



Granby Primary School

Design and Technology Progression Document



		<u>Intent</u> Objectives; Skills; Knowledge	<u>Implementation</u> Teaching; Activities	Resources
Year 1	Topic: Me, You, Us! Unit: Wheels and Axels	<ul style="list-style-type: none"> • Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move • Creating clearly labelled drawings which illustrate movement • Following a design to create moving models that use levers and sliders • Adapting mechanisms • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience • Testing mechanisms, identifying what stops wheels from turning • Identifying what mechanism makes a toy or vehicle roll forwards • Learning that for a wheel to move it must be attached to an axle 		<ul style="list-style-type: none"> • Straws • Paper • Masking tape • Scissors • Ruler • toilet rolls • yoghurt pots • cardboard boxes • straws • dowel • Wooden wheel • card discs • plastic cotton reels • Items with wheels, eg: bicycles, tricycles, trundle wheels, toy cars, skateboards, trolleys • Optional - materials for decorating the vehicles, eg: tissue paper, glitter, googly eyes
	Topic: Toys and Games Unit: Moving Story Book	<ul style="list-style-type: none"> • Explaining how to adapt mechanisms, using bridges or guides to control the movement • Designing a moving story book for a given audience • Creating clearly labelled drawings which illustrate movement • Following a design to create moving models that use levers and sliders • Adapting mechanisms • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience • Learning that levers and sliders are mechanisms and can make things move • Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make • Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement 	<p>TASK 1 In table groups, each have a different book. Look through and explore the moving parts. Evaluate one moving part and feedback to the class.</p> <p>TASK 2 Follow set of instructions to make a slider.</p> <p>All Follow instructions to make a lever.</p> <p>EXT: Make a seesaw/moving teddy</p>	<ul style="list-style-type: none"> • A teddy bear or toy • Lollipop sticks or 2cm wide strips of stiff card – 2cm wide • A4 card • Card for bridges – strips of 2cm x 10cm • Card or thick paper • Scissors • Glue sticks • Colouring pens/pencils • Optional: thin pieces of card to make bridges or guides



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			All Follow instructions to make a wheel.	
			Draw equipment	
			Allow chn to work independently to make a piece of play equipment.	
	Topic: Brilliant Britain Unit: Constructing a Windmill	<ul style="list-style-type: none"> • Learning the importance of a clear design criteria • Include individual preferences and requirements in a design • Making stable structures from card, tape and glue • Following instructions to cut and assemble the supporting structure of a windmill • Making functioning turbines and axles which are assembled into a main supporting structure • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't • Suggest points for improvements • Describing the purpose of structures, including windmills • Learning how to turn 2D nets into 3D structures • Learning that the shape of materials can be changed to improve the strength and stiffness of structures • Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses • Understanding that windmill turbines use wind to turn and make the machines inside work • Understanding that axles are used in structures and mechanisms to make parts turn in a circle • Developing awareness of different structures for different 		<ul style="list-style-type: none"> • Empty packaging • Thin card • Scissors • Crayons/pencils • Glue sticks • Tape • Stiff card • Felt tip pens • Drawing pins/ pipe cleaners • Blue tack or plasticine • Optional: junk materials in the shape of cylinders wider than kitchen roll tubes • Optional: coloured card, glitter, tissue paper, textured card, felt



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<p>Topic: What is growing in our garden? Unit: Fruit & Veg</p>	<p>Topic: What is growing in our garden? Unit: Fruit & Veg</p>	<ul style="list-style-type: none"> • Chopping fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruits and vegetables grow • Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging • Understanding the difference between fruits and vegetables • Describing and grouping fruits by texture and taste 	<p>TASK 1 Searching for seeds – investigate some pre prepared pieces of fruit/veg. Explore and write the name under fruit/veg.</p> <p>TASK 2 Using the fruits/veg draw and label into two sections in their books. Make sure chn draw and label those they thought were vegetables but are actually fruits</p>	<ul style="list-style-type: none"> • A selection of fruits and vegetables • Plastic cups • Paper plates • Blenders • Butter knives • Baby carrots • Pineapples • Mangos • Green apples • Green grapes • Bananas • Spinach leaves • Strawberries • Cucumbers • Chopping boards • Paper/hand towels • Disposable cups (one per pupil) • Optional: water or orange juice to thin down the smoothies
	<p>Topic: Pirates! Unit: Textile</p>	<ul style="list-style-type: none"> • Using a template to create a design for a puppet • Cutting fabric neatly with scissors • Learning different ways in which to join fabrics together: pinning, stapling, gluing 	<p>All Taste the ingredients in the smoothies and identify if they like them or not</p> <p>All Depending on which smoothie they liked more of the ingredients, they can then make & taste this smoothie.</p> <p>All Chn in groups depending on the smoothie they wanted to make. Chn prepare the fruits and vegetables.</p> <p>All Design a smoothie carton for their chosen smoothie</p>	<p>All Set x2 tables of each with the appropriate joining equipment – chn in groups move between them to complete the three joins</p> <ul style="list-style-type: none"> • Staples/stapler • Felt, roughly 2xA4 per child • Fabric glue • Safety pins



