Design and Technology

Whole School Progression Document

SHARLSTON
COMMUNITY SCHOOL

Design and Technology in the Early Years

Nursery

Throughout the year, children will develop their own ideas and will decide what materials they need to express them. Children talk to adults about what they want to create and adults skillfully model and offer suggestions to extend/support the children as required. Children have free access to materials and tools, such as scissors, glue, paper clips and fastenings that they may need to make their ideas.

	Term 1	**Term 2**	**Term 3**
Development Matters	To show a preference for a dominant hand. To use one handed tools and equipment. To join materials.	To use one handed tools and equipment. To join different materials and explore different textures. To explore different materials freely, to develop their ideas about how to use them and what to do.	To explore different materials freely, to develop their ideas about how to use them and what to do. To make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.
Skill	To cut using tools. To join materials. To join materials in different ways. **In weekly baking/cooking:** To peel using tools to cut, spread, mix and peel food.	To my imagination to build. To talk about my ideas. To cut using tools. To join materials. To join materials in different ways. To make a simple model **In weekly baking/cooking:** To peel using tools to cut, spread, mix and peel food.	To use my imagination to build. To talk about my ideas. To use my senses to explore different materials. To make models for specific purposes. To choose the most effective materials, tools and techniques for a purpose. To explain my choices. To work with my friends. **In weekly baking/cooking:** To peel using tools to cut, spread, mix and peel food.
Knowledge	As Designers, hold scissors and a hole punch correctly. As Designers, make snips with scissors. As Designers, use scissors to cut along a straight line. As Designers, join paper together using glue and tape.	As Designers, hold scissors correctly. As Designers, use scissors and a hole punch correctly. As Designers, use scissors to cut out a shape. As Designers, join 3D containers and boxes together using glue and tape to create a model.	As Designers, join 3D containers and boxes together using glue and tape to create a model. As Designers, understand that strong and stable models need to have bigger and heavier blocks/boxes at the bottom. As Designers, use blocks and materials to create a small world seaside town or village.
Vocabulary	Scissors Hole punch Glue Tape Hold Open and close Press Push Snips Cut Safe Join Overlap	Scissors Hole punch Glue Tape Hold Open and close Press Push Snips Cut Safe Join Overlap Model 3D	Join Overlap Model 3D Glue Tape Build Blocks Biggest Heaviest Bottom Strong Secure

Reception

Reception will continue to access their continuous provision where they can independently use resources, practise skills and display knowledge and understanding of design and technology principles. Adults in the foundation stage unit will facilitate and model skills, as well as providing the resources, materials and equipment the children require. Adults will continue to model how to use resources, materials and equipment accordingly through allocated provision time.

There will be some enhancement and focused teaching to ensure design and technology skills are being taught and implemented effectively. These adult-led projects will occur throughout the year and adults will teach by modelling the activity and provide support for the child to independently apply skills in their allocated provision time.
In the EYFS, we often go with the child's interests and so children choose and select their own materials and resources, as well as identifying a product to create. Adults in the provision may also model and encourage skills/products to make, to move learning forward.

