

Design and Technology skills progression document

EYFS Artistic skills	Key Stage 1 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations
<p>In DT Pupils need to understand:</p>	<p>Pupils should be taught about:</p> <p>Design: Design purposeful, functional, appealing products for themselves and other users based on design criteria. Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups, and, where appropriate, information and communication technology.</p> <p>Make: Select from and use a range of tools and equipment to perform practical tasks (e.g., cutting, shaping, joining, and finishing). Select from and use a wide range of materials and components, including construction materials, textiles, and ingredients, according to their characteristics.</p> <p>Evaluate: Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria.</p> <p>Technical Knowledge: Build structures, exploring how they can be made stronger, stiffer, and more stable. Explore and use mechanisms (e.g., levers, sliders, wheels, and axles) in their products.</p> <p>Cooking and Nutrition: Use the basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from.</p>	<p>Pupils should be taught about:</p> <p>Design: Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.</p> <p>Make: Select from and use a wider range of tools and equipment to perform practical tasks (e.g., cutting, shaping, joining, and finishing) accurately. Select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities.</p> <p>Evaluate: Investigate and analyse a range of existing products. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. Understand how key events and individuals in design and technology have helped shape the world.</p> <p>Technical Knowledge: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures. Understand and use mechanical systems in their products (e.g., gears, pulleys, cams, levers, and linkages). Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors). Apply their understanding of computing to program, monitor, and control their products.</p> <p>Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Understand seasonality and know where and how a variety of ingredients are grown, reared, caught, and processed.</p>

<u>Year</u>	<u>Unit title</u>	<u>Skills</u>	<u>Objectives / knowledge</u>	<u>Questions that children will answer</u>	<u>Vocabulary</u>	
					<u>Tier 2</u>	<u>Tier 3</u>
Nursery	AUTUMN 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Explore and describe different textures of clothing materials (e.g. soft, rough, waterproof). ● Sort clothing items based on their purpose (e.g. summer vs autumn clothes). ● Attempt to fasten and unfasten buttons, zips, or Velcro to develop fine motor skills. ● Design a simple autumn outfit using collage materials (e.g. cutting and sticking materials to a paper figure). ● Experiment with materials to see which are best for keeping warm or dry (e.g. testing water on fabric). ● Attempt to put on their own coat using the “coat flip” method or fastening buttons. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● To recognise that clothes are designed for different seasons and weather conditions. ● To understand that clothes have different materials and features for warmth and protection. ● Begin to explore how clothes are made and how fastenings (buttons, zips, Velcro) work. ● To talk about how they put on and take off clothes, developing independence in dressing. ● To recognise that designers, make clothes for different purposes (e.g. waterproof coats for rain). 	<ul style="list-style-type: none"> ● How do we make sure our clothes keep us warm in autumn? ● What materials do you think are best for a warm jumper? Why? ● How does a zip work? Can you try to zip up your coat? ● Which clothes do you think would help keep you dry on a rainy day? ● Can you feel these fabrics—how are they different? Which one feels warmer? ● Why do some jackets have buttons and others have zips? ● If you were going outside today, what would you wear and why? 	<ul style="list-style-type: none"> ● Materials: wool, fleece, cotton, waterproof, soft, thick, thin ● Clothing Items: jumper, coat, jacket, boots, scarf, gloves ● Features: zip, button, Velcro, hood, sleeves ● Actions: fasten, unfasten, zip up, pull, tie, put on, take off ● Design Terms: warm, dry, cosy, waterproof, comfortable 	
	AUTUMN 2	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Understand that they can combine materials to make a product (a Christmas card). ● Learn how to join materials together using glue. ● Explore different textures and how they can be layered for a design. ● Develop early cutting, tearing, and sticking skills. ● Begin to make choices about materials and understand that design is a process. ● Recognise that people design and make products for different purposes (e.g. cards for celebration). 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Select different types of paper (e.g. tissue paper, foil, card) and experiment with textures. ● Tear, scrunch, or cut paper into different shapes and sizes for collage. ● Use glue effectively to stick materials down. ● Arrange and layer materials to create a simple collage effect. ● Talk about their design choices (e.g. "I used red paper because it looks like Santa's suit"). ● Use both hands to manipulate paper and develop fine motor coordination. ● Begin to explore how different materials react when stuck together 	<ul style="list-style-type: none"> ● What materials do you think will look nice on your Christmas card? Why? ● How does this paper feel? Is it soft, rough, or crinkly? ● What happens when you tear the tissue paper? What if you fold it? ● Why do we need to use glue? What happens if we don't use enough? ● Can you layer these papers on top of each other? What do you notice? ● What colours do we see at Christmas? How can we use them in our card? ● Who is your Christmas card for? What do you think they will like about it? 	<ul style="list-style-type: none"> ● Materials: paper, card, glue, tissue paper, foil, cotton wool, glitter ● Actions: cut, tear, stick, press, layer, smooth, scrunch, fold, arrange ● Properties & Effects: soft, rough, shiny, bumpy, smooth, crinkly, thick, thin ● Design Terms: Christmas, card, decorate, collage, pattern, edges, shapes 	

			(e.g. tissue paper might wrinkle, foil might be smooth).		
SPRING 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Understand that vehicles have different parts that help them move and work. • Recognise that things can break and need to be fixed. • Explore simple ways to repair or maintain toy vehicles (e.g. tightening wheels, wiping dirt off). • Develop problem-solving skills by investigating how parts fit together. • Begin to understand that tools help us fix and maintain objects. • Learn that vehicles need care (e.g. keeping them clean, making sure the wheels work). 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Identify different parts of a bike or toy vehicle (e.g. wheels, axles, steering). • Use simple tools (toy screwdrivers, cloths, brushes) to pretend to fix or clean vehicles. • Explore how wheels turn and how they can be attached securely. • Investigate how vehicles move and what happens when parts are missing or broken. • Talk about their fixing process (e.g. "The wheel was loose, so I made it tight"). • Work collaboratively to maintain and take care of bikes and toy vehicles. 	<ul style="list-style-type: none"> • What happens if a bike or car has no wheels? Can it move? • Why do we need to take care of our bikes and toy vehicles? • Can you show me how the wheels move? What happens if they are stuck? • What tool do you think we need to fix this? How does it help? • Why do cars and bikes sometimes need cleaning? What should we use? 	<ul style="list-style-type: none"> • Parts of a vehicle: wheels, axles, steering, handlebar, pedals, brakes, seat • Actions: fix, tighten, loosen, turn, roll, spin, clean, wipe, repair • Tools & Materials: screwdriver, wrench, cloth, brush, oil, air pump 	
SPRING 2	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Understand that musical instruments can be made from different materials. • Explore how different materials create different sounds. • Learn how to join and assemble materials to make a simple instrument. • Recognise that sounds can express feelings (e.g. loud sounds for excitement, soft sounds for calmness). • Begin to experiment with playing instruments in different ways (shaking, tapping, banging, scraping). • Develop early design thinking by making choices about materials and decoration. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Select and use materials to create a simple instrument (e.g. a shaker, drum, or tambourine). • Experiment with different ways to make sound (e.g. shaking rice inside a bottle, tapping a box). • Use glue, tape, or string to join materials together securely. • Decorate their instruments using colours and patterns of their choice. • Play their instrument in different ways and notice the changes in sound. • Express how different sounds make them feel (e.g. "The drum is loud! It makes me want to dance!"). • Work collaboratively to create music together. 	<ul style="list-style-type: none"> • What happens when you shake your instrument? How does it sound? • What can we put inside our shaker to make a different sound? • How does this sound make you feel? Does it make you want to move? • What happens if we tap softly? What about if we tap harder? • Can you make a fast rhythm? How about a slow one? • Why do you think different materials make different sounds? • How can we decorate our instrument to make it special? 	<ul style="list-style-type: none"> • Instrument Types: shaker, drum, tambourine, guitar, maraca • Materials: box, bottle, rice, pasta, string, rubber bands, tape, glue, paper, foil • Actions: shake, tap, bang, scrape, rub, stretch, pluck, press • Sounds & Feelings: loud, quiet, soft, high, low, fast, slow, happy, excited, calm 	

