Year Group and Class	Autumn Term	Spring Term	Summer Term
Reception/Year 1 and Year 1 Pine and Cedar	**1.8 PORTABLE SNACKS** Design a portable snack – a wrap	**1.7 WHEEL AND AXLE MECHANISMS** Design a moving vehicle with wheels and axels.	**1.4 SOLID STRUCTURES** Strength and Structure
Breadth Aspects that will be studied	Design a portable snack thinking about purpose and use. Make a portable snack considering ingredients and taste. Use basic principles of healthy and varied diet.	Design a purposeful, functioning and appealing product. Select and use a wide range of materials and components. Explore and evaluate a range of existing products.	Build structures exploring how they can be stronger and more stable. Explore and evaluate existing products. Evaluate ideas and products against design criteria.
Threshold Concepts Big ideas explored through each topic - (master practical techniques; take inspiration from design throughout history; and design, make, evaluate and improve	Master practical skills – Grating, peeling, slicing, folding, spreading Design, make, evaluate and improve. Take inspiration from design – packaged pre-prepared wraps	Master practical skills – Measuring, cutting, estimating, assembling, joining Design, make, evaluate and improve. Take inspiration from design – A wheeled vehicle	Design, make, evaluate and improve. Take inspiration from design– A mountain, a wall, a brick garage
Milestones – the goals pupils should reach to show that they are meeting the expectations of the curriculum	Cut, peel and grate ingredients safely and hygienically using tools. Assemble ingredients.	Demonstrate a range of joining techniques. Create a product using wheels and axels. Design and make products that have a clear intended purpose. Use software to design	Explore bridges through time identifying likes and dislikes. Explore how products have been created. Join materials to strengthen products. Use software to design

Year 1 / 2 and Year 2 Willow and Cherry	**1.3 FRAME STRUCTURES** Design a frame structure such as a chair for a toy	**1.5 SLIDER MECHANISMS** To design and make Slider Mechanisms	**1.8 COUSCOUS DISH** Design and make a healthy couscous meal
Breadth	Build structures exploring how they can make a free standing frame more stable, consider strength and safety. To design and create a frame structure. To consider purpose, user, materials and features.	To design and make a slider mechanism. To consider purpose and audience in design. To use techniques of cutting and joining to make mechanisms. To make prototypes and then improvements, evaluating.	To design and make a couscous dish considering nutrition and ingredients Think about purpose, users and safety in making the dish. Consider healthy eating and dietry requirements e.g vegetarian. Take inspiration, apply techniques and decide on ingredients.
Threshold Concepts	Master Practical Skills – Measuring, cutting, joining with glue Design, make, evaluate, improve. Take inspiration from design – swing set, chair	Master Practical Skills – cutting, measuring, estimating, assembling, gluing, joining Design, make, evaluate, improve. Take inspiration from design – Slider pictures and cards	Master Practical Skills – Peeling, slicing, chopping, snipping, weighing, stirring Design, make, evaluate, improve. Take inspiration from design – Various couscous dishes
Milestones	Demonstrate a range of cutting (safely using tools), shaping and joining techniques. Measure and mark out to the nearest cm Explore how products have been created.	Demonstrate a range of cutting (safely using tools), shaping and joining techniques. Explore how products have been created. Make products, refining design as work progresses. Suggest improvements to existing designs.	Cut, peel and grate ingredients safely using tools. Measure or weigh using measuring cups or electronic scales. Assemble and cook ingredients.