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		<ul style="list-style-type: none">• Using joining methods to decorate a puppet• Sequencing steps for construction• Reflecting on a finished product, explaining likes and dislikes	<p>TASK 1 Design a pirate templates.</p> <p>TASK 2 Using a template, cut out their two pieces of material</p>	<ul style="list-style-type: none">• Scissors• Wool• Buttons• Ribbon
			<p>TASK 1 have table stations set up like the joining fabrics lesson – chn go to the one they need to joint their fabric</p> <p>TASK 2 Following their design, continue making their puppet by gluing on other materials</p>	



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		<u>Intent</u> Objectives; Skills; Knowledge	<u>Implementation</u> Teaching; Activities	Resources
Year 2	Topic: Unit: Pouches	<ul style="list-style-type: none"> Designing a pouch Selecting and cutting fabrics for sewing Decorating a pouch using fabric glue or running stitch Troubleshooting scenarios posed by teacher Evaluating the quality of the stitching on others' work Discussing as a class, the success of their stitching against the success criteria Identifying aspects of their peers' work that they particularly like and why Joining items using fabric glue or stitching Identifying benefits of these techniques Threading a needle Sewing running stitch, with evenly spaced, neat, even stitches to join fabric Neatly pinning and cutting fabric using a template 	<p>Children practice running stitch on a piece of felt.</p> <p>Pupils needing extra support: May need support threading the needle and tying the knots.</p> <p>Pupils working at greater depth: May need to try sewing a running stitch around a corner or on two pieces of fabric (to join them).</p> <hr/> <p>Cut out template, pin to fabric, cut out fabric.</p> <p>Pupils needing extra support: May need support pinning and cutting their fabric (using the sharpest part of the scissors - the part nearest the handle).</p> <p>Pupils working at greater depth: Should have neat straight cuts on their fabric - possibly re-trimming it to ensure that the edges are tidy, taking care not to take too much fabric off.</p> <hr/> <p>Children sew round the sides of their pouch.</p> <p>Pupils needing extra support: May need support threading needles and tying knots.</p> <p>Pupils working at greater depth: Should ensure that their stitches are equal in size, close together and run in a straight line (along the edge of the three fabric edges).</p>	<ul style="list-style-type: none"> Felt Pins Needles Thread/embroidery thread Scissors



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		<p>Children choose their favourite design and decorate their pouch by stitching or gluing as appropriate.</p> <p>Pupils needing extra support: May need support with attaching smaller more fiddly pieces.</p> <p>Pupils working at greater depth: Should follow their designs accurately.</p>	
Topic: Unit: Balanced Diet	<ul style="list-style-type: none"> • Designing a healthy wrap based on a food combination which work well together • Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief • Describing the taste, texture and smell of fruit and vegetables • Taste testing food combinations and final products • Describing the information that should be included on a label • Evaluating which grip was most effective • Understanding what makes a balanced diet • Knowing where to find the nutritional information on packaging • Knowing the five food groups 	<p>Children look at labels on different drinks containers to see how much sugar it contains and record what they find.</p> <p>Blind taste test in groups - touch, then smell and finally taste. Record what they felt, smelt and tasted and record the general consensus on the board.</p> <p>Choose taste combinations from veg, protein and dairy plates and record their favourite three combinations.</p> <p>Use ideas template to design three different healthy wraps.</p> <p>Choose favourite final design and draw and label it on A4 paper.</p> <p>Children make their own wraps.</p> <p>Evaluate finished wrap using wrap review.</p>	<ul style="list-style-type: none"> • 4 Soft drinks • Empty drinks containers • Whiteboards and pens • 100g of sugar • Range of vegetables, proteins, and dairy products cut into small shapes • Cocktail sticks • A4 paper • A knife and ingredients to demonstrate safe cutting techniques • Chopping boards • Peelers • Cleaning equipment • Knives • Ingredients the children have chosen for their wraps



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Topic: Unit: Fairground Wheel	<ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motions • Designing a wheel • Selecting appropriate materials based on their properties • Making a structure according to design criteria • Creating joints and structures from paper/card and tape • Making linkages using card for levers and split pins for pivots • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used • Cutting and assembling components neatly • Selecting materials according to their characteristics • Following a design brief • Evaluating own designs against design criteria • Using peer feedback to modify a final design • Evaluating different designs • Testing and adapting a design • Learning that mechanisms are a collection of moving parts that work together in a machine • Learning that there is an input and output in a mechanism • Identifying mechanisms in everyday objects • Learning that a lever is something that turns on a pivot • Learning that a linkage is a system of levers that are connected by pivots • Exploring wheel mechanisms • Learning how axels help wheels to move a vehicle 	<p>Exploring a variety of wheels to think about how they work.</p> <p>Look at images of Ferris wheels and discuss.</p> <p>Begin to design a fairground wheel for the city.</p>	<ul style="list-style-type: none"> • Whiteboards and pens • Lolly sticks • Dowel • Straws • Cocktail sticks • Cardboard • Split pins • Cotton reels • Paper straws • Yogurt pots • Tape • Glue • Scissors • Items with wheels, eg: bicycles, tricycles, trundle wheels, toy cars, skateboards, trolleys
	<p>Children to discuss and explore different materials, discussing their appropriateness for different parts of the fairground wheel.</p>		
	<p>Building a moving wheel and frame.</p> <p>Pupils needing extra support: Should talk through their plans before they start. They may also need support with the motor skills required for assembly.</p> <p>Pupils working at greater depth: Should be encouraged to make predictions based on evidence.</p>		
	<p>Support children to add pods and decorations to their wheels.</p> <p>Pupils needing extra support: May need support measuring and cutting materials.</p> <p>Pupils working at greater depth: Should ensure that measurements and materials match their plans or be able to explain any changes made.</p> <p>Orally evaluate designs.</p>		