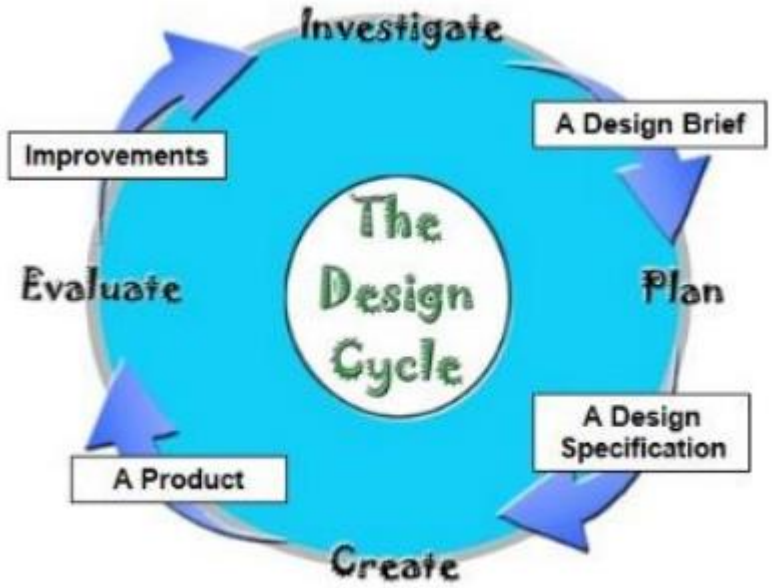
	Term 1	**Term 2**	**Term 3**
Development Matters	To develop their small motor skills so that they can use a range of tools competently, safely and confidently. To explore different materials freely, to develop their ideas about how to use them and what to do. To return to and build on their previous learning, refining ideas and developing their ability to represent them.	To develop their small motor skills so that they can use a range of tools competently, safely and confidently. To return to and build on their previous learning, refining ideas and developing their ability to represent them.	To create collaboratively, sharing ideas, resources and skills. To safely use and explore a variety of materials, tools and techniques, experimenting with design, texture, form and function. (ELG) To share their creations, explaining the process they have used.
Skill	To use my imagination to build. To talk about my ideas. To use my senses to explore different materials. To make models for specific purposes. To join materials in different ways. To choose the most effective materials, tools and techniques for a purpose. To explain my choices. To work with my friends.	To hold mark making tools with increasing control. To plan and design a product. To talk about my ideas. To join materials in different ways. To explain my choices. To work with my friends. To choose the most effective materials, tools and techniques for a purpose. To choose techniques and apply them. To use cutting skills safely. To fold and join paper.	To plan and design a product. To talk about my ideas. To choose techniques and apply them confidently. To use tools safely. To select effective tools, To talk about my work and justify my choices. To work cooperatively.
Knowledge	As Designers, understand that strong and stable models need to have bigger and heavier blocks/boxes at the bottom. As Designers, learn the skill of overlapping to make structures strong and stable. As Designers, investigate different joining techniques to allow paper to be secure (glue, tape, staple) and to move (treasury tag, split pin)	As Designers -share their ideas about how they will make a part of their puppet move. -draw a design of a puppet with a moving part and identify tools and resources needed to make it. -using drawing, cutting and joining skills to make a puppet that has a moving part. -apply finishing techniques to their puppet. - learn about **Margaret Knight, the first woman to design a paper bag**. Learn that she was from America and went on to founder the Eastern Paper Bag Company. Learn to fold and glue paper to make a paper bag.	As Designers, use the skill of overlapping to make 3D structures strong and secure. As Designers, work collaboratively to design and build 3D models of Tower bridge in London, using a range of resources and the skill of overlapping. As Designers, use the skill of overlapping to make a strong papier mâché fruit bowl for Handa. As Designers, apply finishing techniques to their basket. As Designers, explain how they made their bridge and basket stronger.
Vocabulary	Join Build 3D Blocks Biggest Heaviest Bottom Strong Secure. Overlap Secure Move Glue Tape Staple Treasury tag Hole punch Split pin	Join Move Cut Draw Design Hole punch Split pin Finishing techniques Paint Margaret Knight America Paper bag Fold Glue	Design Build 3D Blocks Biggest Heaviest Bottom Strong Secure. Overlap Papier mâché Finishing techniques Paint

How does EYFS prepare for future learning in NC D&T Disciplines?

Design, Make, Evaluate	I can develop my own ideas about which materials to use and what to make. Gain some experience of designing, making and evaluating products for a specified user and purpose. I can share the purpose in mind before I create my product, with a friend or adult. I can confidently share my creation, explaining the process I have used to create it.

