Phase	Cycle	Skill	Topic	Intent
KS1	1	**Structures: Freestanding Structures**	Playgrounds **Outcome**: To design, make and evaluate a free standing playground structure.	**Prior learning (EYFS)** • Experience of using construction kits to build walls, towers and frameworks. • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. • Experience of different methods of joining card and paper. **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. **Making** • Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating. **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. **Technical knowledge and understanding** • Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project. *Next steps: Structures: Shell structures using CAD*
KS1	1	**Mechanisms: Wheels and axels**	Transport	**Prior learning (EYFS)** • 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. **Designing** • Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.

			Outcome: To design, make and evaluate a product that has wheels and axels to make it move.	**Making** • Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics. **Evaluating** • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria. **Technical knowledge and understanding** • Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project. *Next steps: Mechanical systems: Levers and Linkages & Mechanical systems: Pneumatics*
KS1	1	**Textiles: Templates and joining techniques**	Puppets **Outcome**: To design, make and evaluate a puppet using templates and simple pattern pieces.	**Prior learning (EYFS)** • Explored and used different fabrics. • Cut and joined fabrics with simple techniques. • Thought about the user and purpose of products. **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. **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 textiles according to their characteristics. **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. **Technical knowledge and understanding** • 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. *Next steps:Textiles: 2-D shape to 3-D shape product*

KS1	2	**Mechanisms: Sliders and Levers**	Moving pictures **Outcome**: To design, make and evaluate a product that incorporates sliders and levers.	**Prior learning (EYFS)** • 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. **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. **Making** • Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating. **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. **Technical knowledge and understanding** • Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project. *Next steps: Mechanical systems: Levers and Linkages & Mechanical systems: Pneumatics*
KS1	2	**Food: Preparing fruits and vegetables**	Fruit salad/ fruit kebabs	**Prior learning (EYFS)** • 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. **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. **Making** • Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.

			Outcome: To design, make and evaluate a fruit and vegetable snack for a class picnic.	• Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. **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. **Technical knowledge and understanding** • 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 eat well plate*. • Know and use technical and sensory vocabulary relevant to the project. *Next steps*: *Food: Healthy and Varied Diet* *Further NC Links: PSHE Healthy Eating*
LKS2	1	**Electrical systems: Simple circuits and switches**	Night lights **Outcome**: To design, make and evaluate a simple battery powered electrical circuit.	**Prior learning (KS1)** • Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers. • Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. **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. **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. **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. **Technical knowledge and understanding** • 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. *Next steps: Electrical Systems: More Complex switches and circuits.* *Further NC Links: LKS2 Science- Electricity*

LKS2	1	**Mechanical systems: Pneumatics**	Toys **Outcome**: To design, make and evaluate a product that uses pressurised air for mechanical motion.	**Prior learning (KS1)** • Explored simple mechanisms, such as sliders and levers, and simple structures. • Learnt how materials can be joined to allow movement. • Joined and combined materials using simple tools and techniques. **Designing** • Generate realistic and appropriate 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. **Making** • Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. • Select from and use finishing techniques suitable for the product they are creating. **Evaluating** • Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make. **Technical knowledge and understanding** • Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project. *Next steps :Mechanical Systems: Pulleys or Gears & Mechanical systems: Cams*
LKS2	1	**Food: Healthy and varied diet**	Bread	**Prior learning (KS1)** • 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. **Designing** • 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. **Making** • Plan the main stages of a recipe, listing ingredients, utensils and equipment.

			Outcome: To design, make and evaluate a bread based product with a filling for lunch.	• Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. **Evaluating** • 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. **Technical knowledge and understanding** • 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. *Next steps: Food: Celebrating culture and seasonality* *Further NC Links: PSHE Healthy Eating*
LKS2	2	**Mechanical systems: Levers and linkages**	Pop- up cards **Outcome**: To design, make and evaluate a card with moving parts	**Prior learning (KS1)** • Explored and used mechanisms such as flaps, sliders and levers. • Gained experience of basic cutting, joining and finishing techniques with paper and card. **Designing** • 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. **Making** • Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating. **Evaluating** • 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. **Technical knowledge and understanding** • Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project. *Next steps: Mechanical Systems: Pulleys or Gears & Mechanical systems: Cams*

LKS2	2	**Structures: Shell structures using computer aided design (CAD)**	Packaging/ shell str uctures **Outcome**: To design, make and evaluate a CAD- based packaging to protect and display a food product	**Prior learning (KS1)** • 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, or simple computer-aided design (CAD), such as 2D Primary by Techsoft. **Designing** • 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. **Making** • 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 according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating. **Evaluating** • 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. **Technical knowledge and understanding** • 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. *Next steps: Structures: Frame Structures*
LKS2	2	**Textiles: 2-D shape to 3-D product**	Stitching	**Prior learning (KS1)** • Have joined fabric in simple ways by gluing and stitching. • Have used simple patterns and templates for marking out. • Have evaluated a range of textile products. **Designing** • 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. **Making** • Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.