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Topic: Unit: Moving Monster	<ul style="list-style-type: none"> • Creating a class design criteria for a moving monster • Designing a moving monster for a specific audience in accordance with a design criteria • Selecting appropriate materials based on their properties • Making linkages using card for levers and split pins for pivots • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used • Cutting and assembling components neatly • Selecting materials according to their characteristics • Following a design brief • Evaluating own designs against design criteria • Using peer feedback to modify a final design • Evaluating different designs • Testing and adapting a design • Learning that mechanisms are a collection of moving parts that work together in a machine • Learning that there is an input and output in a mechanism • Identifying mechanisms in everyday objects • Learning that a lever is something that turns on a pivot • Learning that a linkage is a system of levers that are connected by pivots • Exploring wheel mechanisms • Learning how axels help wheels to move a vehicle 	<p>Investigation – Product analysis 1 – pictures of levers etc</p> <p>Pupils needing extra support: Repetition and physical examples of products from the Levers and Linkages worksheet.</p> <p>Pupils working at greater depth: Challenge the children to find items from within the classroom that have levers and linkages, similar to those within the worksheet.</p> <p>Product analysis 2 – Toys: ask children to sketch their favourite toy and say why they like it so much.</p>	<ul style="list-style-type: none"> • A selection of mechanical and non-mechanical objects • Pencils • Colouring pencils • Pre-cut card strips made from thin and thick card (approximately 2cm x 15cm) • Thin and thick card for children to experiment with • Paper fasteners/split pins • Scissors • Plasticine or rubbers • Rulers • Glue sticks • Masking tape • Materials that can be used to make monster features (cotton wool, felt, wool, foil, carrier bags, buttons, lollipop sticks, pipe-cleaners, etc.)
		<p>Design Ideas: Sketching two different design ideas for their monsters and colouring them in. Adding arrows to their designs to indicate the parts that move and the direction of movement. Drawing a diagram of the linkage systems they have chosen based on the parts they want to move and the direction of movement.</p> <p>Pupils needing extra support: Should be given a simple linkage system to work with but should be encouraged to label the pivots and motion themselves.</p> <p>Pupils working at greater depth: Should be able to devise their own linkage systems as well as more sophisticated versions.</p>	



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Year 2	Unit: Constructing a Castle		<p>Children explore making different types of linkage, making the holes safely themselves</p>	
			<p>Children make their own moving monster using a template or from their own design and pre-cut strips of card to construct their linkage system (or make their own levers/linkage system).</p>	
		<ul style="list-style-type: none"> • Designing a castle with key features to appeal to a specific person/ purpose • Drawing and labelling a castle design using 2D shapes, labelling: - the 3D shapes that will create the features - materials need and colours • Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs • Identifying features of a castle • Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension • Extending the knowledge of wide and flat based objects are more stable • Understanding the terminology of strut, tie, span, beam • Understanding the difference between frame and shell structure 		<ul style="list-style-type: none"> • Rulers • Large selection of 2D shapes • 3D maths shapes • Scissors • Glue sticks • Blue tac • Tape • Toilet/kitchen roll tubes, packaging, etc • A4 paper • A3 card • A3 coloured card • Optional: printed textures, eg: stone tiles, brickwork, etc • Optional: squared paper



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Year 3	Unit: Eating Seasonally	<ul style="list-style-type: none"> • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe • Establishing and using design criteria to help test and review dishes • Describing the benefits of seasonal fruits and vegetables and the impact on the environment • Suggesting points for improvement when making a seasonal tart • Learning that climate affects food growth • Working with cooking equipment safely and hygienically • Learning that imported foods travel from far away and this can negatively impact the environment • Learning that vegetables and fruit grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefits • Learning to use, store and clean a knife safely 		<ul style="list-style-type: none"> • Bananas • Watermelon • Strawberries • Lychees (fresh or tinned) • Plum sauce • Range of seasonal vegetables • Stock cubes • Cream • Butter • Seasoning • Wooden skewers • Cooking equipment • Tablets and computers • Paper bowls and spoons • Large baking dishes or multiple smaller ones • Bowls • Whiteboards and pens