Cooking and Nutrition	I know why some foods are healthier, e.g. mentions nutrients, growth etc. I can handle a blunt knife with increasing control, with some support. I can use clockwise and anticlockwise movement and retrace vertical lines when spreading ingredients onto pancakes/bread. I can select tools and ingredients to assemble and join them together. I can use appropriate cutlery to eat my product. I can begin to evaluate my dish by stating one thing I like about it and one area of improvement.
Mechanisms	I can make vehicles. I can assemble vehicles with moving wheels using construction kits. I can explore moving vehicles through play. I can develop some cutting, joining and finishing skills with card.
Structures	I can confidently construct, stacking blocks vertically and horizontally. I can make a strong house using construction materials and/or cardboard and paper. I can confidently join construction pieces together to build and balance. I can use one handed tools and equipment. I realise tools can be used for a purpose, e.g. hammer is used to hit nails to join. I can give meaning to the different parts of my model. I can begin to explain simply how I constructed my model.
Textiles	I can talk about what materials I intend to use and why I intend to use them. I can begin to think about the user and purpose of my outfit. I can safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. I can confidently select tools and use techniques needed to shape, assemble and join textile materials to create an outfit.

Progression in KS1 and KS2



Below is an outline of progression for the designing, making and evaluating process of D&T; as well as progression in technical knowledge. Underneath this progression plan, is a more in-depth breakdown of knowledge and skills for each year group in KS1 and phase cycle in KS2 with an overview of each project.

Health and safety –Risk assessments are carried out prior to undertaking D&T activities. All health and safety policy and guidance are followed.

Design

KS1 Understanding contexts, users and purposes	Across KS1 pupils should: • use simple design criteria • state what their products are, who and what they are for and how they will work.
Generating, developing, modelling and communicating ideas	Across KS1 pupils should: • generate ideas using their own experiences and existing products • use talk, drawing, templates, mock-ups and, where appropriate, computers.
LKS2 Understanding contexts, users and purposes	Across LKS2 pupils should: • gather information about user needs • develop their own design criteria • describe the user, purpose and design features of their products and explain how they will work.
Generating, developing, modelling and communicating ideas	Across LKS2 pupils should: • generate realistic ideas based on user needs • use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.

UKS2 Understanding contexts, users and purposes	Across UKS2 pupils should: • carry out research • develop a simple design specification • describe the user, purpose and design features of their products and explain how they will work.

Generating, developing, modelling and communicating ideas	Across UKS2 pupils should: • generate innovative ideas drawing on research • use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design.

Make	
KS1 Planning	Across KS1 pupils should: • plan by suggesting what to do next • select from a range of tools, equipment, materials and components.
Practical skills and techniques	Across KS1 pupils should: • follow procedures for safety and hygiene • measure, mark out, cut, shape, assemble, join, combine and finish a range of materials and components.
LKS2 Planning	Across LKS2 pupils should: • order the main stages of making • select suitable tools, equipment, materials and components and explain their choices.
Practical skills and techniques	Across LKS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components • measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy.

UKS2 Planning	Across UKS2 pupils should: • formulate lists of resources and step-by-step plans • select suitable tools, equipment, materials and components and explain their choices.
Practical skills and techniques	Across UKS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components • measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.

Evaluate	
KS1 Own ideas and products	Across KS1 pupils should: • make simple judgements about their products and ideas against design criteria.
Existing products	Across KS1 pupils should: • explore who and what products are for, how they work and are used, what materials they are made from and what they like and dislike about them.
Key events and individuals	N/A
LKS2 Own ideas and products	Across LKS2 pupils should: • evaluate their ideas and products against their design criteria.

Existing products	Across LKS2 pupils should: • investigate how well products have been designed and made, whether they are fit for purpose and meet user needs • why materials have been chosen, the methods of construction used and how well they work.
Key events and individuals	Pupils should know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
UKS2 Own ideas and products	Across UKS2 pupils should: • identify strengths and areas to develop in their ideas and products against their design specification • consider the views of others to make improvements.
Existing products	Across UKS2 pupils should: • investigate how well products have been designed and made, whether they are fit for purpose and meet user needs • why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are.
Key events and individuals	Pupils should know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.