	SUMMER 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that worms live underground and help the soil. Learn that a wormery is a special home for worms where they can move through layers of soil and food. Recognise the importance of looking after living things. Explore how different materials (soil, sand, leaves) can be layered to create a habitat. Develop problem-solving skills by designing and building a simple wormery. Observe changes over time, such as worms moving and mixing the soil. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Choose a suitable container for the wormery (e.g. a clear plastic bottle or jar). Layer materials (soil, sand, leaves) to create a space for worms to live. Carefully place worms into their new habitat. Observe the worms and describe how they move and what they do. Discuss what worms need to stay healthy (moisture, air, food). Work collaboratively to create and care for the wormery. 	<ul style="list-style-type: none"> Choose a suitable container for the wormery (e.g. a clear plastic bottle or jar). Layer materials (soil, sand, leaves) to create a space for worms to live. Carefully place worms into their new habitat. Observe the worms and describe how they move and what they do. Discuss what worms need to stay healthy (moisture, air, food). Work collaboratively to create and care for the wormery. 	<ul style="list-style-type: none"> Choose a suitable container for the wormery (e.g. a clear plastic bottle or jar). Layer materials (soil, sand, leaves) to create a space for worms to live. Carefully place worms into their new habitat. Observe the worms and describe how they move and what they do. Discuss what worms need to stay healthy (moisture, air, food). Work collaboratively to create and care for the wormery.
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Reception	AUTUMN 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that playdough is a product made by combining different materials. Learn that materials change when mixed, kneaded, or heated. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Follow a simple recipe and instructions to make playdough. Measure and pour dry and wet ingredients with support. 	<ul style="list-style-type: none"> What do you think will happen when we mix the flour and water? How does the dough feel? Is it different from the flour before we mixed it? Why do we need to knead the dough? 	<ul style="list-style-type: none"> Tools & Actions: knife, cut, slice, chop, spread, hold, grip, press, handle Food Types: fruit, vegetables, bread, cheese,

		<ul style="list-style-type: none"> Recognise that measuring and following instructions are important in making products. Explore how different textures and consistencies can be created by adjusting ingredients. Begin to understand that playdough can be designed and used for a purpose (e.g. modelling, printing, shaping). Develop confidence in using simple tools and techniques to manipulate materials. 	<ul style="list-style-type: none"> Mix and knead ingredients until the correct consistency is reached. Explore how adding more flour or water changes the dough. Use tools (rollers, cutters, moulds) to shape and design with playdough. Describe the process and changes in materials during mixing and kneading. Work collaboratively, taking turns and sharing equipment. 	<p>What happens if we don't?</p> <ul style="list-style-type: none"> What could we add to make our playdough a different colour or smell? How can we change the texture of our playdough? What happens if we add more flour or more water? Can you use a tool to make a shape? What shape have you made? If you wanted to make a smoother playdough, what would you do differently next time? 	<ul style="list-style-type: none"> butter, banana, cucumber Safety & Hygiene: careful, safe, clean, wash, fingers, sharp, blade, handle, germs
AUTUMN 2	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Recognise and name a variety of everyday materials (wood, plastic, glass, metal, water, and paper). Understand that different materials have different properties (e.g. hard, soft, rough, smooth, shiny). Begin to explore how materials are used for different purposes based on their properties. Develop an awareness of recycling and why it is important for the environment. Learn that some materials can be reused or repurposed instead of being thrown away. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Identify and name different materials in their environment. Describe the properties of materials using simple words (e.g. "This metal is shiny and hard"). Sort and classify materials based on their properties (e.g. rough vs. smooth, soft vs. hard). Explore how materials are used in everyday objects and explain why (e.g. glass for windows because it is transparent). Recognise recyclable materials and begin to sort waste into recycling and non-recycling. Engage in simple activities to reuse materials creatively (e.g. junk modelling) 	<ul style="list-style-type: none"> Can you find something made of wood/plastic/glass/metal/paper? What does it feel like? Why do you think windows are made from glass instead of wood? What happens if we put paper in water? What about plastic? Can you sort these objects into hard and soft materials? What do we do with plastic bottles and cardboard boxes after we use them? Why do we recycle? What happens if we don't? Can you think of a way to use old paper or boxes to make something new? 	<ul style="list-style-type: none"> Materials: wood, plastic, glass, metal, paper, water Properties: hard, soft, rough, smooth, shiny, dull, strong, weak, bendy, stiff Recycling Terms: recycle, reuse, waste, environment, sort, bin, landfill 	
SPRING 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that animals need habitats that provide food, water, and shelter. Recognise that different materials can be used to construct habitats for animals. Learn that habitats can be built in different ways (e.g. birds use twigs for nests, beavers use wood for dams). Explore how different materials can be joined and used effectively to create structures. Develop problem-solving skills by designing and 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Identify and describe different animal habitats and their features. Select suitable materials to create a model of an animal habitat. Cut, stick, and join materials to build a small-scale habitat. Explore how materials can be manipulated (e.g. folding paper for a cave, scrunching tissue for leaves). Experiment with textures and 	<ul style="list-style-type: none"> What materials could we use to make a warm home for a polar bear? How can we make our habitat strong so that it doesn't fall apart? What does this animal need to survive in its home? How can we include that in our design? Which materials would be best for a bird's nest? Why? What happens if we use the wrong materials? Would a fish be able to live in a 	<ul style="list-style-type: none"> Types of Habitats: jungle, desert, ocean, woodland, polar, nest, burrow, cave, pond Materials & Tools: sticks, leaves, cardboard, glue, tape, fabric, paper, paint, scissors Building Terms: cut, join, stick, fold, shape, build, attach, model, construct 	

		<ul style="list-style-type: none"> constructing a model habitat. Understand that designing and making structures requires planning, choosing materials, and assembling them. 	<ul style="list-style-type: none"> materials to make habitats look realistic (e.g. using cotton wool for snow, sand for deserts). Work collaboratively to design and build a habitat that meets the needs of a chosen animal. Evaluate their model by discussing how it helps the animal survive (e.g. "The fox can hide inside the den to stay warm"). 	<ul style="list-style-type: none"> paper pond? How can we make our habitat look more realistic? What can we add? If you could design a new home for an animal, what would it look like? 	<ul style="list-style-type: none"> Animal Needs: shelter, home, food, water, safe, warm, cool, protect
	SPRING 2	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that pancakes are made by combining and cooking different ingredients. Learn about the tradition of Shrove Tuesday and why people make pancakes. Recognise that different ingredients have different roles in cooking (e.g. flour makes the batter thick, eggs help it stick together). Develop an awareness of food preparation and hygiene. Explore how heat changes ingredients (e.g. liquid batter turns into a solid pancake). Learn that food can be prepared and cooked in different ways. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Identify and name the ingredients used to make pancakes. Follow simple step-by-step instructions for mixing pancake batter. Measure and pour ingredients with support. Stir and whisk ingredients to make a smooth batter. Observe how the batter changes when cooked. Choose toppings and assemble their own pancake. Discuss how food changes when mixed and cooked. 	<ul style="list-style-type: none"> What do we need to make pancakes? What happens when we mix all the ingredients together? How do we know when a pancake is ready to eat? Why do we need to wash our hands before cooking? What happens to the pancake batter when we cook it? What toppings would you like on your pancake? Why? Why do people eat pancakes on Shrove Tuesday? 	<ul style="list-style-type: none"> Ingredients: flour, egg, milk, butter, sugar, lemon, syrup Cooking Actions: mix, stir, pour, whisk, cook, flip, spread, roll, eat Food Properties: smooth, runny, thick, soft, warm, hot Food Hygiene: clean, wash, safe, hands, germs
	SUMMER 1	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that everyday objects (e.g. a sweet potato) can be used creatively to design characters. Learn that a superhero has key features (e.g. a cape, mask, emblem) that make them recognisable. Explore different materials and joining techniques to create a superhero figure and accessories. Develop problem-solving skills by selecting materials that work best for their design. Recognise that designing involves planning, making, and evaluating. Experiment with shape, texture, and colour in 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Choose a sweet potato as the body of their superhero. Select and attach materials to create facial features, a mask, and other superhero elements. Use simple tools and materials (e.g. glue, tape, fabric, card) to construct a cape. Experiment with cutting, folding, and sticking to create details. Talk about their superhero's powers and why they chose certain designs. Work collaboratively by sharing materials and ideas. 	<ul style="list-style-type: none"> What will your superhero look like? What colours will you use? What superpowers does your superhero have? How will you show them in your design? What can we use to attach the cape to the sweet potato? How can we make sure the mask stays on? What materials would be best? What happens if we use different fabrics for the cape? Which one moves the best? How can we make sure our superhero stands up or stays balanced? If you could improve your design, what would you change? 	<ul style="list-style-type: none"> Materials: sweet potato, fabric, paper, felt, glue, tape, card, string Actions: cut, stick, glue, attach, fold, decorate, design, create Superhero Features: mask, cape, emblem, shield, powers, strong, fast, brave Textures & Properties: soft, smooth, rough, bendy, stiff, shiny