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	Unit: Static Electricity	<ul style="list-style-type: none">• Designing a game that works using static electricity, including the instructions for playing the game• Identifying a design criteria and a target audience• Making an electrostatic game, referring to the design criteria• Using a wider range of materials and equipment safely• Using electrostatic energy to move objects in isolation as well as in part of a system• Learning to give constructive criticism on own work and the work of others• Testing the success of a product against the original design criteria and justifying opinions• Understanding what static electricity is and how it moves objects through attraction or repulsion• Generating static electricity independently• Using static electricity to make objects move in a desired way		<ul style="list-style-type: none">• Plastic straws• Plastic bottle• Dusters/cloths- at least 6• Pack of balloons• Empty drinks cans- at least 6• Disposable cup with a hole in the bottom• Container of water• Glitter/confetti/small pieces of paper• Plastic comb, fork and bat• Piece of felt• Tissue paper (different colours)• Card/cardboard• A range of materials and equipment to make pupils' electrostatic games – such as: scissors, tape, glue stick/PVA, hole punches, paper clips, straws, string/thread, lollipop sticks, pipe cleaners, tin foil, paper cups/plates, coloured paper, balloons, dusters/cloths, empty packaging (tissue and shoe boxes, plastic bottles, lids, yoghurt pots etc.)
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	Unit: Pneumatic Toys	<ul style="list-style-type: none">• Designing a toy which uses a pneumatic system• Developing design criteria from a design brief• Generating ideas using thumbnail sketches and exploded diagrams• Learning that different types of drawings are used in design to explain ideas clearly• Creating a pneumatic system to create a desired motion• Building secure housing for a pneumatic system• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy• Selecting materials due to their functional and aesthetic characteristics• Manipulating materials to create different effects by cutting, creasing, folding, weaving• Using the views of others to improve designs• Testing and modifying the outcome, suggesting improvements• Understanding how pneumatic systems work• Learning that mechanisms are a system of parts that work together to create motion• Understanding that pneumatic systems can be used as part of a mechanism• Learning that pneumatic systems force air over a distance to create movement		<ul style="list-style-type: none">• Balloon• Tape• Small, lightweight toy• Syringes (two the same size and one of a different size)• Tubing to connect the syringes (40-50cm lengths of plastic tubing, approximately 5mm diameter)• Mild disinfectant• Masking tape• A few books• Some sandwich bags• A box with a hinged lid• Pencils• Colouring pencils• Bottles• Tape or elastic bands• Glue• Scissors• Paper fasteners/split pins• Packaging/recycled materials (egg cartons, tissue/shoe boxes, etc.)• Materials to make the pneumatic toys (card, straws, pipe cleaners, cotton wool, buttons, bottles, socks, plastic bags, stuffing etc.)• Materials for details, eg: tissue paper, textures paper/sandpaper, feathers, pom poms, googly eyes, sequins.
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	Unit: Cushions	<ul style="list-style-type: none">• Designing and making a template from an existing cushion and applying individual design criteria• Following design criteria to create a cushion• Selecting and cutting fabrics with ease using fabric scissors• Sewing cross stitch to join fabric• Decorating fabric using appliqué• Completing design ideas with stuffing and sewing the edges• Evaluating an end product and thinking of other ways in which to create similar items• Threading needles with greater independence• Tying knots with greater independence• Sewing cross stitch and appliqué• Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance• Understanding that fabrics can be layered for affect		<ul style="list-style-type: none">• Scraps of fabric• Needles• Threads• Needle threaders• A3 paper• A range of fabrics• Pins• Scissors• Stuffing (can be purchased or made from thick scraps of fabric)
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		<u>Intent</u> Objectives; Skills; Knowledge	<u>Implementation</u> Teaching; Activities	Resources
Year 4	Unit: Slingshot Car	<ul style="list-style-type: none"> • Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design • Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance • Learning that products change and evolve over time • Learning that all moving things have kinetic energy • Understanding that kinetic energy is the energy that something (object person) has by being in motion 	<p>Look at the history of cars. Show class the demonstration piece and explain the design brief.</p> <p>Model how to build the chassis. Children make their chassis ready to test in the next lesson.</p> <p>*Ask them to bring in a toy car for the next lesson.</p> <p>Support – break down the process into small steps.</p> <p>Challenge – compare benefits with drawbacks of adding reinforcement bars across the chassis.</p> <hr/> <p>Discuss the meaning of air resistance. Look at car designs and consider how they are “fit for purpose”. Decide on ideas for the design brief. Ask pupils to communicate their design ideas by drawing the car bodies on the <i>Car Body Design Template</i> in 2D, from different angles (front, bird’s eye and side view). Children should also include any graphics and label any additional features in their designs.</p> <p>Support – use of TA for assistance</p> <hr/> <p>Using a child’s design, demonstrate how to draw a net. Class create the panels and apply graphics. They construct the car by assembling each panel one at a time.</p> <p>Support – use of TA for assistance with drawing around their chassis, have some pre-cut tabs available</p> <p>Challenge – encourage more sophisticated car body designs</p> <hr/> <p>Pupils assemble their car bodies to the chassis. Carry out time trials and record the results. Evaluate the cars on the sheet.</p> <p>Support – prompt to identify why some cars are faster.</p> <p>Challenge – Test other aspects of their design and draw on a wide range of conclusions as to the ways their car could be improved.</p>	<ul style="list-style-type: none"> • 4mm dowel rod, roughly 1.5 cm longer than a straw • Drinking straws • Wheels; either plastic with 3mm-4mm holes, or 38mm MDF wheels with 4mm holes • Paperclips • Lollipop sticks • Elastic bands • Masking tape • Glue guns/ PVA glue • Scissors • Glue sticks • Stop watches • Drawing and colouring pencils or pens • Plastic cups/ building blocks/ cushions • A4 card • Coloured card