	Make products, refining design as work progresses Use software to design	Design products that have a clear purpose and intended user	
Year 3 **Maple**	**2.4 LINKED LEVERS** Design and make linked lever mechanism – a grabber	**2.8 VEGETABLE SOUP** Design and make vegetable soup	**2.6 FRAMED STRUCTURES** Design and make a framed structure - bridge
Breadth	Design and make a linked lever mechanism. Explore pivots, fulcrum, inputs and outputs Measure and cut lengths of wood, use drills and different ways of joining. Looking at pivots, levers and stands.	Design and prepare vegetable soup thinking about users, purpose and features. Practise food preparation techniques	Use design inspiration to design and make a truss bridge. Consider strength by triangulation Consider purpose and intended users
Threshold Concepts	Master Practical Skills - Measuring, cutting, estimating, assembling, joining Design, make, evaluate, improve. Take inspiration from design -a mechanical grabber	Master Practical Skills - Peeling, chopping, snipping, stirring, measuring, frying, simmering Design, make, evaluate, improve. Take inspiration from design – a variety of tinned/prepared soups chunky and smooth	Master Practical Skills - Measuring, cutting, estimating, assembling, joining. Design, make, evaluate, improve. Take inspiration from design - Truss bridge
Milestones	Cut materials accurately and safely by selecting appropriate tools. Select appropriate joining techniques	Prepare ingredients hygienically using appropriate utensils. Peel, chop, juice, crush, blend. Measure ingredients to the nearest gram accurately.	Choose suitable techniques to construct products or to repair items.

	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product Choose suitable techniques to construct products Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design.	Follow a recipe. Assemble or cook ingredients (controlling temperature of the oven or hob) Improve upon existing designs, giving reasons for choices. Refine work and techniques as work progresses, continually evaluating the product design.	Strengthen materials using suitable techniques Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product. Design with purpose by identifying opportunities to design. Make products by working efficiently Refine work and techniques as work progresses, continually evaluating the product design. Identify some of the great designers in all of the areas of study to generate ideas for designs. Improve upon existing designs, giving reasons for choices. Disassemble products to understand how they work. Use software to design
Year 4 **Holly**	**2.3 PAPER CIRCUITS** Make a light up Christmas/Greetings card	**2.9 DIPS** To design and make a dip party starter	**2.5 PNEUMATICS** To design and make a pneumatic or hydraulic mechanism – a lifter

Breadth	To explore switches, LEDS, circuits, cells. To design an illuminated greetings card - a circuit considering purpose and user. To consider materials, components and techniques	Design a dip to present as a party starter considering dietry requirements of user, purpose and features- consider flavours, likes and dislikes of user. To consider available seasonal produce	Understand how inputs and outputs effect the direction of force Apply knowledge of levers and frame structures
Threshold Concepts	Master practical techniques – measuring, cutting, punching holes, estimating, assembling components, joining Take inspiration from design – illuminated greetings cards Design, make, evaluate and improve.	Master practical techniques – weigh, stir, measure, juice, blend, crush, assembling components Take inspiration from design – guacamole, salsa, hummus, garlic dip Design, make, evaluate, improve/adapt	Master practical skills of cutting, measuring, estimating, assembling, joining. Experiment with pistons, cylinders and connecting tubes Take design inspiration from a crane and rising platform Design, make, evaluate, improve
Milestones	Create products using electronics kits that employ a number of components (such as LEDs and resistors). Use innovative combinations of electronics (or computing) and mechanics in product designs. Evaluate the design of products so as to suggest improvements to the user experience.	Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). Design with the user in mind considering what the product will offer.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product Make protoypes and modify Evaluate the design of a product to improve the user experience and success.

	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate.	Create prototypes and make refinements, enhancements and adaptations Ensure product has a high-quality finish and consider appearance of product and garnish.	
Year 4/5 **Hazel**	**2.3 PAPER CIRCUITS** Make a light up Christmas/Greetings card	**2.9 DIPS** To design and make a dip party starter	**2.5 PNEUMATICS** To design and make a pneumatic or hydraulic mechanism – a lifter
Breadth	To explore switches, LEDS, circuits, cells. To design an illuminated greetings card - a circuit considering purpose and user. To consider materials, components and techniques	Design a dip to present as a party starter considering dietry requirements of user, purpose and features- consider flavours, likes and dislikes of user. To consider available seasonal produce	Understand how inputs and outputs effect the direction of force Apply knowledge of levers and frame structures
Threshold Concepts	Master practical techniques – measuring, cutting, punching holes, estimating, assembling components, joining Take inspiration from design – illuminated greetings cards	Master practical techniques – weigh, stir, measure, juice, blend, crush, assembling components Take inspiration from design – guacamole, salsa, hummus, garlic dip Design, make, evaluate, improve/adapt	Master practical skills of cutting, measuring, estimating, assembling, joining. Experiment with pistons, cylinders and connecting tubes