		their superhero design.	<ul style="list-style-type: none"> Evaluate their finished superhero, discussing what they like and what they could improve. 			
	SUMMER 2	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Understand that recycled materials can be used creatively to make new products. Learn that different materials can be shaped, joined, and decorated to create a 3D model. Explore different techniques for attaching and layering materials to add detail and strength. Develop fine motor skills through cutting, gluing, and assembling materials. Recognise that patterns and textures can be made by printing and layering paint. Begin to evaluate their designs, thinking about how they could improve or change them. 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Select and use recycled materials (e.g. plastic bottles, tissue paper, cardboard) to design and make a model fish. Cut, stick, and shape materials to create different features (e.g. fins, tails, scales). Use glue, tape, and other joining methods to attach materials securely. Explore painting and printing techniques to create scale patterns and textures. Use different objects and tools (e.g. sponges, bubble wrap, fish shapes) to print onto paper or fabric. Work collaboratively, sharing tools and ideas to develop their designs. Talk about their fish models and printed artwork, describing how they made them. 	<ul style="list-style-type: none"> How can we turn this plastic bottle into a fish? What will we need to add? What colours and textures will make your fish look more realistic? How can we make the fins and tail strong so they don't fall off? What happens when you press the painted fish shape onto paper? Which materials would work best for making scales? Why? What can we do to make our fish models more interesting? If you could make another fish, how would you improve your design? 	<ul style="list-style-type: none"> Materials: plastic bottle, tissue paper, paint, sponge, glue, tape, cardboard, bubble wrap Actions: cut, stick, glue, attach, fold, press, print, design, create, decorate Fish Features: fins, tail, scales, gills, eyes, mouth Textures & Properties: smooth, rough, shiny, bumpy, patterned, layered, transparent 	
1	<p>AUTUMN 1 Block A Mechanisms – Block A</p> <p>How can you make a picture move?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Design and make a slider product Use Different methods to create card sliders Evaluate the success of their outcomes and recommend improvements 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring sliders and their applications Developing practical skills Evaluating Outcomes 	<ul style="list-style-type: none"> What is a slider? How does a template help you to cut shapes accurately? How does a slider move? What is weaving? What does linear mean? Why do the strips of paper need to be the same width? What is the difference between a push and a pull? How could you improve your paper weave? 	<p>Slider Slot Bridge</p>	<p>Push Pull rigid</p>

		 <p><i>Little Red Riding Hood</i> Deans of London (1855)</p>				
<p>AUTUMN 2 Block B – Structures</p> <p>How can you stop a tower from toppling over?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● structure that stands on its own foundation or base without attachment to anything else ● Build structures that are freestanding using a range of different materials  <p><i>The Leaning Tower of Pisa</i> (started in 1173 and completed in 1372)</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Identification of the problem ● Explicit teaching of skills relating to the brief ● Evaluation and adaptation 	<ul style="list-style-type: none"> ● What does balance mean? ● How can you increase the height of your tower without it toppling over? What is a foundation? ● What is the tallest tower you can make with the fewest number of blocks? ● Which shapes are best for building with 	<p>Tower Topple Lean</p>	<p>Foundation Balance Perpendicular</p>	
<p>SPRING 1 Block C- Food and Nutrition</p> <p>How does food affect your senses?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Why colourful food can be healthier ● How different foods can affect their senses ● How to peel, chop and grate a selection of vegetables ● How to modify food to suit their food senses 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Exploring sensory qualities of food ● Explicit teaching of culinary skills and techniques ● Applying skills and evaluating outcomes 	<ul style="list-style-type: none"> ● Why is it important to eat fruit and vegetables daily? ● Which vegetable was easiest to prepare and why? ● If you ate only one type of vegetable, would you get all the nutrients your body needs? ● How might the taste, smell, appearance and texture of the vegetables change when they are cooked? ● Name some types of food that have a savoury, sour or bitter flavour. Which spice 	<p>Senses Vitamins Sensory</p>	<p>Ribboning Caramelise Marinade</p>	

	 <p><i>Rainbow wraps</i> <i>Crudités</i> <i>Vegetable kebabs</i></p>		<ul style="list-style-type: none"> has a sweet, smokey, strong, subtle smell? What could you do if your dressing has little flavour? How has cooking changed the vegetables? Why is eating different coloured vegetables good for you? Do all types of food brown when cooked? How could you make your dip more sour? What changes would you make next time you make kebabs? 		
<p>SPRING 2 Block D Understanding Materials</p> <p>Can you build with bread?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Build materials that have different properties which enable them to be used for different purposes Identify, sort and select materials that can be used in construction Combine materials <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Frank Lloyd Wright (1867 – 1959)</p> </div> <div style="text-align: center;">  <p>Fallingwater (1935) Frank Lloyd Wright</p> </div> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring materials Explicit teaching of skills relating to the brief Application of skills 	<ul style="list-style-type: none"> What are the properties of the material? Is the material soft, hard, dull, shiny, transparent, flexible? How have the properties of the bread changed? Can you explain why this has happened? What is the school made of? Why are some materials more suitable for building with than others? How would the consistency of your cement change if you added syrup? What would happen if cement was not used? What changes did you make to your design and why? How does the cement change when water is added? What happens when the cement is left to dry? What difficulties did you face and how did you overcome them? Which is a more suitable building material? Fresh or toasted bread? What has made it possible to build with bread? 	Construction Properties Architect	Modify Cement Solidify
<p>SUMMER 1 Block E Textiles</p> <p>How can two squares of fabric keep you warm?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Join fabric together using a running stitch Create a running stitch Select tool for darning Thread a needle 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Identification of the problem Explicit teaching of skills relating to the brief Application of skills 	<ul style="list-style-type: none"> How is a darning needle different to a standard needle? Why is it important to sew two lines of running stitch to attach the front and back of the pouch? What is yarn? Will the pouch still be warm after an hour? 	Binca Sewing Felt	Running stitch Attach Pouch

