the 5 Values and school rules						

Design and Technology Intent

Our intentions in DT are for children to:

- Have a **positive** approach to designing, making and evaluating authentic products.
- Take **responsibility** for their own learning and challenge themselves to learn new skills and techniques within the key strands of DT.
- Understand how to work in an **inclusive** way, forming positive relationships when working collaboratively with a shared goal.
- To be **determined** when learning new and challenging skills, and finding solutions to design briefs.
- Follow an **enquiry,** stimulating creativity through a thoughtful design process.

It is our aim that children are given the knowledge, understanding and skills in order that our children become confident designers and can apply this to their projects. Knowledge and skills are taught progressively to ensure that all children make progress in this subject. Evaluation is an integral part of the design process and allows children to adapt and improve their product.
D&T allows children to apply their knowledge and skills learned in other subjects, in particular Maths, Science and Art.

Whenever children are designing and making products the following will be applied;

- **User** – children should have a clear idea of who they are designing and making products for, considering their needs, wants, interests or preferences. The user could be themselves, an imaginary character, another person, client, consumer or a specific target audience.
- **Purpose** – children should know what the products they design and make are for. Each product should perform a clearly defined task that can be evaluated in use.
- **Functionality** – children should design and make products that function in some way to be successful. Products often combine aesthetic qualities with functional characteristics. In D&T, it is insufficient for children to design and make products which are purely aesthetic.
- **Design Decisions** – when designing and making, children need opportunities to make informed decisions such as selecting materials, components and techniques and deciding what form the products will take, how they will work, what task they will perform and who they are for.
- **Innovation** – when designing and making, children need some scope to be original with their thinking. Projects that encourage innovation lead to a range of design ideas and products being developed, characterised by engaging, open-ended starting points for children's learning.
- **Authenticity** – children should design and make products that are believable, real and meaningful to themselves i.e. not replicas or reproductions or models which do not provide opportunities for children to make design decisions with clear users and purposes in mind.

There are three types of D&T activities;

• **Investigative and Evaluative Activities (IEAs)** where children learn from a range of existing products and find out about D&T in the wider world;
• **Focused Tasks (FTs)** where they are taught specific technical knowledge, designing skills and making skills;
• **Design, Make and Evaluate Assignment (DMEA)** where children create functional products with users and purposes in mind.

Sandy Lane school has adopted 'Projects on a page' a scheme of work produced by the Design & Technology Association.
The scheme is flexible and less prescriptive than other published schemes. Meaningful links are able to be made to other subject topics or themes as the project planners are context free.

The following areas are taught across the school in a progressive way. See the overview and progression of objectives which relate to each of these areas;

- **Mechanisms / Mechanical systems**
- **Structures**
- **Food**
- **Textiles**
- **Electrical systems**

Rationale for the sequence of units

Across KS1, lower KS2 and upper KS2 the children are taught units around the 6 key technical areas listed above. The children experience these areas between 3 and 5 times from Y1 to Y6.

The skills, knowledge and understanding taught is progressive over time.

Structures

In Y1 the children are introduced to basic structures using junk materials, this is built on in Y2 when 'shell structures' are taught. These are slightly more sophisticated and require a greater degree of accuracy when cutting out or drawing the 'net'. When 'shell structures' are returned to in Y4, the children have the opportunity to use computer added design (CAD). They therefore apply their introductory knowledge of shell structures and use IT as a tool to design and make these. Structures is then returned to in Y6. This time 'frame structures' are taught. An increasing degree of skill is required, particularly looking at different joining techniques and a variety of materials are also used.

Mechanisms

In KS1 basic mechanisms are introduced to the children, these are typical ones that children may experience with their toys at home. The children therefore leave KS1 being able to make sliders, levers, wheels and axels.

In lower KS2, two more concepts are introduced, pneumatics and levers and linkages. Levers and linkages in particular builds on the learning of sliders and levers.

In upper KS2 a further aspect is now introduced, 'cams'. 'Cams' builds on learning from wheels and axles.