Technical knowledge	
KS1 Making products work	Across KS1 pupils should: • know about the simple working characteristics of materials and components, the movement of simple mechanisms, how freestanding structures can be made stronger, stiffer and more stable • use the correct technical vocabulary.

LKS2 Making products work	Across LKS2 pupils should: • know that materials have functional and aesthetic qualities • know that systems have an input, process and output • know how to program a computer to control their products • know how to make strong, stiff shell structures • use the correct technical vocabulary.
UKS2 Making products work	Across UKS2 pupils should: • know that materials have functional and aesthetic qualities • know that systems have an input, process and output • know how to program a computer to control and monitor their products • know how to reinforce and strengthen a framework • use the correct technical vocabulary.

Cooking and nutrition	
KS1 Where food comes from	Across KS1 pupils should: • know that food comes from plants or animals and that it is farmed or caught.
Food preparation,	Across KS1 pupils should: • know how to prepare simple dishes safely and hygienically without a heat source, • name and sort foods into groups • know that everyone should eat at least five portions of fruit and vegetables a day.

LKS2 Where food comes from	Across LKS2 pupils should: • know that food is grown, reared and caught in the UK, Europe and the wider world.
Food preparation, cooking and nutrition	Across LKS2 pupils should: • know how to prepare a variety of dishes safely and hygienically • know that a healthy diet is made from a variety and balance of different food and drink • know that food and drink are needed to provide energy for the body.

UKS2 Where food comes from	Across UKS2 pupils should: • know that food is grown, reared and caught in the UK, Europe and the wider world • know that seasons may affect the food available • know how food is processed into ingredients.
Food preparation, cooking and nutrition	Across UKS2 pupils should: • know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source • know that different food and drink contain nutrients, water and fibre that are needed for health.

Whole School D&T Long Term Overview

	Autumnn	Spring	Summer
Year 1	**Why should I use scissors correctly and safely?** Revisit previous learning and ensure all can use scissors correctly	**Food** Preparing Fruit and Vegetables **Why is a fruit salad a suitable snack for children?**	**Mechanisms** Sliders and Levers **How do sliders and levers make storytime fun?**
Year 2	**Textiles** Templates and Joining Techniques **How do you turn a fabric into a hand puppet toy?**	**Structures** **Why do we need bridges?**	**Mechanisms** Wheels and Axles **Kapow – How does a toy vehicle move?**

LKS2 Cycle A	**Textiles** 2-D Shape to 3D Product **Why is a small teddy bear a good toy for a child?**	**Food** Healthy and Varied Diet **How do you make a healthy sweet snack?**	**Mechanical Systems** Levers and Linkages **Kapow – How do pop-up books work?**
LKS2 Cycle B	**Structures** Shell Structures inc CAD **How do gift boxes work?**	**Food** Healthy and Varied Diet cont... **How do you make a healthy wrap?**	**Electrical Systems** Simple Circuits and Switches **Why do we need torches?**
UKS2 Cycle A	**Textiles** Combining Different Fabric Shapes **Why might we need a wallet?**	**Food** Celebrating Culture and Seasonality **How do you make a healthy energy snack?**	**Structures** Frame Structures **How do Kites work?**
UKS2 Cycle B	**Mechanical Systems** Gears or Pulleys **Kapow – How can I make a toy vehicle move?**	**Structures** Structures CAD designs TBC	**Electrical Systems** More Complex Switches and Circuits **What does a security alarm need?**