		 <p><i>The Bayeux Tapestry (1077)</i></p>		<ul style="list-style-type: none"> • How is string different to embroidery silk? • What is better, small or large stitches? Why? • Which type of thread is easier to sew with? Why? • How do you stop the stitches coming loose once you have finished sewing? 		
	<p>SUMMER 2 Block F</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Explain the importance of including a range of vegetables in a diet • Peel, grate, season and breadcrumb a range of vegetables  <p><i>Vegetable dips Pitta pockets Breaded vegetables</i></p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring tastes and textures of a range of vegetables • Exploring the nutritional value of food • Applying culinary skills and techniques 	<ul style="list-style-type: none"> • What is a root vegetable? • Why should we eat a variety of vegetables each day? • What is the difference between slicing and dicing? • How does coating vegetables in breadcrumbs change their flavour and texture? • What can you use to change or add to the flavour of food? • Why do courgettes take less time to cook than butternut squash? • Why are raw vegetables so good for us? • How could you improve the flavour or texture of the food you have made? 	Function Variety texture	Vitamins Nutritious Pane
2	<p>AUTUMN 1 Block A Textiles</p> <p>How can you repurpose an item of clothing?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Cut out shapes which have been created by using a template • Use a range of basic sewing skills • Use a template to transfer a pattern • Cut out and join fabric shapes using a template 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring materials and techniques • Explicit teaching of skills • Application of skills 	<ul style="list-style-type: none"> • What happens if you don't cut the paper shapes accurately? • What is a patchwork? • How is it different to other types of fabric? What is a template? • Which geometric shapes are the best to use for a patchwork and why? • Why is it important to use a template to cut out shapes? • What is the difference between patchwork and appliqué? • How is an overstitch different to a running stitch? • What does repurpose mean? • Why would you use an overstitch instead of a running stitch? 	Patchwork Overstitch Repurpose	Template Appliqué quilt

		 <p>Patchwork (unknown) Frank Havrah 'Kaffe' Fassett (born 1937)</p>		<ul style="list-style-type: none"> • What improvements would you make to your work and why? • What is a geometric shape? Why is an overstitch used to join the fabric shapes instead of a running stitch? • Why is it important to attach the fabric to the paper template using larger stitches? • What could your patchwork be used for? Could it be made into a functional item? • Why is a template needed? 		
<p>AUTUMN 2 Block B</p> <p>What does healthy mean?</p>		<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Talk about why vegetables are so important to our health • Talk about what processed foods are • Prepare a range of salad vegetables • Shape and season a bread snack  <p>Jam jar salad Tortilla quiche Pitta crisps</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring nutrition • Explicit teaching of culinary skills and techniques • Evaluating outcomes 	<ul style="list-style-type: none"> • What are vitamins? • Are salt and sugar bad for us? • Why are vegetables good for us? • What are the claw and bridge techniques? • What makes processed food less healthy than fresh? • Why is lemon juice added to the dressing? • How many vegetables can you name? • What changes would you make to your salad and why? • Which foods contain protein? • What does coagulate mean? • Why does the body need protein? How does the consistency of the egg change when heat is added? • What does free-range mean? • What different vegetables could you use as your quiche filling? • What is the difference between an egg that comes from a free-range hen and one that does not? • What does wholemeal mean? • What changes would you make to the flavours you have used? • What is the difference between white flour and wholemeal flour? • How is your pitta snack healthier than a packet of crisps? • What is fibre and why does the body need it? 	<p>Free-range Processed Coagulate</p>	<p>Vitamins Protein Wholemeal</p>

<p>SPRING 1 Block C</p> <p>Are bigger wheels always better?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Work wheels and axles together • Create a simple wheel mechanism • Use wheel mechanisms to propel a simple vehicle <div style="display: flex; justify-content: space-around;">   </div> <p>Karl Friedrich Benz (1844 – 1929) Inventor of the automobile wheel</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Understanding how wheels and axles works • Exploring the size of wheels and positioning of axles • Building and testing a simple vehicle 	<ul style="list-style-type: none"> • Which objects use a fixed axle? • How many wheels does a vehicle need? Why? • How are most fixed axle vehicles powered? Will a vehicle with more wheels move faster? • What does rotate mean? • Why is the hole in the wheel in the centre? What is an axle? • Does your vehicle roll smoothly? Why / why not? • What improvement would you make to your vehicle? Why? • How have you made sure the vehicle clears the ground? • Has the position of the axles made your vehicle more or less stable? What can you do to make sure the vehicle is robust? • What difficulties did you have during construction? • How did you overcome these problems? 	<p>Wheel Axle Axle holder Chassis</p>	<p>Rotate Position Centre</p>
<p>SPRING 2 Block D Understanding Materials</p> <p>How can you waterproof a hat?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Modify materials for it to become waterproof • Articulate that origami comes from the Japanese words: ori – folding and kami – paper • Make paper waterproof • Transform flat paper by folding and creasing to form a hat <div style="display: flex; justify-content: space-around;">   </div> <p>Arthur Wellesley – First Duke of Wellington (1769 – 1852)</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploration and testing of materials • Exploration of materials and properties • Application of knowledge and skills to fulfil a brief • Evaluation 	<ul style="list-style-type: none"> • What features do clothes designed for wet weather have? • Are all feathers waterproof? • Are all clothes with hoods suitable for wet weather? What is the difference between waterproof paper and non-waterproof paper? • Is it just the material they are made from that makes Wellington boots so well suited to wet weather? • Does folding paper always make it more rigid? How do you know which materials are waterproof? • What is the difference between a fold and a crease? • Why must a duck's feathers be waterproof? • What will happen if areas of the paper hat are left exposed? 	<p>Manipulate Flexible Barrier</p>	<p>Waterproof Resist Absorbent</p>
<p>SUMMER 1 Block E</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Recognise the difference between fresh food and 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Explicit teaching and revisiting of 	<ul style="list-style-type: none"> • What are vitamins? • What does caramelisation mean? Why are 	<p>Ingredients Fibre</p>	<p>Processed Vitamins</p>

<p>Food and Nutrition</p> <p>How healthy is your food?</p>	<p>ultra-processed foods</p> <ul style="list-style-type: none"> ● Shape and form ingredients to make delicious food ● Use a range of culinary techniques <div style="display: flex; justify-content: space-around;">    </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <p>Overnight oats</p> <p>Potato rosti</p> <p>Quesadilla</p> </div>	<p>culinary skills and techniques</p> <ul style="list-style-type: none"> ● Exploring the nutritional value of food ● Applying culinary skills and techniques ● Evaluating outcomes 	<p>seeds good for you?</p> <ul style="list-style-type: none"> ● How has baking in the oven changed the taste and texture of the seeds? ● Crisps and milk are both processed. Does this mean they are equally unhealthy? ● How could you change the taste and texture of your oat breakfast meal? ● True or false? Potatoes are vegetables and vegetables are healthy so that means crisps are healthy. ● How will the appearance and texture of the potato change after cooking? ● Why does the grated potato stick together? ● What does the rosti taste like? How would you improve the flavour? ● What would happen if you did not squeeze the moisture out? ● What is fibre? ● What does dicing mean? ● Which types of food contain fibre? ● How can you change the flavour of your filling? ● Why is protein and calcium good for us? ● What happens when cheese is heated? ● What changes would you make to your wrap? 	<p>Protein</p>	<p>Starch</p>
<p>SUMMER 2</p> <p>Block F</p> <p>Structures</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Fold paper to increase strength and stability ● Test and record how much weight paper can hold <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <p>Dame Zaha Mohammad Hadid (1950 – 2016)</p> <p>The Riverside Museum, Glasgow (2011)</p> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Explicit teaching of skills ● Exploring materials ● Application of skills ● Evaluation and adaptation 	<ul style="list-style-type: none"> ● If you doubled the thickness of the paper, would that double the amount of weight your paper pillar could hold? ● What happens if you position the folded cards to create different shapes? ● Does this affect the stability of the tower? ● Which shape of pillar is strongest? How do you know? ● What will you use in your design and why? ● If a piece of paper has lots of folds, does that always mean that it is stronger? ● What changes can you make to your design to improve the stability of the structure? ● Is a corrugated sheet of paper stronger if it is positioned vertically or horizontally? ● How would you approach this challenge differently next time? 	<p>Paper (noun) Crease (noun) Corrugated</p>	<p>Pillar Storey Load (noun)</p>