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Unit: Adapting a Recipe	<ul style="list-style-type: none"> • Designing a biscuit within a given budget, drawing upon previous taste testing • Following a baking recipe • Cooking safely, following basic hygiene rules • Adapting a recipe • Evaluating a recipe, considering: taste, smell, texture and appearance • Describing the impact of the budget on the selection of ingredients • Evaluating and comparing a range of products • Suggesting modifications • Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits • Understanding the environmental impact on future product and cost of production 	<p>Children will be designing a recipe and packaging for a pack of biscuits costing £1.99. They carry out a taste test. They work as a group to follow the recipe and make a batch of biscuits.</p>	<ul style="list-style-type: none"> • Six different types of biscuits • Plates • For each batch of biscuits: 250g butter, 140g caster sugar, 1 egg, 2 tsp vanilla extract, 300g plain flour • Chocolate chips • Sprinkles • Spices • Food colouring • Food flavouring • Chocolate chunks • Dried fruits • Cocoa powder • Honey • Oats • Butter knives • Bowls • Wooden spoons • Scales • Baking trays • Baking paper • Access to an oven
	<p>Each group will make their basic mixture and split the dough between them. Individually, children will then add small amounts of additional ingredients to modify the recipe.</p> <p>In groups children explain how they modified their biscuit. The group trials it and evaluates using the sheet.</p>		
	<p>In groups, children plan their biscuit recipe ensuring it comes within the £1.99 budget.</p> <p>They work together to complete the <i>Budget Sheet</i>.</p> <p>You should price the extra ingredients appropriately.</p> <p>Share with the children the additional ingredients available to buy (either as a list or lay them out like a shop for children to view portion sizes).</p> <p>Each pupil in the group will also need to complete a <i>Final Design</i> – an individual vision of how their group’s biscuit would look on the shelves.</p> <p>When judging occurs in the next lesson, one <i>Final Design</i> from the group will be presented with the group budget.</p>		
	<p>Each child has a role to perform in biscuit preparation. In groups, children will make one batch of their final recipe using a basic biscuit recipe.</p> <p>Whilst as many groups as you can manage are making their biscuits the other groups can be working on their ‘Packaging’ referring to their <i>Final Design</i> from last lesson to complete this.</p> <p>Each child completes their own then they decide as a group which to put forward. When the biscuits and package are ready they should be displayed as a final project</p> <p>Judge as the technical challenge in Bake Off!</p>		



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Unit: Torches		<ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas • Making a torch with a working electrical circuit and switch • Using appropriate equipment to cut and attach materials • Assembling a torch according to the design and success criteria • Evaluating electrical products • Testing and evaluating the success of a final product and taking inspiration from the work of peers • Learning how electrical items work • Identifying electrical products • Learning what electrical conductors and insulators are • Understanding that a battery contains stored electricity and can be used to power products • Identifying the features of a torch • Understanding how a torch works • Articulating the positives and negatives about different torches 	<p>Discuss what electricity is and a potted history. Allow children to make a circuit. Show how to make a simple switch using split pins and a paper clip. Children make their own switch. . Show this electrical hazards website and ask children to identify anything they can see that could be dangerous. Support – some children may need help with their circuit. Challenge – encourage explanations that involve the use of correct vocabulary.</p>	<ul style="list-style-type: none"> • Electric circuit components: batteries, battery holders, wires, bulb/buzzer/motor (one set per table) • Card/cardboard rectangle (one per table) • Recycled materials (eg plastic bottles, packaging cardboards) • Split pins (two per table) • Reflective material eg foil • Scissors • Paper clip (one per table)
		<p>Encourage pupils to explain the purpose and features of a torch. Display this link which shows the different parts of a torch. Show the PowerPoint and identify the components. Evaluate the first torch and annotate. The children follow the same process for the torches on the evaluation sheet. They record their own ideas guided by teacher questioning. Consider what materials will be needed. Complete a class success criteria. Support – focus on similarities and differences in the torches. Challenge – consider a target audience carefully.</p>		
		<p>Display the success criteria from last week. Children should decide what materials they will need and who they will design their torch for. They complete their design sheets. Encourage them to regularly think about who the torch is for. Swap designs with a partner to evaluate. They should be able to answer the following questions: Who are you designing for? What colours did you choose and why? What theme or pattern did you choose and why? Support – suggest materials and ensure the design is simple. Challenge – Add specific factors to satisfy their client’s needs.</p>		