Design and Technology Progression KS1			
Year 1	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Why should I use scissors correctly and safely?**	**Food** Preparing Fruit and Vegetables **Why is a fruit salad a suitable snack for children?**	**Mechanisms** Sliders and Levers **How do sliders and levers make storytime fun?**
Building on prior learning (retrieval opportunities)	Reception: To use cutting skills safely.	Baking skills in EYFS To peel using tools. To cut, spread, mix and peel food.	Using scissors, crayons, pencils and paper in EYFS.
Key Learning	Continue to access activities where they can independently practice skills and display knowledge and understanding of design and technology principles. Adults will facilitate and model skills, as well as providing resources, materials and equipment the children require. Adults will continue to model how to use resources, materials and equipment accordingly through allocated curriculum time.	To know where fruits and vegetables are grown. To know which parts of fruits we eat. To handle, smell and taste fruit. To know basic food hygiene practices. To know how to use simple utensils and equipment: peel, chop, and slice. To know how to prepare a fruit salad.	To explore a range of existing products – Robert Sabuda. To know how to replicate slider and lever teaching aids. To make mock-ups of a slider and lever mechanism. To know how to generate, develop and communicate ideas based on simple design criteria. To plan and follow a method. To know how to evaluate their product.
Vocabulary	Recap Reception: Join Build 3D Blocks Biggest Heaviest Bottom Strong Secure. Overlap Secure Move Glue Tape Staple Treasury tag Hole punch Split pin	Taste, texture, bitter, sharp, tangy, sour, juicy, leafy, smooth, hygiene	Slider, lever, pivot, slot, join, fasten, design, user, product
Prepares for future learning in…	Year 1 Summer sliders and levers	Y2 – human diet LKS2 – preparing food hygienically UKS2 – use a heated appliance	LKS2 – levers and linkages – forces, how do mechanical systems work?
Year 2	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Textiles** Templates and Joining Techniques **How do you turn a fabric into a hand puppet toy?**	**Structures** **Why do we need bridges?**	**Mechanisms** Wheels and Axles **Kapow – How does a toy vehicle move?**

Building on prior learning (retrieval opportunities)	EYFS – threading beads and laces. Gained some experience of designing, making and evaluating products for a specified user and purpose.	EYFS – use of construction kits	EYFS – explored moving vehicles through play Gained some experience of designing making evaluating products for a specified user and purpose Developed some cutting, joining and finishing skills with card
Key Learning	To thread a metal needle and tie a knot. To complete a running stitch. To know how to finish off. To know what buttons are used for. To fasten a button on a piece of fabric. To attach two pieces of fabric using a simple running stitch.	To know the parts of a bridge – foundation, deck, towers, cables. To know and discuss how to make structures strong and stable. To evaluate existing famous bridges. To know how to use drawings to show ideas. To know how to make joints. To know how to make towers/ foundations. To know what will make a structure weaker or stronger. To know how to test the strength and evaluate their bridge.	To know and name the key features of a vehicle To know and use technical vocabulary To know and discuss what features help to make a vehicle move To know how to use different techniques to hold moving axles. To know the difference between fixed and freely moving axles. To know how to evaluate a range of products with wheels and axles
Vocabulary	Needle, thread, knot, seam, fabric	Freestanding, function, beam, weak, strong, stability, base, foundation, join, fix	vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism
Prepares for future learning in…	LKS2 – cutting fabric, seam allowance and a range of stitches UKS2 – create a bag with a fastening, more complex stitches	UKS2 – make a 3D construction frame	UKS2 - Mechanical Systems: Gears or Pulleys