	Design, make, evaluate and improve.		Take design inspiration from a crane and rising platform Design, make, evaluate, improve
Milestones	Create products using electronics kits that employ a number of components (such as LEDs and resistors). Use innovative combinations of electronics (or computing) and mechanics in product designs. Evaluate the design of products so as to suggest improvements to the user experience. Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate.	Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). Design with the user in mind considering what the product will offer. Create prototypes and make refinements, enhancements and adaptations Ensure product has a high-quality finish and consider appearance of product and garnish.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product Make protoypes and modify Evaluate the design of a product to improve the user experience and success.
Year 5 / 6 **Chestnut**	**3.9 BREAD** To design and make loaf/rolls/shaped bread	**3.4 ARCH STRUCTURES** To design and build an arched shelter/building	**3.6 PULLEYS AND GEARS** To design and use pulleys/gears in a system – cable car/gondola

Breadth	Take inspiration from existing products to design and make a bread. Explore different varieties of bread	To design and build and arched structure product (building or shelter) To consider strength of true arches and modern arches and weight transference. Create annotated diagrams using software	To design and make a pulley system cable car/gondola Experiment with a variety of gear trains and pulleys – use simple pulley systems, assemble gears
Threshold Concepts	Master practical techniques – weighing, sieving, measuring, kneading Take inspiration from design – basic rolls, fruit bread, pizza, shaped breads Design, make, evaluate and improve.	Master practical techniques – Measuring, cutting, estimating, joining, assembling. Take inspiration from design – curved houses and buildings e.g.office in China that was designed by Zaha Hadid Architects, a British firm that is based in London (see Chris Quigley folder for images) Design, make, evaluate and improve.	Pulleys and gears as mechanisms used in combination to change speed and direction for mechanical advantage Master practical techniques – Measuring, cutting, estimating, assembling, joining Take inspiration from design - Sugarloaf mountain gondola (aerial tramway) Design, make, evaluate and improve.
Milestones	Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques.	Show an understanding of the qualities of materials in order to choose appropriate tools to cut and shape Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding. Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.	Show an understanding of the qualities of materials in order to choose appropriate tools to cut and shape Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding. Combine elements of design from a range of inspirational designers

	Create and refine recipes, including ingredients, methods, cooking times and temperatures. Design with a user in mind, motivated by the service a product will offer. Ensure products have a high-quality finish. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience.	Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience. Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs. Use software to design	throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience. Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs
Year 6 **Sycamore**	**KITCHEN GARDEN** To design, maintain and utilise a kitchen garden		**2.7 SHELL STRUCTURES** To design and make a piece of furniture using CAD
Breadth	To design and create a Kitchen Garden considering factors for starting a kitchen garden, seasonality, information from seed packets, non-native fruits, space and intended users		Use CAD to design and make shell structures – a piece of furniture
Threshold Concepts	Master practical techniques – use of garden tools, recognition and use of appropriate seeds, digging, measuring areas Take inspiration from design – Refer to stately home gardens e.g speke hall, community gardens e.g.Incredible edible knowsley and croxteth community garden and other school gardens e.g RHS school garden campaign		Master practical techniques – Measuring, cutting, estimating, assembling, joining, CAD

	Design, make, evaluate and improve	Take inspiration from design – animal shells, chairs, igloos, shelters Design, make, evaluate and improve
Milestones	Design with user in mind, motivated by the service a product will offer. Combine elements of deign from a range of inspirational designers throughout history, giving reasons for choices Evaluate the design of products so as to suggest improvements to the user experience. Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience. Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs.	Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or using a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials in order to choose appropriate tools to cut and shape (e.g. the nature of fabric may require sharper scissors than would be used to cut paper). Use software to design