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			<p>Using their design sheets, children collect their materials. They initially make their working circuit. They create the housing. Demonstrate how to cut a hole in plastic. Remind them to find a way to ensure that the circuit doesn't rattle around inside. They test their torches and evaluate them against the design criteria. Allow time to look at each other's' torches and share ideas that they think could have helped improve their own design.</p> <p>Support- some children may benefit from using premade shapes such as bottles or cardboard tubes.</p> <p>Challenge – Add special features to suit their client</p>	
	Unit: Pavilions	<ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weight • Creating a range of different shaped frame structures • Making a variety of free standing frame structures of different shapes and sizes • Selecting appropriate materials to build a strong structure and for the cladding • Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan • Learning to create different textural effects with materials • Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs • Learning what pavilions are and their purpose 	<p>Introduce the concept of a world expo through this video. Show images of several pavilions, eg: exhibition centres in London, the Crystal, the Serpentine Pavilion.</p> <p>Discuss what a pavilion is.</p> <p>Pupils explore making basic geometric structures for strong and stable shapes using tooth picks and sweets/plasticine. They then create larger structures. Allow them to look at each other's work and discuss any difficulties and solutions.</p> <p>Support – provide images for ideas.</p> <p>Challenge – experiment with overhangs.</p>	<ul style="list-style-type: none"> • Lots of toothpicks • Gumdrops or plasticine • A4 stiff card • Pencils • Matchsticks • Lolly sticks • Toothpicks • Straws • Card • Pipe cleaners • Card triangles • Glue guns • Tape • Range of craft materials, e.g. tracing paper, card, sweet wrappers, leaves, crepe paper, fabrics, newspaper, wool, string
			<p>Show examples of pavilions from around the world, including a range of different shapes as well as innovative and functional ideas. Show a copy of the <i>Design Sheet</i> and discuss each point. Particularly discuss the theme. Could be based on ancient Greek pavilions. Children work individually or in pairs to create their designs. Demonstrate how to lightly draw and label a plan on their baseboards to create a footprint.</p> <p>Support – provide visual stimulation</p> <p>Challenge – clearly link with the theme.</p>	



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		<ul style="list-style-type: none">• Building on prior knowledge of net structures and broadening knowledge of frame structures• Learning that architects consider light, shadow and patterns when designing• Implementing frame and shell structure knowledge• Considering effective and ineffective designs	<p>Demonstrate how to recreate the structures that the children built in the first lesson, but this time using permanent construction techniques. Children build their structure with reference to the success criteria and design sheets.</p> <p>Support- reminders to stick to the design.</p> <p>Challenge – Experiment with using more sophisticated construction techniques.</p>	<ul style="list-style-type: none">• Optional: for an extended project, papier mache could be used for cladding
			<p>Give each pupil a small sheet of paper and ask half the class to scrunch it up as tight as they can and the other half to create a zig-zag through folds and creases. Ask all pupils to open the sheets and flatten them out so they can see the different textured effects they have created. Discuss different cladding possibilities and how to attach them (see video).</p> <p>Children create their cladding.</p> <p>Arrange finished work as a “class expo” and review the creations.</p> <p>Support – just use paper and experiment with texture by foding or scrunching.</p> <p>Challenge - create a landscape to give context to their pavilion.</p>	



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	Unit: Fastenings	<ul style="list-style-type: none"> • Writing design criteria for a product, articulating decisions made • Designing a personalised Book sleeve • Making and testing a paper template with accuracy and in keeping with the design criteria • Measuring, marking and cutting fabric using a paper template • Selecting a stitch style to join fabric, working neatly sewing small neat stitches • Incorporating fastening to a design • Testing and evaluating an end product against the original design criteria • Deciding how many of the criteria should be met for the product to be considered successful • Suggesting modifications for improvement • Understanding that there are different types of fastenings and what they are • Articulating the benefits and disadvantages of different fastening types 	<p>Send children on a scavenger hunt to find as many different ways that fabric is fastened together as they can. Using the images ask the children to annotate each one to list the types of things this type of fastening is used for (eg: poppers - coats, shirts, bedding, bags, purses). Consider how it would be attached to fabric. Using the chart, consider the advantages and disadvantages for each fastening type (you may need to suggest the concept of cost - toggles and zippers being the more expensive). Question the children on whether they consider fastening when they buy something. Support – word mat available Challenge – consider production issues</p> <hr/> <p>Explain that we will be designing a book cover for the Spiderwick Chronicles, which includes a fastening. Show a range of images. Consider what they would like to include in their design. Mind map this information. Hand out the design sheet for children to complete. Demonstrate how to fold paper as a sleeve. Children design their sleeve. They need measurements, colours and decorations as well as details of how they will join (glue, sewing applique). It must clearly show the type of fastening to be used. Share ideas with partner. Show the <i>Book Sleeve Example</i>, discussing how it matches the design criteria and how they would make this particular book sleeve. Support – may need help with folding Challenge – Could make their own templates</p> <p>The decoration should include some simple shapes that are sewn together to make a collage.</p>	<ul style="list-style-type: none"> • Felt • Pins • Scissors • Thread/embroidery thread • Needles, with large heads • Optional: needle threaders
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			<p>Look at design sheets to consider how many sections are needed, what size and shape they should be and how they will be joined. Cut out paper templates and join with pins. They put their book inside o check it. Pin it to the fabric and cut out.</p> <p>Explain to each other how they will make their cover. Record on their action plan.</p> <p>Support – templates available</p> <p>Challenge – attempt a more complicated style</p>	
			<p>Children check their action plan. Sew the pieces together. Once they are assembled they should be decorated as per the design criteria. Share the finished products. Demonstrate that they work. Decide together how many aspects of the design criteria need to be met in order to be considered successful.</p> <p>Support – cut one large piece of fabric to reduce sewing.</p> <p>Challenge – Use small neat stitches. Consider any areas that will to be reinforced.</p>	