			Outcome: To design, make and evaluate a holder/purse/wallet taking a 2-D shape to a 3-D product.	• Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. **Evaluating** • 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. **Technical knowledge and understanding** • 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. *Next steps: UKS2 Textiles: Combining different fabric shapes* *Further NC Links: LKS2 Art- Textiles and Printing*
UKS2	1	**Electrical systems: More complex switches and circuits**	Input and Output **Outcome**: To design, make and evaluate an alarm using more complex switches and circuits	**Prior learning (LKS2)** • Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product. • Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off. **Designing** • Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. • Generate and develop innovative ideas and share and clarify these through discussion. • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. **Making** • 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 an electrical product to work automatically in response to changes in the environment. **Evaluating** • 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. • Investigate famous inventors who developed ground-breaking electrical systems and components. **Technical knowledge and understanding** • Understand and use electrical systems in their products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project. *Further NC Links: UKS2 Science- Electricity*
UKS2	1	**Mechanical systems: Cams**	Enterprise (To create a product to sell).	**Prior learning (KS1 & LKS2)** • 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 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** • 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 tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Evaluating** • 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. **Technical knowledge and understanding** • 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. • Know and use technical vocabulary relevant to the project.
			Outcome: To design, make and evaluate a moving product using a cam mechanism.	
UKS2	2	**Mechanical systems: Pulleys or Gears**	Enterprise (To create a product to sell)	**Prior learning (KS1 & LKS2)** • 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. **Designing** • 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** • 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 tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Evaluating** • 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.
			Outcome: To design, make and evaluate a product that incorporates gears or pulleys	

				• Investigate famous manufacturing and engineering companies relevant to the project. **Technical knowledge and understanding** • 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.
UKS2	2	**Textiles: Combining different fabric shapes**	Stitching to Combine different fabric shapes **Outcome**: To design, make and evaluate a mobile phone case/cover (linked with art collage project).	**Prior learning (KS1 & LKS2)** • Experience of basic stitching, joining textiles and finishing techniques. • Experience of making and using simple pattern pieces. **Designing** • 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. **Making** • 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 are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Evaluating** • 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. **Technical knowledge and understanding** • 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. *Further NC Links: UKS2 Art: Textile and Digital Media*
UKS2	2	**Structures: Frame structures**	Anderson shelters	**Prior learning (KS1 & LKS2)** • 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** • 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.

			Outcome: To design, make and evaluate an Anderson shelter using straws or wood.	• Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. **Making** • 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. • Use finishing and decorative techniques suitable for the product they are designing and making. **Evaluating** • 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. **Technical knowledge and understanding** • Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.
UKS2	2	**Food: Celebrating culture and seasonality**	Ancient Mayan's	**Prior learning (KS1 & LKS2)** • 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** • 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.
			Outcome: To design, make and evaluate a chocolate recipe demonstrating how to measure out, cut, shape and combine.	**Making** • 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. • Make, decorate and present the food product appropriately for the intended user and purpose. **Evaluating** • 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. **Technical knowledge and understanding** • 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.

				Further NC Links: UKS2 History- The Mayan civilisation

Implementation	**Whole school-** **Skills Walls:** DT Skills Wall within school focuses on key skills, vocabulary and questions and exemplify the terminology used throughout the teaching of DT and enable pupils to make links across the wider curriculum. **Subject specific vocabulary:** Identified through Projects on a Page scheme of work and highlighted to the children at the beginning of lessons. Relevant DT vocabulary based on each topic are available on mats for children to use in every lesson. **Consistent teaching sequence:** DT lessons will follow a clear and consistent teaching sequence allowing children to develop their skills in DT throughout the unit. **Learning environment:** The learning environment is designed to ensure children develop their DT skills and knowledge and continue to know more and remember more. Teachers will make reference to the DT vocabulary mats/posters during lessons and at other regular times during the week. **KS1 –** Over the two-year cycle, skills relating to all DT topics will be covered (Electrical Systems is only taught once children are in KS2). Skills will often be cross-curricular linked, with DT skills, aims and outcomes being incorporated into related topics being taught. **LKS2-** Over the two-year cycle, skills relating to all DT topics will be covered. Skills will often be cross-curricular linked, with DT skills, aims and outcomes being incorporated into related topics being taught. **UKS2 –** Over the two-year cycle, skills relating to all DT topics will be covered. Skills will often be cross-curricular linked, with DT skills, aims and outcomes being incorporated into related topics being taught.
Impact	By the end of KS2, children will know more, remember more and understand more about each D.T theme. They will develop knowledge of the skills they need to create a variety of their own products, being able to choose and use the utensils necessary in order to do so. This will include the use of computer aided design where appropriate. They will have developed the skills required to investigate, then independently design, make and evaluate their creations. They will have built upon the skills taught throughout their time at primary school and continue to develop those skills in KS3 and beyond.