Pulleys and gears is a new area of learning, introduced in UKS2. Motorising a wheeled vehicle builds on from a simple wheeled vehicle in KS1.

Food

In KS1 Food is introduced to Y1 children. Very simple projects involving fruit and vegetables are created, none of which require cooking. In lower KS2 the children's design skills are developed further as part of their designs they plan to assemble a number of ingredients together to form a particular product.

In upper KS2 Food is now linked to a particular theme, requiring designs that are more sophisticated. Cooking is also required for some of the products produced.

Electrical Systems

Electrical systems are first introduced in lower KS2, linking closely to the knowledge already gained form the Science curriculum. Simple switches and circuits are used in the designs which leads to more complex switches and circuits in upper KS2, perhaps including more than one input and possibly a parallel circuit.

Textiles

Templates and simple joining techniques are used in KS1. These are built on in lower KS2 where 3D products are first introduced, using 2D templates and designs. Combining different fabrics and therefore producing a more sophisticated product moves learning on further in upper KS2.

Disciplinary Knowledge in Primary D&T

Disciplinary knowledge is about understanding how knowledge is created and used in the subject. In D&T, it's about thinking and behaving like a designer or engineer. It involves:

- Design thinking: researching, planning, prototyping, evaluating, and iterating.
- Problem-solving: applying knowledge creatively to meet a design brief.
- Evaluative skills: testing and reflecting on a product's fitness for purpose.
- Critical thinking: asking "Why did this work?" or "How could this be improved?"

This type of knowledge supports how children use and apply what they've learned to engage in the processes and practices of D&T.

Substantive Knowledge in Primary D&T

Substantive knowledge refers to the factual, procedural, and conceptual knowledge that pupils are expected to learn about the subject. In primary D&T, this includes:

- Technical knowledge: e.g. how mechanisms like levers, pulleys, and gears work.
- Materials knowledge: properties of materials (wood, plastic, fabric) and their uses.
- Tools and processes: knowing how to use scissors, saws, glue guns, etc., safely and effectively.
- Vocabulary: terms such as "prototype," "structure," "mechanism," "evaluation."
- Cooking and nutrition: understanding where food comes from, the eatwell plate, and basic food prep skills.

This is the "stuff" that can be taught and learned – the facts, concepts, and techniques that make up the body of knowledge in D&T.

2025 - 2026

	Autumn	Spring	Summer
Y1	Mechanisms Sliders & Levers	Structures Free standing structures	Food Preparing fruit / veg Fruit smoothies / soup
Y2	Mechanisms Wheels & axles	Structures Shell structures	Textiles Templates & joining (puppets)
Y3	Mechanisms Levers & Linkages	Textiles 2D shape to 3D product (bags)	Food Healthy & varied diet Pitta pizzas
Y4	Mechanisms Pneumatics	Electrical systems Simple circuits and switches	Structures Shell structures (with CAD)
Y5	Mechanisms Cams	Food Celebrating culture	Textiles Combining different fabrics
Y6	Mechanisms Gears and Pulleys	Electrical systems Complex circuits	Structures Frame structures

From
2025 - 2026 Y4 & Y6 replace their Autumn unit. One will be replaced with;

Y4 - Pneumatics
Y6 - Gears & pulleys

BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design		Develop own ideas and decide which materials to use for a purpose. (Nursery) Plan and create a design using various joins (Reception)		• Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment. • State what products they are designing and making • Say whether their products are for themselves or other users • Describe what their products are for • Say how their products will work • Say how they will make their products suitable for their intended users. • Use simple design criteria to help develop their ideas		• Gather information about the needs and wants of particular individuals and groups • Develop their own design criteria and use these to inform their ideas		• Carry out research, using surveys, interviews, questionnaires and web-based resources • Identify the needs, wants, preferences and values of particular individuals and groups • Develop a simple design specification to guide their thinking	
						• Work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and wider environment • Describe the purpose of their products • Indicate the design features of their products that will appeal to intended users • Explain how particular parts of their products work			

BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making	***Planning***	Explore different materials freely in order to develop ideas about how to use them and what to make Develop their own ideas and then decide which materials to use	Return to and build upon their previous learning, refining ideas Experiment with colour, design, texture, form and function	• Plan by suggesting what to do next • Select from a range of tools and equipment, explaining their choices • Select from a range of materials and components according to their characteristics		• Order the main stages of making		• Produce appropriate lists of tools, equipment and materials that they need • Formulate step-by-step plans as a guide to making	
						• Select tools and equipment suitable for the task • Explain their choice of tools and equipment in relation to the skills and techniques they will be using • Select materials and components suitable for the task • Explain their choice of materials and components according to functional properties and aesthetic qualities			
	Practical skills and techniques	Select and use activities and resources to achieve a goal Make imaginative and complex	Develop their small motor skills to use a range of tools Explore, use and refine a variety of artistic effects to	• Follow procedures for safety and hygiene • Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • Measure, mark out, cut and shape materials and components		• Measure, mark out, cut and shape materials and components with some accuracy • Assembly, join and combine materials and components with some accuracy		• Accurately measure, mark out, cut and shape materials and components • Accurately assemble, join and combine materials and components • Accurately apply a range of finishing techniques, including those from art and design • Use techniques that involve a number of steps	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			'small worlds' Create closed shapes with continuous lines, begin to represent objects Use one-handed tools e.g. scissors	Express ideas and feelings Create collaboratively, sharing ideas and resources ,	• Assemble, join and combine materials and components • Use finishing techniques, including those from art and design		• Apply a range of finishing techniques, including those from art and design, with some accuracy		• Demonstrate resourcefulness when tackling practical problems	
							• Follow procedures for safety and hygiene • Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components			
	Cooking and nutrition	***Where food comes from***	They may engage in activities like planting seeds or observing the life cycle of plants (e.g., growing vegetables), linking food to its natural sources.	Children learn more about the journey of food, from farm to table, by exploring different types of food (e.g., fruits, vegetables, grains, and meats) and how they are produced. They may engage in discussions	• That all food comes from plants or animals • That food has to be farmed, grown elsewhere (e.g home) or caught		• That food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world		• That seasons may affect the food available • How food is processed into ingredients that can be eaten or used in cooking	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				about animals and plants that provide the foods they eat.						
		Food, cooking and nutrition	Beginning to understand the difference between healthy and unhealthy foods. Making healthy choices about food, drink Encouraged to participate in food preparation activities, such as making simple snacks.	Developing independence in making healthy choices and serving themselves.	• How to name and sort foods into the five groups in The Eatwell plate • That everyone should eat at least 5 portions of fruit and vegetables every day • How to prepare simple dishes safely and hygienically, without using a heat source • How to use techniques such as cutting, peeling and grating		• That a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plate • That to be active and healthy, food and drink are needed to provide energy for the body		• That recipes can be adapted to change the appearance, taste, texture and aroma • That different food and drink contain different substances – nutrients, water and fibre – that are needed for health	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Evaluation	***Own ideas and products***		Share their creation, explaining the process they have used	• Talk about their design ideas and what they are making • Make simple judgements about their products and ideas against design criteria • Suggest how their products could be improved		• *Identify the strengths and areas for development in their ideas and products* • *Consider the views of others, including intended users, to improve their work* • Refer to their design criteria as they design and make • Use their design criteria to evaluate their completed products		• *Identify the strengths and areas for development in their ideas and products* • *Consider the views of others, including intended users, to improve their work* • 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	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Existing products			• What products are • Who products are for • What products are for • How products work • How products are used • Where products might be used • What materials products are made from • What they like and dislike about products		• *How well products have been designed* • *How well products have been made* • *Why materials have been chosen* • *What methods of construction have been used* • *How well products work* • *How well products achieve their purposes* • *How well products meet user needs and wants* • Who designed and made the products • Where products		• *How well products have been designed* • *How well products have been made* • *Why materials have been chosen* • *What methods of construction have been used* • *How well products work* • *How well products achieve their purposes* • *How well products meet user needs and wants* • How much products cost to make • How innovative products are	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							were designed and made • When products were designed and made			
	Technical Knowledge				• About the simple working characteristics of materials and components • About the movement of simple mechanisms such as levers, sliders, wheels and axles • How freestanding structures can be made stronger, stiffer and more stable • That a 3D textiles product can be assembled from two identical fabric shapes • That food ingredients should be combined according to their sensory characteristics • The correct technical vocabulary for the products they are undertaking		• How to use learning from science to help design and make products that work • How to use learning from mathematics to help design and make products that work • That materials have both functional properties and aesthetic qualities • That materials can be combined and mixed to create more useful characteristics • That mechanical and electrical systems have an input, process and output • The correct technical vocabulary for the projects they are undertaking		
							• How mechanical systems such as levers and linkages or pneumatic systems create movement • How simple electrical circuits and components		• How mechanical systems such as cams or pulleys or gears create movement • How more complex electrical circuits and components can be used to create functional products • How to program a computer to monitor changes in the	

	BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							can be used to create functional products ● How to program a computer to control their products ● How to make strong, stiff shell structures ● That a single fabric shape can be used to make a 3D textiles product ● That food ingredients can be fresh, pre-cooked and processed		environment and control their products ● How to reinforce and strengthen a 3D framework ● That a 3D textiles product can be made from a combination of fabric shapes ● That a recipe can be adapted by adding or substituting one or more ingredients	

BIG IDEAS	Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Diversity *To be implemented in 2025-26*		• Begin to understand that people make things and meet a range of designers from around the world		• Understand that people make things and meet a range of designers from around the world, from a range of backgrounds from around the world.		• About inventors, designers, engineers, chiefs and manufacturers who have developed ground-breaking products (including people from a range of backgrounds)			
Environment and Sustainability *To be implemented in 2025-26*		• Begin to explore natural materials and their properties. • Understand basic concepts of waste, such as reusing and recycling simple materials in play. • Develop curiosity about the environment and how materials are sourced (e.g., wood from trees). • Participate in simple discussions about looking after the world.		• Recognise the difference between natural and man-made materials. • Learn about basic recycling and how different materials can be reused. • Understand the importance of looking after resources and avoiding waste. • Explore sustainable materials in simple design projects (e.g., using recycled cardboard to create models). • Begin to discuss the impact of littering and pollution on the environment.		• Identify different types of sustainable and non-sustainable materials. • Explore how products are made and their impact on the environment. • Understand the concept of the 3Rs (Reduce, Reuse, Recycle) and apply them in projects.		• How sustainable the materials in products are • What impact products have beyond their intended purposes • Discuss innovations in sustainability, such as biodegradable plastics and renewable energy in design.	

EYFS Curriculum: Design and Technology	
Birth to three	UTW:Explore natural materials, indoors and outside. Explore materials with different properties. EAD: Explore different materials, using all their senses to investigate them. Manipulate and play with different materials. Use their imagination as they consider what they can do with different materials. Make simple models which express their ideas. PD: Build independently with a range of appropriate resources.
3 and 4-year-olds	PSED: Select and use activities and resources, with help when needed. . This helps them to achieve a goal they have chosen, or one which is suggested to them. PD: Use large-muscle movements to wave flags and streamers, paint and make marks.Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel. Use one-handed tools and equipment, for example, making snips in paper with scissors. UTW: Explore how things work. EAD: Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. Explore different materials freely, to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Create closed shapes with continuous lines and begin to use these shapes to represent objects.
Children in reception	PD: Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or on the floor. EAD: Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.
ELG	PD (FM)- Use a range of small tools, including scissors, paintbrushes and cutlery. EAD- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, splaining the process they have used.