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		<u>Intent</u> Objectives; Skills; Knowledge	<u>Implementation</u> Teaching; Activities	Resources
Year 5	Unit: What could be healthier?	<ul style="list-style-type: none">• Cutting and preparing vegetables safely• Using equipment safely, including knives, hot pans and hobs• Knowing how to avoid cross contamination• Following a step by step method carefully to make a recipe• Identifying the nutritional differences between different products and recipes• Identifying and describing healthy benefits of food groups• Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed• Understanding what constitutes a balanced diet• Learning to adapt a recipe to make it healthier• Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option		<ul style="list-style-type: none">• Whiteboards and pens• Two different Bolognese sauces for the children to taste• Cooker hob• Chopping boards• Peelers• Knives• Pans• Wooden spoons• Graters• Garlic crushers• A collection of supermarket Bolognese sauce packaging (low and high priced)• Empty, clean jars• Optional: enough computers per group or paper and pens



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Unit: Automata Toys	<ul style="list-style-type: none"> • After experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors • Assembling components accurately to make a stable frame • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set • Evaluating the work of others and receiving feedback on own work • Applying points of improvements • Describing changes they would make/ do if they were to do the project again • Using a bench hook to saw safely and effectively • Exploring cams, learning that different shaped cams produce different follower movements • Exploring types of motions and direction of a motion 		<ul style="list-style-type: none"> • Hand drills • 3mm and 4mm drill bits • Tenon saws • Bench hooks • Jelutong • Dowel rod • Thin card • Scissors • Rulers • Pencils • Craft knives • Glue guns/ PVA glue • Corrugated card • Scrap card • A4/A3 card • Masking tape • Magazines and newspapers • Engineers squares if possible otherwise set squares
	<ul style="list-style-type: none"> • Designing a stuffed toy considering the main component shapes required and creating an appropriate template • Considering proportions of individual components • Creating a 3D stuffed toy from a 2D design • Measuring, marking and cutting fabric accurately and independently • Creating strong and secure blanket stitches when joining fabric • Using applique to attach pieces of fabric decoration • Testing and evaluating an end product and giving point for further improvements • Learning to sew blanket stitch to join fabric • Applying blanket stitch so the space between the stitches are even and regular • Threading needles independently 		<ul style="list-style-type: none"> • A4 paper per pupil • Fabric in different colours • Pins • Scissors • Scraps of fabric • Thread • Needles • Fabric • Post-it notes • Optional: Needle threaders



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	Unit: Greeting Card	<ul style="list-style-type: none">• Designing an electronic greetings card with a simple electrical control circuit• Creating a labelled design showing positive and negative parts in relation to the LED and the battery• Making a working circuit• Creating an electronics greeting card, referring to a design criteria• Mapping out where different components of the circuit will go• Evaluating a completed product against the original design sheet and looking at modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of electronic device, eg: buzzer• Learning the key components used to create a functioning circuit• Learning that graphite is a conductor and can be used as part of a circuit• Learning the difference between series and parallel circuits• Understanding that breaks in a circuit will stop it from working		<ul style="list-style-type: none">• 9v battery (per pair of pupils)• Wire• Crocodile clips• HB pencil• Pencil sharpener• Insulation tape• LEDs or science light bulbs (per pupil)• Paper• Graphite/art pencil (per pair of pupils)• Foil• Sellotape• Scissors• A4 card approx. 70 sheets• Coloured pencils/pens• Glue sticks• Materials for decorating the cards, eg: tissue paper, foil, glitter etc.• Sticky copper tape (about 40cm per pupil)• 3v coin cell batteries (one per pupil)• Pliers (one pair per three or four pupils)• Binder/bulldog clips (one per pupil)
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	Unit: Bridges	<ul style="list-style-type: none">• Designing a stable structure that is able to support weight• Creating frame structure with focus on triangulation• Making a range of different shaped beam bridges• Using triangles to create truss bridges that span a given distance and supports a load• Building a wooden bridge structure• Independently measuring and marking wood accurately• Selecting appropriate tools and equipment for particular tasks • Using the correct techniques to saws safely• Identifying where a structure needs reinforcement and using card corners for support• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary• Suggesting points for improvements for own bridges and those designed by others• Exploring how to create a strong beam• Identifying arch and beam bridges and understanding the terms: compression and tension• Identifying stronger and weaker structures• Finding different ways to reinforce structures• Understanding how triangles can be used to reinforce bridges • Articulating the difference between beam, arch, truss and suspension bridges		<ul style="list-style-type: none">• Spaghetti• Masking tape• Glue gun• Weights• Classroom chairs• Ruler• Jelutong or Balsa wood (10x10mm or 5x5mm)• Lolly sticks or match sticks• Card• Rulers• Pencils• Scissors• Saws (preferably tenon saws and bench hooks)• Files (helpful, not essential)• PVA glue or glue guns
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		<u>Intent</u> Objectives; Skills; Knowledge	<u>Implementation</u> Teaching; Activities	Resources
Year 6	Unit: Come Dine With Me.	<ul style="list-style-type: none">• Writing a recipe, explaining the key steps, method and ingredients• Including facts and drawings from research undertaken• Following a recipe, including using the correct quantities of each ingredient• Adapting a recipe based on research• Working to a given timescale• Working safely and hygienically with independence• Evaluating a recipe, considering: taste, smell, texture and origin of the food group• Taste testing and scoring final products• Suggesting and writing up points of improvements in productions• Evaluating health and safety in production to minimise cross contamination• Learning how to research a recipe by ingredient• Recording the relevant ingredients and equipment needed for a recipe• Understanding the combinations of food that will complement one another• Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient		<ul style="list-style-type: none">• Paper and pencils• A variety of cookbooks• Pens• Scrap paper• Plain paper• Peppers• Salmon fillets• Cooking equipment linked to individual children's recipes• Fresh pineapples