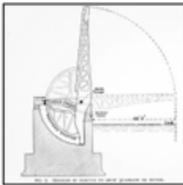
3	<p>AUTUMN 1 Block A Textiles</p> <p>How can you make a box out of cloth?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Select and apply solutions to stiffen fabric ● Make a box using stiffened fabric  <p>Gisela Stromeyer.</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Identification of the problem ● Explicit teaching of skills relating to the brief ● Application of skills 	<ul style="list-style-type: none"> ● What does rigidity mean? ● Does the thickness of the fabric used affect how much fabric is needed to cover the box? ● How does the texture and rigidity of each treated sample differ from the control sample? ● Why is it important to cover the outside of the box first? ● Does the amount of solution you apply affect the results? ● How could your fabric box be made stronger and more rigid? ● Which is the most effective solution / substance at giving rigidity to fabric? ● What happens if you do not fold your fabric paper firmly? ● Why is a 1cm allowance needed when cutting the fabric for the box? ● What improvements could you make to your fabric boxes? 	Starch PVA Glue Gelatine	Stiffen Interfacing cloth
	<p>AUTUMN 2 Block B Food and Nutrition</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> ● Make a fruit and yoghurt dessert ● Make homemade chips ● Flavour foods to increase their sensory qualities  <p><i>Fruity yoghurt</i> <i>DIY popcorn</i> <i>Homemade chips</i></p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> ● Exploring nutrition ● Exploring the healing qualities of food ● Explicit teaching of culinary skills and techniques ● Applying knowledge ● Evaluating outcomes 	<ul style="list-style-type: none"> ● What does preserve mean? ● Which method preserves fruit for the longest period refrigeration or dehydration? ● What does seasonal mean? Is sugar always bad? ● How could you adapt this recipe? ● What is a kernel? ● How does homemade popcorn compare to popcorn bought in the shops? ● What makes the kernel burst? ● How could you change the flavour of your popcorn? ● Is popcorn an unhealthy treat? ● Which flavours were your favourite and why? ● What is starch? ● Why are carbohydrates important? ● What difference would it make if you did not coat the chips in semolina? ● Why are pre-made chips less healthy than homemade chips? 	Seasonal Balance Preserve	Stew Pressure seasoning

				<ul style="list-style-type: none"> Why should the chips be spread evenly on the baking tray before cooking? Are chips bad for you? What different seasonings could be used to coat the chips? What is semolina? What is it used for? How could you make your chips crunchier? 		
<p>SPRING 1 Block C Mechanisms</p> <p>How can you do a lot of work with little effort?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Design and make simplistic lever and linkage products Evaluate the success of their outcomes and recommend improvements  <p>Archimedes (287BC – 212BC)</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring levers and their applications Developing practical skills Making a linkages and levers product Evaluating outcomes 	<ul style="list-style-type: none"> What does mechanical advantage mean? What is the difference between the distance travelled by the input rod and the distance travelled by the output rod? What class of lever is a wheelbarrow? How would the movement of the output rod change if you moved the position of the fixed pivot? Can you move a load of marbles with less effort if the fulcrum is nearer to the load? What kind of movement does your linkage create? Are the movements what you expected? If the fulcrum is moved further away from the load, is more force needed to move the load? Why did you select that linkage for your toy? What class of lever is a catapult? What difficulties or challenges did you face in the making of your toy? What happens if you move the fulcrum nearer to the elastic band? What improvements could you make to the linkage system and its movement? How can you make the load travel further? 	Lever Linkage Mechanism	Force Load Effort	
<p>SPRING 2 Block D Food and Nutrition</p> <p>How does food affect your body and mind?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Peel and grate a range of vegetables Add flavour and texture to foods 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring nutrition Explicit teaching of culinary skills and techniques Applying skills Modifying and improving 	<ul style="list-style-type: none"> Are all vegetables better for us eaten raw? What could you use to make food taste sweet, sour or salty? Why does the body need vitamins daily? Does adding sugar or salt to food make it unhealthy? How would your body and mind feel if you ate only cheese sandwiches every day? What is the purpose of the marinade? 	Fibre Nutrition Minerals	Seasoning Claw Bridge	

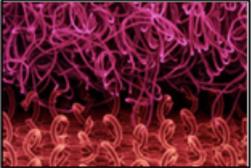
		 <p><i>Noodle salad</i> <i>Stuffed peppers</i> <i>Roasted cauliflower and dip</i></p>		<ul style="list-style-type: none"> Why are peppers a good choice of vegetable to eat? What changes would you make to your final dish and why? Will the pepper look, feel and taste the same before and after cooking? 		
SUMMER 1 Block E	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Identify how things are powered Suggest appropriate energy sources for design problems  <p><i>William Kamkwamba (born 1987)</i> <i>Wind-up, solar-powered torch / radio / charger</i></p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> What energy is and why we need it To identify types of energy To understand how types of energy influence design choices To explore energy in the context of design choices 	<ul style="list-style-type: none"> What is energy? What is the energy source for the human / the plant / the calculator? What is an energy source? How can you control energy? What does intermittent mean? Is the Sun a reliable energy source? Can an appliance have more than one energy source? What happens if an appliance is not connected to an energy source? What type of energy source do you use most? Why is a torch not powered by mains electricity? Why might an appliance have two sources of energy? Why is it important for designers to consider energy sources for their designs? Which energy source is most efficient and practical to power the turbine? (water, wind or electricity) What are the disadvantages of relying on wind to power a boat? What are the advantages and disadvantages of using light to power a calculator? What are the advantages and disadvantages of electric cars? What are the advantages and disadvantages of using candles to light a room? 	<p>Energy Energy source Turbine Source (noun) Source (verb)</p>	<p>Intermittent Renewable (noun) Renewable (adjective)</p>	
SUMMER 2 Block F	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Design and build a beam bridge that can hold 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> To identifying features of bridges 	<ul style="list-style-type: none"> How are the bridges different / similar? How can you span a gap that is larger than 	<p>Gap Deck</p>	<p>Suspension Arch</p>	

	<p>Structures</p> <p>What makes a bridge strong?</p>	<ul style="list-style-type: none"> the weight of 100 pennies Identify and name parts of a bridge <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Sir John Wolfe Barry (1836 – 1918)</p> </div> <div style="text-align: center;">  <p>Sir Horace Jones (1819 – 1887)</p> </div> <div style="text-align: center;">  <p>Tower Bridge (1894)</p> </div> </div>	<ul style="list-style-type: none"> To exploring ways to stabilise a simple structure Application of skills Evaluation and adaptation 	<p>the length of two craft sticks?</p> <ul style="list-style-type: none"> Which parts of the bridge give it strength and stability? Do you need to add more weight to either side of the bridge each time you extend the size of gap you are trying to span? Do all bridges have arches? What happens if you don't add weight to either side of your bridge? Does the shape of a pier affect the strength of the bridge? Is one pier less effective than two? Does it matter what size of arch is used? What changes could you make to increase the weight the bridge will hold? Does adding towers or weights at each side of the bridge increase its stability? How do you know? What features does your bridge have? How did you make them? What would you have to do differently if you were making the bridge from paper instead of cardboard? How could you strengthen your bridge further? What adjustments could you make to enable your bridge to span a wider gap? If your bridge is unstable, how could you solve this problem? Would you do anything differently next time? 	<p>pier</p>	<p>Bascule</p>
<p>4</p>	<p>AUTUMN 1</p> <p>Block A</p> <p>Food and Nutrition</p> <p>What's really in your food?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Make, roll and shape bread dough Make a soup <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Pizza</p> </div> <div style="text-align: center;">  <p>Mini bread rolls</p> </div> <div style="text-align: center;">  <p>Soup</p> </div> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> To exploring nutrition Explicit teaching of culinary skills and techniques To evaluate outcomes 	<ul style="list-style-type: none"> What is gluten? How can you rectify the mistake of adding too much water to the dough mixture? What is dough? What is kneading? What does mass-produce mean? Why is it important to knead and stretch the dough? What additional ingredients are used in mass-produced pizzas? How can you ensure the pizza base does not become soggy during the cooking 	<p>Ingredients Processed Bread</p>	<p>Gluten Knead (verb) Ferment (verb)</p>

