Design and Technology Long Term Plan

	Nursery	Reception	Year 1	Year 2-	Year 3	Year 4	Year 5	Year 6
Autumn	**Unit Title:**	**Unit Title:**	**Unit Title:** Mechanisms: Wheels and Axles.	**Unit Title:** Mechanical Systems: Levers and sliders	**Unit Title:** Mechanical systems: Pneumatics	**Unit Title:** Structures: Shell structures using CAD.	**Unit Title:** Mechanical Systems: Cams	**Unit Title:** Food: celebrating culture and seasonality.
	Project Title:	**Project Title:**	**Project Title:** Mrs Armitage on wheels Design, make and evaluate a trailer for Mrs Armitage to carry her things.	**Project Title:** Design, make and evaluate a moving story book for a Year 2 class/ your family to teach them about the Great Fire of London.	**Project Title:** Design, make and evaluate a moving creature for younger children to learn about the environment.	**Project Title:** Design, make and evaluate a storage container for someone to store something precious in.	**Project Title:** Design, make and evaluate a shop display with moving parts to advertise a business.	**Project Title:** Design, make and evaluate a food product for a celebration or festival.
	Concepts:	**Concepts:**	**Concepts:** Different ways that wheels and axles can be constructed. Investigate different ways of making axle holders. Marking out, holding, cutting and joining materials.	**Concepts:** Using fixed pivots. Creating linear, reciprocating, rotary and oscillating movements.	**Concepts:** Pivot points. Pneumatics use liquid or air to create movement.	**Concepts:** Creating structures from 2D nets. Using CAD to design 2D nets.	**Concepts:** Creating various cam shapes. Eg: cardboard. Using a hand drill safely. Measuring, marking, cutting, shaping and joining skills using junior hacksaws,	**Concepts:** Measure out, cut, combine and shape. Use appropriate equipment and utensils. Following a basic recipe.

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							G-clamps, bench hooks etc…	
	Powerful Knowledge:	**Powerful Knowledge:**	**Powerful Knowledge:** An axle holds a wheel and lets it turn. An axle needs to go through an axle holder. Friction will slow down the speed a wheel turns.	**Powerful Knowledge:** Explore and use sliders and levers. Understand that different mechanisms produce different types of movement. Know and use technical vocabulary relevant to the project.	**Powerful Knowledge:** Understand and use pneumatic mechanisms. Know and use technical vocabulary relevant to the project.	**Powerful Knowledge:** Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. Develop and use knowledge of how to construct strong, stiff shell structures. Know and use technical vocabulary relevant to the project.	**Powerful Knowledge:** Understand that mechanical systems have an input, process and an output. Understand how cams can be used to produce different types of movement and change the direction of movement. Know and use technical vocabulary relevant to the project.	**Powerful Knowledge:** Know how to use utensils and equipment including heat sources to prepare and cook food. Understand about seasonality in relation to food products and the source of different food products. Know and use relevant technical and sensory vocabulary.
	Key Vocab:	**Key Vocab:**	**Key Vocab:** **Wheel, friction, axle, axle holder, chassis, mechanism**	**Key Vocab:** slider, lever, pivot, slot, bridge/guide card, masking tape,	**Key Vocab:** components, fixing, attaching, tubing, syringe, plunger, split pin, paper	**Key Vocab:** shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex,	**Key Vocab:** cam, snail cam, off-centre cam, peg cam, pear shaped cam	**Key Vocab:** ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda,

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				paper fastener, join pull, push, up, down, straight, curve, forwards, backwards design, make, evaluate, user, purpose, ideas, design criteria, product, function	fastener pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight linear, rotary, oscillating, reciprocating user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate	edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype	follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion annotated sketches, exploded diagrams mechanical system, input movement, process, output movement design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble

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	Cultural Capital:	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital: Explore what Norwich was like in 1666 to provide context to the GFOL.**	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital: Visit an international supermarket for research!**
	Pedagogical Content Knowledge (PCK):	**Pedagogical Content Knowledge (PCK):**	**Pedagogical Content Knowledge (PCK):** POAP document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document
Spring	**Unit Title:**	**Unit Title:**	Continues into Spring 1	Continues into Spring 1	**Unit Title:** Mechanical systems: Levers and Linkages	**Unit Title:** Food discovery (covering two units)	**Unit Title:** Microbits	**Unit Title:** Mechanical systems: Gears and pulleys
	Project Title:	**Project Title:**			**Project Title:** Design, make and evaluate a moving book to tell the reader about something important happening in the world.	**Project Title:** Cooking and Nutrition: Food Discovery	**Project Title:** Design, make and evaluate a robot using microbits	**Project Title:** Design, make and evaluate the fastest pulley driven vehicle in the class.
	Concepts:	**Concepts:**			**Concepts:** Using fixed pivots and loose pivots. Creating linear, reciprocating, rotary and	**Concepts:** Understand and apply the principles of a healthy and varied diet Prepare and cook	**Concepts:** Create an electrical device that contains a microbit using their prior computing	**Concepts:** Create a chassis using prior skills of creating frames.

