DESIGN AND TECHNOLOGY OVERVIEW KNOWLEDGE, SKILLS & VOCAB

Year & Topic	National Curriculum Objectives	Concept	Key Skills	Subject and Specific Knowledge	Vocabulary
Y1 A Toy's Story Wheels and Axles Focus: Evaluate	**Design** Design purposeful, functional, appealing products for themselves and other users based on design criteria **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	**Innovation** **Inspiration** **Practical Knowledge** **Functionality** **Innovation**	**Designing** • Draw on their own experience to help generate ideas. • Suggest ideas and explain what they are going to do. • Identify a target group for what they intend to design and make. • Model their ideas in card and paper. • Develop their design ideas applying findings from their earlier research.	• Discuss with the children what they will be designing, making and evaluating within an authentic context. • With the children identify a user and purpose for the product and generate simple criteria. • Ask children to generate, develop and communicate their ideas as appropriate e.g. through talk and drawing. Talk about, evaluate and share ideas with other children/adults. • Using construction kits with wheels and axles, ask children to make a product that moves. • Demonstrate to children how wheels and axles may be assembled as either fixed axles or free axles. • Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders. • Ensure that children are taught how to mark out, hold, cut and join materials and components correctly. • Using samples of materials and components they will use when designing and making, ask the children to assemble some examples of wheel, axle, axle holder combinations. Display the work completed as a reference for their DMEA. • Discuss how the children might add finishing techniques to their product with reference to their design ideas and criteria.	vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used design, make, evaluate, purpose,

	Evaluate Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	**Practical Knowledge** **Aesthetics** **Evaluate**	**Making** • Make their design using appropriate techniques. • With help measure, mark out, cut and shape a range of materials. • Use tools e.g. scissors and a hole punch safely. • Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape. • Use simple finishing techniques to improve the appearance of their product. **Evaluating** • Evaluate their product by discussing how well it works in relation to the purpose. • Evaluate their products as they are developed, identifying strengths and possible changes they might make. • Evaluate their product by answering questions about what they have made and how they have gone about it.	• Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made.	user, criteria, functional

Y1 Hot and Cold Places Preparing Fruit and Vegetables Focus: 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 **Make** Select from and use a range of tools and equipment to perform practical tasks. Use a wide range of materials and components, including construction materials, textiles and	**Design** **Nutrition** **Inspiration** **Innovation** **Practical Knowledge** **Evaluate**	**Designing** • Draw on their own experience to help generate ideas. • Suggest ideas and explain what they are going to do. • Identify a target group for what they intend to design and make. • Develop their design ideas applying findings from their earlier research. **Making** • Make their design using appropriate techniques. • Use tools eg knives safely using appropriate techniques. • Select and use appropriate fruit and vegetables, processes and tools. • Use basic food handling, hygienic practices and personal hygiene. **Evaluating** • Evaluate their products as they are developed, identifying strengths and possible changes they might make.	• Set a context for designing and making which is authentic and meaningful. • Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. • Agree on design criteria that can be used to guide the development and evaluation of children's products. • Children examine a range of fruit/vegetables. Use questions to develop children's understanding e.g. *What is this called? Who has eaten this fruit/vegetable before?* • Provide opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. • Evaluate existing products to determine what the children like best; provide opportunities for the children to investigate preferences of their intended users/suitability for intended purposes. • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk. • Demonstrate how to use simple utensils and provide opportunities for the children to practise food-processing skills such as washing, grating, peeling, slicing, squeezing. • Discuss healthy eating advice, including eating more fruit and vegetables; using *The eatwell plate* model talk about the importance of fruit and vegetables in our balanced diet. • Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product? • Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs. • Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	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

	ingredients, according to their characteristics				
Y1 By the Seaside Textiles – Template and Joining Techniques. Focus: Make	Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to	**Design** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge** **Functionality** **Evaluate**	**Designing** • Draw on their own experience to help generate ideas. • Suggest ideas and explain what they are going to do. • Identify a target group for what they intend to design and make. • Model their ideas in card and paper. **Making** • Make their design using appropriate techniques. • With help measure, mark out, cut and shape a range of materials. • Use tools eg scissors safely. • Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape. • Use simple finishing techniques to improve the appearance of their product. **Evaluating** • Evaluate their products as they are developed, identifying strengths and possible changes they might make.	• Provide the children with a context that is authentic. Discuss with children the purpose and user of the products they will be designing, making and evaluating. Design criteria developed with the teacher should be used to guide the development and evaluation of the children's products. • Ask the children to generate a range of ideas e.g. *What parts will the product need to have and what will it be made from? What size will it be? How will it be joined and finished?* • Through talk, drawings and mock-ups, ask the children to develop and communicate their ideas. Information and communication technology could be used for symmetry and pattern ideas. Choose one idea to follow through. • Talk with the children about the stages in making before assembling quality products, applying the knowledge, understanding and skills learnt through the IEAs and FTs. • Children investigate and evaluate existing products linked to the chosen project. Explore and compare e.g. fabrics, joining techniques, finishing techniques and fastenings used. • Use questions to develop children's understanding e.g. *How many parts is it made from? What is it joined with? How is it finished? Why do you think these joining techniques have been chosen? How is it fastened? Who might use it and why?* • Make drawings of existing products, stating the user and purpose. Identify and label, if appropriate, the fabrics, fastenings and techniques used. • Investigate fabrics to determine which is best for the purpose of the product they are creating. • Using prepared teaching aids, demonstrate the use of a template or simple paper pattern. Children could make their own templates or paper patterns. If necessary, they can use ones provided by the teacher. • Using prepared teaching aids, demonstrate the correct use of appropriate tools to mark out, tape or pin the	names of existing products, joining and finishing techniques, tools, fabrics and components template, pattern pieces, mark out, join, decorate, finish features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function