EYFS	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery ***Creating with Materials*** *DME* *Tools & Techniques*	To be able to use colour in a variety of ways, for example combining colours **STRUCTURES** To be able to use 3D and 2D structures to explore materials, textures and/or to express ideas	To be able to use media and materials to represent and express an idea. To be able to explore colour and how colours can be changed. **STRUCTURES** To be able to use various construction materials, e.g. joining pieces, stacking vertically and horizontally, balancing, making enclosures and creating spaces	**STRUCTURES** To be able to use a variety of materials to construct for a purpose. To be able to use shapes to represent objects. To be able to create closed shapes with continuous lines. Use drawing to represent movement or loud noises.	To be able to develop own ideas and decide which materials to use for a purpose To be able to understand using lines to enclose a space, and begins to use drawing to represent actions and objects based on imagination, observation and experience	To be able to explore a range of different materials to develop own ideas To be able to draw with increasing complexity and detail such as a head and body	To be able to use tools and techniques to enhance and add detail to their representations. To be able to join different materials with glue and sellotape. To be able to draw with increasing complexity and detail such as a face. (Including showing emotions.)
Nursery ***The natural world*** Food	**Summer 1** DT Where food comes from and related to growing They may engage in activities like planting seeds or observing the life cycle of plants (e.g., growing vegetables), linking food to its natural sources. Beginning to understand the difference between healthy and unhealthy food. Making healthy choices about food, Encouraged to participate in food preparation activities, such as making simple snacks.					

EYFS	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception ***Creating with Materials*** *DME* *Tools & Techniques*	To be able to select appropriate tools for different techniques including paint brush, glue spreaders, rollers and stamps. To be able to experiment with colour and colour mixing and explain reasons for choices. To be able to explore, use and refine a variety of artistic effects to express their ideas and feelings. To be able to use a variety of techniques to create including paint, collage**, junk modelling**, dough, drawing, etc.	To be able to match colours for a purpose. To be able to join materials with Sellotape and glue. To know the names of different tools and techniques that can be used to create art.ie painting, collage On going To be able to talk about the changes they can see when they explore colour mixing.	To be able to safely use and explore a variety of materials, tools and techniques, including scissors, sponges, palettes, etc. To be able to experiment with design, form and function. On going	To be able to create collaboratively, sharing ideas, resources and skills. To plan and create a design using various joins ie paper clips, butterfly clips, elastic bands To be able to share their creations explaining processes used reflecting back to their original design.	To be able to make changes to creative work to make improvements and explain their choices. To be able to select tools and techniques needed to shape, assemble and join materials they are using. To be able to share creations, talk about processes and evaluate their work.	To be able to use what they have learnt about media and materials in original ways, thinking about uses and purposes. To be able to use a variety of techniques to create including paint, collage, junk modelling, dough, drawing, etc. To be able to share creations, talk about processes and evaluate their work.
Reception *The Natural World* Food	**Summer 1** Children learn more about the journey of food, from farm to table, by exploring different types of food (e.g., fruits, vegetables, grains, and meats) and how they are produce They may engage in discussions about animals and plants that provide the foods they eat. Developing independence in making healthy choices and serving themselves.					

STRUCTURES				
	Y1	**Y2**	**Y3**	**Y5**
TITLE	**Free standing structures**	**Shell Structures**	**Shell structures (with CAD)**	**Frame Structures**
Prior Learning	• *Experience of using construction kits to build walls, towers and frameworks.* • *Experience of using basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.* • *Experience of different methods of joining card and paper.*	• *Experience of using different joining, cutting and finishing techniques with paper and card.* • *A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science.*	• *Experience of using different joining, cutting and finishing techniques with paper and card.* • *A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science.* • *Familiarity with general purpose software that can be used to draw accurate shapes, such as Microsoft Word/Google Docs, or simple computer-aided design (CAD), such as 2D Primary by Techsoft.* • *Experience of making a basic net using paper /card*	• *Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials.* • *Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.*
Designing	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings.	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.	• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.
Making	• Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and	• Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.	• Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials	• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.