Design and Technology Progression LKS2			
LKS2 Cycle A	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Textiles** 2-D Shape to 3D Product **Why is a small teddy bear a good toy for a child?**	**Food** Healthy and Varied Diet **How do you make a healthy sweet snack?**	**Mechanical Systems** Levers and Linkages **Kapow – How do pop-up books work?**
Building on prior learning (retrieval opportunities)	Y2 – toy puppet unit learnt running stitch, threading needles, tying knots.	Y1 - designing and making a healthy fruit salad PSHE and Science – healthy diets for wellbeing/growth	Year 1 **Mechanisms** Sliders and Levers unit with moving parts
Key Learning	To evaluate existing products. To know the intended user and purpose. To draw ideas and choose a design. To add labels to their chosen design. To produce and use a template. To understand seam allowance. To know how to join two pieces of felt with an overhand or simple stitch. To evaluate the product and discuss possible improvements.	To design and make a sweet dish, such as fairy cake or fruit tarts, for a target audience and for a particular purpose e.g., party, celebration. Pupils will begin by investigating a range of food products containing wheat and comparing seasonal food in other areas of the world. We will then investigate a range of sweet dishes and evaluate them against what is essential for a healthy and varied diet, using our knowledge of the *eatwell plate.* They will consider how ingredients can be swapped or altered slightly to cater for a healthy and balanced dish. Pupils will explore a variety of fairy cakes and fruit tarts and their texture and taste, recording their results on a table. Pupils will also explore the ingredients needed to make these sweet dishes and the recipe they follow. Pupils can choose a sweet dish to create from a variety of recipes for fairy cakes or fruit tarts.	To design and make a moving card/storybook, based on an imaginary storybook character and for a particular purpose. This topic will teach our children to bring stories to life. Children will begin by investigating, analysing and evaluating books and, where available, other products which have a range of lever and linkage mechanisms. Pupils will learn how to recreate some of these moving parts using a variety of tools and techniques before investigating different types of fonts and graphics. The children will design, create and evaluate their very own moving card/storybook with moving mechanisms.
Vocabulary	Pattern, template, needle, thread, knot, stiffen, seam, allowance		mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function, prototype, design criteria, innovative, appealing, design brief

Prepares for future learning in…	UKS2 – create a bag with a fastening, more complex stitches	LKS2 - Healthy wrap UKS2 - Celebrating culture and seasonality	Year 5 Mechanical Systems: Gears or Pull
LKS2 Cycle B	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Structures** Shell Structures **How do gift boxes work?**	**Food** Healthy and Varied Diet **How do you make a healthy wrap?**	**Electrical Systems** Simple Circuits and Switches **Why do we need torches?**
Building on prior learning (retrieval opportunities)	Year 1 **Mechanisms** Sliders and Levers unit with moving parts	Y1 - designing and making a healthy fruit salad PSHE and Science – healthy diets for wellbeing/growth	Spring 1 – LKS2 Science unit on Electricity
Key Learning	To design and make a moving card/storybook, based on an imaginary storybook character and for a particular purpose. This topic will teach our children to bring stories to life. Children will begin by investigating, analysing and evaluating books and, where available, other products which have a range of lever and linkage mechanisms. Pupils will learn how to recreate some of these moving parts using a variety of tools and techniques before investigating different types of fonts and graphics. The children will design, create and evaluate their very own moving card/storybook with moving mechanisms.	To design and make flatbreads/wraps for someone and for a particular purpose. Pupils will acquire the knowledge, skills and understanding about seasonal food in the UK and seasonal food around the world. Children will be able to differentiate between ingredients that are grown, reared, caught and processed and will combine these ingredients to make a meal with multiple processes and a variety of skills. When exploring food around the world, children will focus on creating flatbread/wraps and how the ingredients can be adapted according to and in line with the country they are made in (e.g. burrito, gyros, falafel tortilla wraps etc.) Pupils will create a design criteria and will adapt their design, ingredients and cooking method in line with the design criteria. Pupils will be expected to design, prepare and make a wrap containing meat/meat substitute filling, vegetables and relish/sauce. Pupils will evaluate their finished savoury meal against design criteria.	To evaluate existing products to find out how they work. To know how to use electrical systems in a product. To know how to correct simple faults. To apply the electrical circuit knowledge to control a product.
Vocabulary	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 control, program, system, input device, output device user, purpose, function, prototype, design criteria, innovative, appealing, design brief	texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet	Circuit, conductor, insulator, switch, component, battery, bulb, crocodile clip, wire, continuous