				<ul style="list-style-type: none"> process? What is yeast? What is proving? Why is this process necessary in breadmaking? What does fermentation mean? How does the consistency and appearance of bread dough change throughout the kneading and proving processes? How does the fermentation process affect bread dough? How would you compare mass-produced loaves with homemade bread? Why is tinned soup often less healthy? What purpose does the potato serve? Why should we have sugar in moderation? How would you describe the texture of the fresh soup? How could you change the texture? What do you notice about the ingredients of tinned soup? How would you describe the taste of the fresh soup? How could you change the taste? Why is a small amount of sugar used when cooking tomatoes? 		
<p>AUTUMN 2 Block B Mechanism</p> <p>How many ways are there to open a door?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Make a variety of model hinges Make and evaluate hinged products using modelling materials 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring types of hinges Developing practical skills Evaluating outcomes 	<ul style="list-style-type: none"> Why are most hinges made from brass? How is a butterfly hinge different from a butt hinge? What properties does brass have that make it a suitable metal for making hinges from? What are the common uses of a concealed hinge? How many different types of hinges can you find? Which hinge was most effective? What is the difference between a concealed hinge and a butt hinge? What changes would you make to ensure the door opens and closes without snagging? What do you need to do to make sure the net of your box fits together correctly? 	<p>Hinge Knuckle Leaf Pin Barrel</p>	<p>Butt hinge Concealed hinge Net</p>	



London's *Tower Bridge* uses huge hinges to lift up the road to allow boats to pass on the Thames.

				<ul style="list-style-type: none"> • Which types of hinge would be most suitable for the gift box? • Why does the lid need to be slightly bigger than the box? • What would the advantages and disadvantages be of using a butt hinge? • How can you strengthen the joins? How effective was your choice of hinge? • Which type of hinge did you choose to make and why? • How could the stability of your product be improved? • Did you make the right choice for this specific product? • What other materials might have been suitable for making this product? • Do the hinges on your product allow for the doors to open smoothly? • How could you improve the overall appearance of your product? • Do the doors on your product stay open? Are adjustments needed? 		
<p>SPRING 1 Block C Textiles</p> <p>How do you keep a tea towel from slipping off a hook?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Select appropriate fastenings and attach them to fabric • Make a shank for a button <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>George de Mestral (1907 – 1990) Velcro®</p> 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Identification of the problem • Exploring fasteners • Explicit teaching of skills • Application of skills Evaluation and adaptation 	<ul style="list-style-type: none"> • Why are there so many different types of fastener? • Which fastener do you think is most effective? • What are the advantages of using a hook and loop fastener on a shoe? • Why would a zip be used instead of a button? • Why don't we use hook and loop fasteners for everything? • Does it matter if the buttonhole and button are different sizes? What is the purpose of a button shank? • How would you do things differently next time? • Which fastener was the hardest to attach? Why? • Did you select the most suitable fastener for your hanger? 	<p>Shank Burr Hook and loop</p>	<p>Buckle (noun) Fastener Raw edges</p>	
SPRING 2	This term, the children should know how to...	This term, the children should learn...	<ul style="list-style-type: none"> • Does how tightly you roll the paper into a 	structural	Truss	

<p>Block D Structures Which shapes will give a structure stability?</p>	<ul style="list-style-type: none"> • Make triangles to form and join trusses • Identify the forces that affect structures <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">Roma Agrawal (born 1983) <i>The Shard (started 2009 – completed 2012)</i></p>	<ul style="list-style-type: none"> • Exploration of the key question • Exploration of materials and techniques • Conducting investigations relating to the key question • Application of knowledge and skills • Evaluating and modifying 	<p>cylinder affect how strong it is?</p> <ul style="list-style-type: none"> • Where might trusses be used? • Which is strongest: three cylinders made from one sheet of paper, or one cylinder made from lots of cylinders? • What part of your structure is most / least stable? • Does the positioning or size of the cylinders affect how much weight they can withstand? • How can you ensure that everyone has a role in constructing the dome? • What advantage does a truss have over solid wood or metal? • What changes did you have to make to your original design and why? • How do you know that a triangle is stronger and more stable than a square? 	<p>engineer geodesic gravity</p>	<p>Compression Tension</p>
<p>SUMMER 1 Block E Electrical systems How useful are switches?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Incorporate different types of switches into circuits to perform a function <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">Samuel Bagno Inventor of the motion sensor, 1950</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Revisit switches and circuits and the associated vocabulary • Explore different types of switches and how they are used • Create a simple game involving an interruption in a circuit 	<ul style="list-style-type: none"> • What is a circuit? • How many appliances can you think of that have switches? • What is a current? • How many types of switches can you identify? • What is a switch and what is its function? Why is it necessary to interrupt the flow of electricity to appliances? • What is the difference between a trigger and rotary switch? • Why does a toaster / television / stereo have more than one switch? • Why might a motion sensor be used for an outside light? • What would happen if appliances did not have switches? • What type of appliance is likely to have more than one switch? • How many appliances can you think of that have more than one switch? • What would happen if you made the game from wire coated in plastic? How does your game interrupt the flow of electricity? Why is aluminium foil used for the lake in the 	<p>Switch Circuit Component Current</p>	<p>Interruption Unbroken Conductor Multi-purpos e</p>

				Piranha Lake game? <ul style="list-style-type: none"> • How could you incorporate a light into your game? • How are insulating materials used in the game to break the circuit? • How does the wire game act as a switch? • What would happen if fabric was used for the lake? 		
	SUMMER 2 Block F Food and Nutrition Is cheap food always worse for you?	This term, the children should know how to... <ul style="list-style-type: none"> • Peel, grate and chop vegetables to make economical, tasty and healthy food <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Root vegetable rosti</i></p> </div> <div style="text-align: center;">  <p><i>Mexican pasties</i></p> </div> <div style="text-align: center;">  <p><i>Chickpea curry</i></p> </div> </div>	This term, the children should learn... <ul style="list-style-type: none"> • Explicit teaching of culinary techniques • Evaluating outcomes 	<ul style="list-style-type: none"> • What is a root vegetable? • How does the appearance and consistency of the vegetables change as a result of cooking? • Why is processed food likely to be unhealthy? • How could this basic recipe be adapted or improved? • What are the advantages of including root vegetables in your diet? • Where does the pastry originate from? • What would happen if you did not add water to the pastry mix a little at a time? • How did pasties become popular around the world? • What different ingredients could you use for the filling? • Why is it important to keep ingredients cool when making pastry? • Which ingredients would you use to reflect different countries and cultures? (Chinese, Indian etc.) • What is shortening? • What would you change about your pastry? • Why is reducing our meat consumption a good idea? • How could you make your curry less spicy? • Why are chickpeas a good alternative to meat? • What adaptations could you make to your curry? What different vegetables could you use? • What do you like / dislike about your curry? • What are the advantages of making a homemade curry compared to buying a 	Cheap Fusion Texture	Shallow-fry Shortening Fragrant