STRUCTURES				
	reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.	• Explain their choice of materials according to functional properties and aesthetic qualities. • Use finishing techniques suitable for the product they are creating.	according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating.	• Use finishing and decorative techniques suitable for the product they are designing and making.
Evaluating	• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.	• Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	• Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	• Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.
Substantive knowledge **(Technical Knowledge)**	• Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.	• Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project.	• Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Develop and use knowledge of how to construct strong, stiff shell structures. • Know and use technical vocabulary relevant to the project. •Technical knowledge of navigating around specific computer software	• Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.
Vocabulary	cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder design,	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, scoring, shaping, tabs, adhesives, joining,	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional

STRUCTURES				
	make, evaluate, user, purpose, ideas, design criteria, product, function			

MECHANISMS					
	Y1	**Y2**	**Y4**	**Y5**	**Y6**
TITLE	**Sliders & Leavers**	**Wheels & axles**	**Levers and linkages**	**Pulleys or Gears**	**Cams**
Prior Learning	• *Early experiences of working with paper and card to make simple flaps and hinges.* • *Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.*	• *Assembled vehicles with moving wheels using construction kits.* • *Explored moving vehicles through play.* • *Gained some experience of designing, making and evaluating products for a specified user and purpose.* • *Developed some cutting, joining and finishing skills with card.*	• *Explored and used mechanisms such as flaps, sliders and levers.* • *Gained experience of basic cutting, joining and finishing techniques with paper and card.*	• *Experience of axles, axle holders and wheels that are fixed or free moving.* • *Basic understanding of electrical circuits, simple switches and components.* • *Experience of cutting and joining techniques with a range of materials including card, plastic and wood.* • *An understanding of how to strengthen and stiffen structures.*	• *Experience of axles, axle holders and wheels that are fixed or free moving.* • *Basic understanding of different types of movement.* • *Experience of cutting and joining techniques with a range of materials including card, plastic and wood.* • *An understanding of how to strengthen and stiffen structures.*
Designing	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.	• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.	• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.
Making	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut,	• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.

MECHANISMS					
	shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating.	finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	join paper and card. • Select from and use finishing techniques suitable for the product they are creating.	tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.	• Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.
Evaluating	• Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	• Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	• Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.	• Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.
Substantive knowledge **(Technical Knowledge)**	• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.	• Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.	• Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.	• Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement.
Vocabulary	slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards	vehicle, wheel, axle, axle holder, chassis, body, cab, assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used	mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function prototype, design	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams mechanical system, electrical system, input, process, output design	cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion annotated sketches, exploded

MECHANISMS					
	design, make, evaluate, user, purpose, ideas, design criteria, product, function	design, make, evaluate, purpose, user, criteria, functional	criteria, innovative, appealing, design brief	decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	diagrams mechanical system, input movement, process, output movement design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

FOOD				
	Y1	**Y3/4**	**Y4**	**Y6**
TITLE	**Fruit smoothies (fruit & veg)**	**Pitta Pizza (including healthy options)**	**Fruit crumble (including healthy options)**	**Celebrating culture and seasonality Bread**
Prior Learning	• *Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.* • *Experience of cutting soft fruit and vegetables using appropriate utensils.*	• *Know some ways to prepare ingredients safely and hygienically.* • *Have some basic knowledge and understanding about healthy eating and The eatwell plate.* • *Have used some equipment and utensils and prepared and combined ingredients to make a product.*		• *Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet.* • *Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients.*
Designing	• Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings.	• Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.		• Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.
Making	• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of fruit	• Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food		• Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.