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	Unit: Pop up Book	<ul style="list-style-type: none"> • Designing a popup book which uses a mixture of structures and mechanisms • Naming each mechanism, input and output accurately • Storyboarding ideas for a book • Following a design brief to make a pop up book, neatly and with focus on accuracy • Making mechanisms and/ or structures using sliders, pivots and folds to produce movement • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result • Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement • Knowing that an input is the motion used to start a mechanism • Knowing that output is the motion that happens as a result of starting the input • Knowing that mechanisms control movement • Describing mechanisms that can be used to change one kind of motion into another 		<ul style="list-style-type: none"> • A selection of pop-up books/ greetings cards • A disassembled greeting card mechanism • Drawing and colouring pencils • A3 card • Scrap card • Thick corrugated card • Scrap coloured paper/card • Scissors • Glue sticks • Paper fasteners/ split pins • Hole puncher • Rulers • Optional: foil, crepe paper, googly eyes, pipe cleaners, felt
	Unit: Waistcoats	<ul style="list-style-type: none"> • Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs <p>Using template pinning panels onto fabric</p> <ul style="list-style-type: none"> • Marking and cutting fabric accurately, in accordance with a design • Sewing a strong running stitch, making small, neat stitches and following the edge • Tying strong knots • Decorating a waistcoat - attaching objects using thread and adding a secure fastening • Evaluating work continually as it is created • Learning different decorative stitches • Application and outcome of the individual technique • Sewing accurately with even regularity of stiches 		<ul style="list-style-type: none"> • Cheap fabric (enough for the class to make a waistcoat each) • Chalk • A selection of threads and fabric • Scissors • Needles • Pins • A selection of buttons, beads, etc.



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	Unit: Steady Hand Game	<ul style="list-style-type: none">• Designing a steady hand game - identifying and naming the components required• Drawing a design from three different perspectives• Generating ideas through sketching and discussion• Modelling ideas through prototypes• Making electromagnetic motors and tweaking the motor to improve its function• Constructing a stable base for an electromagnetic game• Accurately cutting, folding and assembling a net• Decorating the base of the game to a high quality finish• Making and testing a circuit• Incorporating a circuit into a base• Testing own and others finished games, identifying what went well and making suggestions for improvement• Understanding how electromagnetic motors work• Learning that batteries contain acid, which can be dangerous if they leak• Learning that when electricity enters a magnetic field it can make a motor		<ul style="list-style-type: none">• Copper craft wire• 8mm diameter x 1mm thick neodymium disc magnets (three per pair of pupils)• AA batteries (one per pair of pupils)• Pliers (per pair of pupils)• Colouring pens/pencils• Colouring pens and pencils• Black fine liners/markers• Scissors• Glue sticks• Set squares and rulers (for pupils working at greater depth)• Electrical wires - preferably with crocodile clips (four per pupil)• Buzzer or bulb and bulb holder (per pupil)• Battery pack (per pupil)• AA batteries (two per pupil)• Tinned copper wire (50cm per pupil)• Wire cutters• Pliers• Switch• Scissors
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Unit: Playgrounds	<ul style="list-style-type: none">• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs• Building a range of play apparatus structures drawing upon new and prior knowledge of structures• Measuring, marking and cutting wood to create a range of structures• Using a range of materials to reinforce and add decoration to structures• Improving a design plan based on peer evaluation• Testing and adapting a design to improve it as it is developed• Identifying what makes a successful structure• Knowing that structures can be strengthened by manipulating materials and shapes• Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans)• Understanding man-made and natural structures	<ul style="list-style-type: none">• Plain paper• Pencils• Rubbers• Sharpeners• A3 card• A3 card bases• Pencils• Rubbers• Rulers• 10x10 or 5x5 jelutong and/or dowel• Lolly sticks or toothpicks• Tenon saws and bench hooks or coping saws and vices• Card• Scissors• Glue guns and/or PVA• Straws• Pipe cleaners• Range of cladding materials: tracing paper, elastic bands, plastic bags, packaging, newspaper, string/wool, leaves, etc• Felt tips• Paint• Coloured paper• Natural materials, eg: twigs, leaves, stones, tree bark, etc• Playdough or plasticine• Sand• Foil
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