				pre-prepared one from a shop?		
5	<p>AUTUMN 1 Block A Food and Nutrition</p> <p>Why are our diets so different?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Make, roll and cook a flatbread • Prepare a range of vegetables • Present foods to a high standard <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Flatbread and garlic butter</i></p> </div> <div style="text-align: center;">  <p><i>Smørrebrød</i></p> </div> <div style="text-align: center;">  <p><i>Mezze bowl</i></p> </div> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring diets from different cultures • Explicit teaching of culinary skills and techniques • Evaluating outcomes 	<ul style="list-style-type: none"> • How is flatbread different to traditional bread? • How is the method of cooking flatbread different to how you would cook a traditional loaf of bread? • Why is cold water added to the flour and salt? Is using a pestle and mortar the only way to crush garlic? • How does the consistency and appearance of the dough change as it is kneaded and then cooked? • Why is salt added to the garlic before it is crushed? • What is smørrebrød? • Which ingredients did you select to make your sandwich and why? • How is rye bread different to traditional white bread? • How does a smørrebrød differ from the sandwiches you eat? • What is harissa? • What adjustments would you make to your sandwich and why? • How can the appearance of food be improved? • Where is the Middle East? • Why is natural yoghurt good for you? • Name some Mediterranean countries. How can you increase the nutritional value of the mezze bowl you have made? • Why are chickpeas a good alternative to meat? • How can you increase the visual appeal of the mezze bowl you have made? • What is harissa? 	<p>Culture Presentation Variety Smørrebrød Flatbread mezze</p>	<p>Fibre Knead Unleavened</p>
	<p>AUTUMN 2 Block B Systems</p> <p>How can we keep</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Combine elements of their design knowledge to fulfil a brief 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Understanding and selecting materials • Using fixings and fastenings • Using knowledge of programming to 	<ul style="list-style-type: none"> • What do the words durable, flexible and water-resistant mean? • Which materials are most visible during the day / at night? • Why is reflective material suitable for 	<p>Properties Fastener Algorithm</p>	<p>Fluorescent Reflective attachment point debug</p>

<p>ourselves safe on the road?</p>	 <p>Emily Brooke Inventor of the <i>Laserlight</i> bike light projector</p>	<p>control a product</p>	<p>clothing designed to be worn at night?</p> <ul style="list-style-type: none"> • Why is durability and flexibility important? • What does the word fluorescent mean? • What is a template? • Why is a template necessary? • Why is ease of attachment important? • How did you decide on the attachment points for your belt? Which reflective elements have you included? • How are these attached to the main garment? • Which type of fastener did you select and why? How close is your product to the original design? • What changes did you have to make and why? • What is an algorithm? • How does your night sensor program work? How does the micro:bit attach to the main garment? • What does debug mean? • How does your garment draw attention to the wearer? (lights, sound, messages) Explain the choices you have made. • What does programming mean? 		<p>programming</p>
<p>SPRING 1 Block C Textiles</p> <p>Which fabric is ideal for creating a functional and hardwearing lunch bag?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Use beeswax to waterproof cotton fabric • Repurpose a pair of jeans   <p>Levi Strauss (1829 – 1902)</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Identification of problem • Exploring materials • Specific teaching of skills relating to the brief • Application of skills • Evaluation and adaptation 	<ul style="list-style-type: none"> • What kind of weave makes a fabric translucent? • Why is it important that materials used for food storage are easy to wash? • Which fabrics are likely to be hardwearing? How do you know? • How have the properties of the cotton changed? • Is the cotton now more or less functional? What kinds of fabric are waterproof? • Which clothing items would be more suitable for repurposing and why? • Are all fabrics made with thick threads more rigid? • How could you test materials to see if they would be suitable for use as an insulator? Can the lunchbox keep the food warm or cool? What changes / improvements would 	<p>Durability Repurpose Functional</p>	<p>Beeswax Swatch insulate</p>

<p>SPRING 2 Block D Food and Nutrition</p> <p>What can you learn from different cultures' diets?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Roll and shape ingredients • Slice and ribbon a range of vegetables • Stir-fry vegetables <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Summer rolls</i></p> </div> <div style="text-align: center;">  <p><i>Stir-fry</i></p> </div> <div style="text-align: center;">  <p><i>Bombay potatoes</i></p> </div> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring diets from different cultures • Explicit teaching of culinary skills and techniques • Evaluating outcomes 	<p>you make to your lunch bag?</p> <ul style="list-style-type: none"> • Why does the body need some carbohydrates and fats? • Where in the world is Vietnam? • Why did people need to eat lots of carbohydrates in the past? • What does culture mean? • Why should we eat fewer carbohydrates and more vegetables? • Does adding sugar to the dip and the dressing make it unhealthy? • Name some key flavours and ingredients used in Asian cookery. • What gives the dip and dressing its salty flavour? • Is Asia a continent or a country? • Why is cooking vegetables quickly healthier than cooking them for a long time? • Can you name some traditional Asian ingredients? • What is the 'holy trio'? • Why are ginger and garlic good for you? What are the key flavours in Asian cookery? • What is stir-frying? • What ingredients can provide a sour flavour? • Where is Bombay? • What is this city now called? • Can you find it on a map? • What are the health benefits of including turmeric in our diets? • Do potatoes have any nutritional value? Where do spices come from? • Name some spices traditionally used in Indian cookery. • What does par-boil mean? • Why is spinach a good ingredient to include? • Why is natural yoghurt a good accompaniment to spicy food? 	<p>Culture Migration spices</p>	<p>Medicinal Fragrant Stir-fry (noun) Stir-fry (very)</p>
<p>SUMMER 1 Block E</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Identify and describe ways that frames are 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Identification of the problem 	<ul style="list-style-type: none"> • What does reinforce mean? • Which of the methods of joining materials 	<p>Frame I-beam</p>	<p>Brace Mitre</p>

<p>Structures</p> <p>How are frames strengthened, reinforced and made rigid?</p>	<p>strengthened and reinforced</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Abraham Darby III (1750 – 1789)</p> </div> <div style="text-align: center;">  <p>Iron Bridge (1779)</p> </div> </div> <ul style="list-style-type: none"> • 	<p>Exploring materials</p> <ul style="list-style-type: none"> • Explicit teaching of skills relating to the brief • Application of skills • Evaluation and adaptation 	<p>did you find most successful?</p> <ul style="list-style-type: none"> • Why do joins need to be reinforced? Why was it important for Anderson or Morrison shelters to be very stable and strong? • How do triangles provide stability to a structure? • What kind of reinforcements have you used in your shelter? • Which other shapes are used to provide stability? • What changes did you need to make to your design or structure and why? • What do gussets and braces have in common? • What would you do differently next time? 	<p>Struts</p>	<p>Gussets</p>
<p>SUMMER 2</p> <p>Block F</p> <p>Mechanisms</p> <p>How can you lift a car onto a roof?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Design and make products that use pulleys and gears to lift loads • Evaluate the success of their outcomes and recommend improvements 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring pulleys and gears and their applications • Developing practical skills • Developing designing and problem-solving skills • Evaluating outcomes 	<ul style="list-style-type: none"> • What is a pulley? • What happens if gear wheels are placed too closely together? • What are the two ways pulleys can be used? • How can gears provide a mechanical advantage? • How can the direction of rotation be changed in a pulley system? • Do idler gears have a purpose? • What is a gear? • Do gears placed next to each other always rotate in opposite directions? • Does your mechanical structure fit within the size constraints of the brief? • How could the speed with which the car is lifted be increased /decreased? • How can your structure be made more stable? • How could multiple cars be lifted? • How can you stop the cradle from spinning? • Is the movement of the pulley system smooth? • How could this movement be improved? • What type of structure have you based your design on? • How can the speed of the rotation be 	<p>Gear Pulley Mechanism</p>	<p>Gear train Driver gear idler</p>