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					oscillating movements.	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	knowledge and DT skills.	Gear/ pulley size ratios. The best combination of pulleys to create the fastest car.
	Powerful Knowledge:	**Powerful Knowledge:**			**Powerful Knowledge:** Understand and use lever and linkage mechanisms. Distinguish between fixed and loose pivots.	**Powerful Knowledge:** Understand where food comes from and why. Understand why we need a healthy and balanced diet. Understand which food we can grow and why.	**Powerful Knowledge:** Understand that mechanical and electrical systems have an input, process and an output. Understand that the electrical systems can be controlled by an algorithm.	**Powerful Knowledge:** Understand that mechanical and electrical systems have an input, process and an output. Understand how gears and pulleys can be used to speed up, slow down or change the direction of

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								movement. Know and use technical vocabulary relevant to the project. Making secure connections Fault finding in circuits. Using a simple computer control programme to control output devices (bulbs and buzzers)

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	Key Vocab:	**Key Vocab**			**Key Vocab:** 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	**Key Vocab:** organic, sustainability, seasonality, harvest, pollution, habitats, healthy, varied, grown, reared, caught, processed	**Key Vocab:** Evaluating, existing, user, feedback, circuit, microbit, algorithm, input, output, prototype, annotated, drawings, design criteria, model, adapt, product, accurate, programme, debug, assessment, feedback	**Key Vocab:** pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams mechanical system, electrical system, input, process, output design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief 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

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	Cultural Capital:	**Cultural Capital:**			**Cultural Capital:**	**Cultural Capital: Visiting a farm**	**Cultural Capital:**	**Cultural Capital: Trip to lotus** **Formula goblin.**
	Pedagogical Content Knowledge (PCK):	**Pedagogical Content Knowledge (PCK):**			**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):**	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document
Summer	**Unit Title:**	**Unit Title:**	**Unit Title:** Textiles: Templates and joining.	**Unit Title: Food:** Preparing fruit and veg	**Unit Title:** Textiles: 2D shape to 3D product	**Unit Title:** Food discovery (covering two units)	**Unit Title:** Structures: Frame Structures.	**Unit Title:** Textiles: Combining different fabric shapes.
	Project Title:	**Project Title:**	**Project Title:** Lighthouse keeper's lunch Design, make and evaluate a bag for the lighthouse keeper's wife to put his lunch in.	**Project Title:** Design, make and evaluate a fruit snack for a class picnic.	**Project Title:** Design, make and evaluate a wallet or purse for someone to hold money in.	**Project Title:** Cooking and Nutrition: Food Discovery	**Project Title:** Design, make and evaluate a prototype bridge to go across a river.	**Project Title:** Design, make and evaluate a bag or case to contain your stepometer. COMPUTING CROSS CURRICULAR
	Concepts:	**Concepts:**	**Concepts:** Using a template or simple pattern. Using tools to mark out, tape	**Concepts:** Basic food hygiene practices when handling food.	**Concepts:** Different fabric joining techniques Decorative techniques	**Concepts:** Understand and apply the principles of a healthy and varied diet Prepare and cook	**Concepts:** Techniques for building frame structures. Joining straws.	**Concepts:** Threading needles and joining textiles using a range of stitches.

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			or pin fabric to templates or patterns.	Using simple utensils. Food processing skills such as: Washing, grating, peeling, slicing, squeezing. Healthy eating.	Cutting out techniques (templates)	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	Joining thin sectioned pieces of wood. Understanding triangulation and the strength of triangles.	Sewing and shaping curved edges.
	Powerful Knowledge:	**Powerful Knowledge:**	**Powerful Knowledge:** Fabrics can be joined using different methods. Different finishing techniques can be used to add to a design.	**Powerful Knowledge:** Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes, including how	**Powerful Knowledge:** Know how to strengthen, stiffen and reinforce existing fabrics. Understand how to securely join two pieces of fabric together. Understand the need for patterns and seam allowances. Know and use technical	**Powerful Knowledge:** Understand where food comes from and why. Understand why we need a healthy and balanced diet. Understand which food we can grow and why.	**Powerful Knowledge:** Understand how to strengthen, stiffen and reinforce 3-D frameworks. Know and use technical vocabulary relevant to the project.	**Powerful Knowledge:** A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. Fabrics can be strengthened, stiffened and reinforced where appropriate.

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				fruit and vegetables are part of The Eatwell Guide. Know and use technical and sensory vocabulary relevant to the project.	vocabulary relevant to the project.			
	Key Vocab:	**Key Vocab:**	**Key Vocab:** names of existing products, joining and finishing techniques, tools, fabrics and components template, pattern pieces, mark out, join, decorate, finish	**Key Vocab:** fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria	**Key Vocab:** fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance user, purpose, design, model,	**Key Vocab:** organic, sustainability, seasonality, harvest, pollution, habitats, healthy, varied, grown, reared, caught, processed	**Key Vocab:** frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional	**Key Vocab:** seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper

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					evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces			design criteria, annotate, design decisio**ns,** functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype
	Cultural Capital:	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital:**	**Cultural Capital: Visiting a farm**	**Cultural Capital:**	**Cultural Capital:**
	Pedagogical Content Knowledge (PCK):	**Pedagogical Content Knowledge (PCK):**	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document	**Pedagogical Content Knowledge (PCK):** POAP Document