FOOD				
	and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.	products, thinking about sensory characteristics.		• Make, decorate and present the food product appropriately for the intended user and purpose.
Evaluating	• Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose.	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.		• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.
Substantive knowledge **(Technical Knowledge)**	• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The eatwell plate*. • Know and use technical and sensory vocabulary relevant to the project.	• Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.		• Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.
Vocabulary	fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating	Pitta bread, Wholemeal, Herbs Spices, Toppings, Cheese, Vegetables, Protein, Dairy, Sauce, Seasoning, Cooking &:, Slice, Chop, Dice, Grate , Spread, Layer, Assemble, Grill, Chopping board, Knife, Grater	fruit, seasonal produce, apple, berries, rhubarb, sugar, butter, flour, oats, cinnamon, nutmeg, and syrup. peeling, coring, slicing, chopping, dicing, weighing, measuring, using the rub-in method, mixing, stirring, sprinkling, and baking. chopping board, knife, peeler, mixing bowl, baking dish, measuring	ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble design specification, innovative, research, evaluate, design brief

FOOD				
	tasting, arranging, popular, design, evaluate, criteria	Spoon, Oven, Baking tray, Mixing bowl Ingredients selection Texture, Flavour, Appearance Healthy eating, Balanced diet	scales, oven, and spoon. oven gloves,. texture, flavour, sweetness, crumbliness, crunchiness, achieving a golden brown finish, considering a balanced diet, and making healthy adaptations.	

TEXTILES				
	Y2	**Y3**	**Y5**	**Y6**
TITLE	**Templates & joining techniques** ***glove puppet***	**2D shape to 3D products** ***bag***	**Combining different fabric shapes**	**Using CAD in textiles**
Prior Learning	• *Explored and used different fabrics.* • *Cut and join fabrics with simple techniques.* • *Thought about the user and purpose of products.*	• *Have joined fabric in simple ways by glueing and stitching.* • *Have used simple patterns and templates for marking out.* • *Have evaluated a range of textile products.*	• *Experience of basic stitching, joining textiles and finishing techniques.* • *Experience of making and using simple pattern pieces.*	• *Experience of stitching, joining and finishing techniques in textiles.* • *Experience of making and using textiles pattern pieces.* • *Experience of simple computer-aided design applications.*
Designing	• Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	• Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	• Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design. • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.	• Generate innovative ideas through research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes including using computer-aided design. • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.
Making	• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use	• Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings	• Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that	• Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment, including CAD, to make

TEXTILES				
	textiles according to their characteristics.	according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.	are accurately assembled and well finished. Work within the constraints of time, resources and cost.	products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.
Evaluating	• Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.	• Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	• Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.	• Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work
Substantive knowledge **(Technical Knowledge)**	• Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. • Know and use technical vocabulary relevant to the project.	• Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.

TEXTILES				
Vocabulary	names of existing products, joining and finishing techniques, tools, fabrics and components template, pattern pieces, mark out, join, decorate, finish features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function	fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces	seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype	computer aided design (CAD), computer aided manufacture (CAM) font, lettering, text, graphics, menu, scale, modify, repeat, copy, flip design brief, design criteria, design decisions, innovative, prototype seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces names of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper annotate, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

ELECTRICAL SYSTEMS		
	Year 4	**Year 6**
TITLE	***Simple Circuits (torch)***	***Monitoring & Control***
Prior Learning	• *Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers. (NOTE - Science Y4 Electricity unit must be taught first or at the same time)* • *Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.*	• *Initial experience of using computer control software and an interface box, a standalone box or microcontroller, e.g. Crumble.* • *Some experience of writing and modifying a program to make a light turn on or flash on and off.* • *Understanding of the essential characteristics of a series circuit and experience of creating a battery powered, functional, electrical product.*
Designing	• Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.	• Develop a design specification for a functional product that responds automatically to changes in the environment. • Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.
Making	• Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. • Create and modify a computer control program to enable their electrical product to respond to changes in the environment.
Evaluating	• Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose.
Substantive knowledge **(Technical Knowledge)**	• Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project.	• Understand and use electrical systems in their products. • Understand the use of computer control systems in products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.

ELECTRICAL SYSTEMS		
Vocabulary	series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, light emitting diode (LED), bulb, bulb holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, process user, purpose, function, prototype, design criteria, innovative, appealing, design brief	reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, parallel circuit function, innovative, design specification, design brief, user, purpose