				<ul style="list-style-type: none"> stepped down? How rigid and stable is your structure? How could the stability be increased? How can the rotational movement be made smoother? Why have you chosen a particular mechanism? What alternative materials could you have used? 		
6	<p>AUTUMN 1 Block A Food and Nutrition</p> <p>Can street foods save us?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Make a burrito Make and roll bread dough Make a savoury pastry <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Burrito</i></p> </div> <div style="text-align: center;">  <p><i>Pitta bread and hummus</i></p> </div> <div style="text-align: center;">  <p><i>Samosas</i></p> </div> </div>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Exploring nutrition Explicit teaching of culinary skills and techniques Evaluating outcomes 	<ul style="list-style-type: none"> What is street food? Which of your ingredients contain fat? How has the Mexican diet been negatively influenced? Should we remove all fat from our diet? What is a burrito? Is cheese bad for you? What effect do simple sugars have on the body? What are the prominent nutrients found in kidney beans? Which of your ingredients contain Vitamin C? How could you counteract the spiciness of your burrito? Why is strong bread flour used in this recipe? What is hummus? What nutrients does hummus contain? What is yeast? What would happen if you proved the dough for 10 minutes? What does fermenting mean? Why is olive oil an ingredient in hummus? Why should yeast and salt not be mixed? How do you know when the pitta bread is cooked? Pitta bread is a type of flatbread. Can you name some other types of flatbread? What is a samosa? Why are potatoes often used in fillings for pies and pasties? What substance is released as potatoes are 	Street food Culture Snack	Nutrient Prove fry

				<p>cooked?</p> <ul style="list-style-type: none"> • What happens to filo pastry if it is left uncovered for too long? • Why is spinach good for you? How does filo pastry differ from the pastry you have eaten / made before? • What is filo pastry? • True or false? Herbs and spices only provide flavour to food. They do not provide any health benefits. 		
	<p>AUTUMN 2 Block B Mechanisms</p> <p>How do pulleys and gears let you see the world?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> • Design and make a model Ferris wheel powered by gears • Evaluate the success of their outcomes and recommend improvements  <p><i>The London Eye</i> (completed 2000)</p>	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> • Exploring pulleys and their applications • Experimenting with different pulley systems • Developing design and problem-solving skills Developing practical skills • Evaluating outcomes 	<ul style="list-style-type: none"> • How do pulleys create mechanical advantage? • What products use pulleys to lift a load vertically? • What products use a pulley belt system to work? • What directions do the different pulleys rotate? • What are skyscrapers? • How do people get to the top of these tall buildings? • How much string is pulled in comparison to the amount the load is lifted? • What pulley systems are used in lifts? • What is a rack and pinion? • How could you ensure the model is well balanced and stable? • Would your Ferris wheel be able to withstand high winds? • What is a gear train? How could the aesthetics of the design be improved? • What direction do adjacent gears rotate? Does the wheel spin smoothly? • How could this motion be improved? • Does the size of a gear affect how long it takes to make one revolution? • Which is the driver gear? • Which is the driven? • What direction does each gear revolve? • How many gears will your model need? • What sizes will you select and why? • How could the design be adapted to accommodate more passengers? 	<p>Pulley Moveable pulley Fixed pulley</p>	<p>Block and tackle Rack and pinion Driver gear Driven gear</p>

				<ul style="list-style-type: none"> How will you ensure your model Ferris wheel will be strong enough? How could the rotational speed be stepped up or stepped down? 		
SPRING 1 Block C Food and Nutrition Does food affect the way you feel?	This term, the children should know how to... <ul style="list-style-type: none"> Dice, slice, peel, grate and cook a range of vegetables Make a sauce and a stock Use height and colour to improve the visual appeal of food  <p><i>Pasta with tomato sauce</i> <i>Noodle soup</i> <i>A sensory salad</i></p>	This term, the children should learn... <ul style="list-style-type: none"> Exploring healing qualities of food Explicit teaching of culinary skills and techniques Evaluating outcomes 	<ul style="list-style-type: none"> What is the difference between simple and complex carbohydrates? How can you make a dish more salty / sweet / sour? What are the advantages and disadvantages of processed food? How could you make a sauce thicker? How do you know when pasta is cooked? Why is it important to include foods of different colours? What does seasonality mean? How could you improve the presentation of your food? Does a chocolate bar have the same nutritional value as a bowl of pasta? Why is it important for food to look appealing? 	Carbohydrates Staple nutrient	Sauté Translucent dice	
SPRING 2 Block D Structures How strong is a piece of spaghetti?	This term, the children should know how to... <ul style="list-style-type: none"> Construct a flying buttress to support a tower Use appropriate lengths of spaghetti to increase strength and stability  <p><i>Blackpool Tower</i> by architects James Maxwell (1838 – 93) and William Charles Tuke (1843 – 93)</p>	This term, the children should learn... <ul style="list-style-type: none"> Identification of the problem Testing materials Explicit teaching of skills relating to the brief Application of skills Evaluation and adaptation 	<ul style="list-style-type: none"> Does the way the spaghetti is arranged or bundled together determine the amount of weight it can bear? How is the strength and stability of a 3D shape affected by the length of the spaghetti used? How does adding more spaghetti affect the weight it can hold? Why are guy lines effective in supporting tall, upright structures? Can spaghetti strands carry a heavier load when the weight applied is distributed over a wider area? How does a flying buttress improve the stability of a structure? How tall and strong can a tower be made in 18 minutes? How does the number of guy lines used affect the stability of a tower? 	guyed mast flying buttress load	Aesthetic Edifice constraints	

	<p>SUMMER 1 Block E Electrical Systems</p> <p>Can switches perform more than one function?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Use switches to adapt a product in response to a design brief <div data-bbox="631 292 786 491" data-label="Image"> </div> <div data-bbox="824 368 1055 416" data-label="Caption"> <p>Albert Sadacca (1901 – 1978) Inventor of Christmas tree lights</p> </div> <ul style="list-style-type: none"> 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Revisit switches and circuits and the associated vocabulary Explore how multiple switches and components can be included in a circuit Incorporate multiple switches and components into a product to meet a design brief 	<ul style="list-style-type: none"> What are the symbols for a bulb, buzzer and switch? What does multi-function mean? Why do some appliances need switches that perform more than one function? What is a component? How many functions does the switch on a hairdryer perform? True or false? A series circuit can only contain two components. What does simultaneous mean? What might the circuit for a kettle look like? How can you make a buzzer and light work simultaneously? Is it always beneficial to have a switch that performs various functions rather than a number of switches, each performing one function? What type of circuit is needed to make a buzzer and light work independently of each other? Name an appliance that has a switch that performs only one function. What is a design brief? What is the difference between a parallel circuit and a series circuit? How does your product work? Why are mains lights in a house connected in a parallel circuit? How does your product fulfil the design brief? Do we always want components to function independently of each other? 	<p>Switch Parallel circuit Series circuit Component</p>	<p>Functionality Multi-function Brief simultaneous</p>
	<p>SUMMER 2 Block F Textiles</p> <p>How can we reduce, recycle and repurpose?</p>	<p>This term, the children should know how to...</p> <ul style="list-style-type: none"> Make a crochet hook out of a chopstick Use plastic bags and snack packets to create practical items 	<p>This term, the children should learn...</p> <ul style="list-style-type: none"> Identification of the problem Explicit teaching of skills Exploring materials Explicit teaching of skills Application of skills Evaluation and adaptation 	<ul style="list-style-type: none"> What does repurpose mean? Are there other ways that the old T-shirt could be repurposed? Why is it important to recycle materials? Would any type of fabric be suitable to crochet with? What properties does T-shirt fabric have that make it suitable to be repurposed into a heat-resistant mat? 	<p>Recycle Repurpose Reduce skein</p>	<p>Chain Seal (verb)</p>



Isatou Ceesay (born 1972)

- Why is it important to keep the crochet stitches loose?
- What are the properties of plastic that make it so harmful to the environment?
- Could other items be made using the same methods?
- How could you reduce the amount of plastic you use?
- How many plastic bags would be needed to make a small bowl?
- Is it easier or more difficult to crochet with plastic?
- Why would crisp packets be useful as an insulating material?
- What are the advantages of using crisp packet material to make a food storage bag?
- What are the disadvantages?
- What are the properties of the materials used to make crisp packets?
- Are there any other ways crisp packets could be repurposed?
- How many crisp packets would you need to make an insulating blanket for a child?