Prepares for future learning in…	UKS2 – Frame structures /CAD designs	LKS2 – Healthy sweet snack UKS2 - Celebrating culture and seasonality	UKS2 – Circuits and switches

Design and Technology Progression UKS2			
UKS2 Cycle A	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Textiles** Combining Different Fabric Shapes **Why might we need a wallet?**	**Food** Celebrating Culture and Seasonality **How do you make a healthy energy snack?**	**Structures** Frame Structures **How do Kites work?**
Building on prior learning (retrieval opportunities)	LKS2 – basic stitching techniques, threading a needle, fastening a row of stitches.	LKS2 – healthy wraps and snacks	LKS2 - structures
Key Learning	To evaluate existing products. To know intended user and purpose and create a simple design brief. To mark out measurements to make a template. To understand and use seam allowance. To know how to sew two pieces of fabric. To strengthen and reinforce fabric. To evaluate the product to discuss possible improvements.	To design and make biscuits for energy giving for someone and for a particular purpose. Pupils will acquire the knowledge, skills and understanding about fairtrade produce . Children will be able to differentiate between healthy and energy giving ingredients and combine these ingredients to make biscuits with multiple processes and a variety of skills. Pupils will create a design criteria and will adapt their design, ingredients and cooking method in line with the design criteria.	Pupils will begin by investigating and making annotated drawings of a range of portable and permanent frame structures, considering the six D&T Essentials in their plans and evaluation. Children will research key events and individuals related to their study of frame structures such as Stephen Sauvestre – a designer of the Eiffel Tower and Thomas Farnolls Pritchard – designer of the Iron Bridge. Year 5 will carefully consider how effectively these key individuals created their frame structure to apply to their own learning To investigate a range of portable and permanent frame structures. To understand the use of triangulation in structures. To practise cutting wood using a bench hook. To join two pieces of wood at a right angle, using triangle cards. To discuss, design and made a small-scale frame structure. To know how to produce a step-by-step plan listing tools and materials. To annotate sketches to develop and communicate ideas. To develop skills and techniques using junior hacksaws. To use finishing materials to create the style of ..... To know how to strengthen, stiffen and reinforce 3D frameworks.

Vocabulary	Function, pattern, template, reinforce, seam		frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional
UKS2 Cycle B	**Term 1**	**Term 2**	**Term 3**
Enquiry Question	**Mechanical Systems** Gears or Pulleys **Kapow – How can I make a vehicle move?**	**Structures** Structures CAD designs	**Electrical Systems** More Complex Switches and Circuits **What does a security alarm need?**
Building on prior learning in… (retrieval opportunities)	Yr2	Yr 4 Structures	Science
Key Learning	To design and make a controllable toy vehicle with gears or pulleys, for example a dragster, off-road vehicle, sports car, lorry etc. Pupils will begin by investigating, analysing and evaluating existing everyday products and existing or pre-made toys that incorporate gear or pulley systems. Year 5 will design, make and evaluate their toy vehicle with gears or pulleys against design criteria. Pupils will be encouraged to evaluate throughout and the final product in use, comparing it to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose.	tbc	To design and make a security alarm for a valuable artefact for someone and for a particular purpose. Pupils will use research to discuss a range of relevant products that respond to changes in the environment using a computer control program such as alarm systems. Pupils will investigate electrical sensors such as light dependent resistors (LDRs) and a range of switches to gain an understanding of how they are operated and how they work. Pupils will research famous inventors related to the project such as Thomas Edison –light bulb. Pupils will draw on science understanding to explore a range of electrical systems that could be used to control their alarm system. They will also draw on related computing activities to write computer control programs. Children are expected to create a structure to attach their system to and will evaluate their product based on design criteria.
Vocabulary			series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart function, innovative, design specification, design brief, user, purpose