	their characteristics Evaluate their ideas and products against design criteria			fabric to the templates or paper patterns and cut out the relevant fabric pieces for the product. • Using prepared teaching aids, demonstrate appropriate examples of joining techniques for children to practise in guided groups e.g. running stitch including threading own needle, stapling, lacing and gluing. Talk about the advantages and disadvantages of each technique. • Using prepared teaching aids, demonstrate examples of finishing techniques for children to practise in guided groups e.g. sewing buttons, 3-D fabric paint, gluing sequins, printing. • Evaluate ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	
Y2 Four Nations Preparing Fruit and Vegetables Focus: Make	Design purposeful, functional, appealing products for themselves and other users based on design criteria Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of materials and components,	**Design** **Nutrition** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge**	**Designing** • Generate ideas by drawing on their own, and other people's, experiences. • Develop their design ideas through discussion, observation, drawing and modelling. **Making** • Make their design using appropriate techniques. • With help measure, mark out, cut and shape a range of materials. • Use tools eg knives safely using appropriate techniques. • Select and use appropriate fruit and vegetables, processes and tools.	• Set a context for designing and making which is authentic and meaningful. • Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. • Agree on design criteria that can be used to guide the development and evaluation of children's products. • Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product? • Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs. • Children examine a range of fruit/vegetables. Use questions to develop children's understanding e.g. *What is this called? Who has eaten this fruit/vegetable before?* • Provide opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. • Evaluate existing products to determine what the children like best; provide opportunities for the children to investigate preferences of their intended users/suitability for intended purposes.	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,

	including construction materials, textiles and ingredients, according to their characteristics	**Aesthetics** **Evaluate**	• Use basic food handling, hygienic practices and personal hygiene. **Evaluating** • Talk about their ideas, saying what they like and dislike about them.	• Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk. • Demonstrate how to use simple utensils and provide opportunities for the children to practise food-processing skills such as washing, grating, peeling, slicing, squeezing. • Discuss healthy eating advice, including eating more fruit and vegetables; using *The eatwell plate* model talk about the importance of fruit and vegetables in our balanced diet. • Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	investigating tasting, arranging, popular, design, evaluate, criteria
Y2 London's Burning Free Standing Structures Focus: Evaluate	**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	**Design** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge**	**Designing** • Generate ideas by drawing on their own, and other people's, experiences. • Develop their design ideas through discussion, observation, drawing and modelling. • Identify a purpose for what they intend to design and make • Identify simple design criteria. • Make simple drawings and label parts. **Making** • Begin to select tools and materials; use vocab' to name and describe them. • Measure, cut and score with some accuracy. • Use hand tools safely and appropriately. Assemble,	• Go on a walk and/or look at photographs of the local area to explore structures such as playground equipment, street furniture, walls, towers and bridges e.g. *What are the structures called and what is their purpose? Who might use them? What materials have been used? Why have these been chosen? How have the parts been joined together? How have the structures been made strong enough? How have they been made stable?* • Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes e.g. wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube. • Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials that children are likely to use to make their structures. Discuss the suitability of materials for their products according to their characteristics. • Ask the children to build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks e.g. *How can you stop your*	cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder design, make, evaluate, user, purpose, ideas,

	technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	**Functionality** **Evaluate**	join and combine materials in order to make a product. **Evaluating** • Evaluate against their design criteria. • Evaluate their products as they are developed, identifying strengths and possible changes they might make. • Talk about their ideas, saying what they like and dislike about them.	*structures from falling over? How they can be made stronger and stiffer in order to carry a load?* Children could make models of the structures they have seen in school and the local area. • Ask children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. Encourage them to think about how folding materials can make them stronger, stiffer, stand up and be more stable e.g. *Can they support an object on top of their structures without it falling over or breaking?* • Discuss with the children what structure they will be designing, making and evaluating e.g. *Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable?* • Generate some simple design criteria with the children e.g. the structure should stand up on its own, it should be strong enough to carry Teddy. • Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with construction kits and other materials. • As a whole class, plan the order in which the structures will be made. Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics. • Ask children to evaluate their developing ideas and final products against original design criteria.	design criteria, product, function
Y2	**Design** Design purposeful,	**Design**	**Designing** • Generate ideas by drawing on their own, and	• Children explore and evaluate a collection of books and everyday products that have moving parts, including	slider, lever, pivot, slot, bridge/guide

Up, Up and Away **Mechanisms: Sliders and Levers** **Focus: Design**	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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of materials and components,	**Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge** **Functionality** **Aesthetics** **Evaluate**	other people's, experiences. • Develop their design ideas through discussion, observation, drawing and modelling. • Identify a purpose for what they intend to design and make • Identify simple design criteria. • Make simple drawings and label parts. **Making** • Begin to select tools and materials; use vocab' to name and describe them. • Measure, cut and score with some accuracy. • Use hand tools safely and appropriately. Assemble, join and combine materials in order to make a product. • Choose and use appropriate finishing techniques. **Evaluating** • Evaluate against their design criteria. • Evaluate their products as they are developed, identifying strengths and possible changes they might make.	those with levers and sliders. e.g. *What is it? Who is it for? What is it for?* • Use questions to develop children's understanding e.g. *What do you think will move? How will you make it move? What part of the product moved and how did it move? How do you think the mechanism works? What else could move in the product? How well does it work?* • Introduce and develop vocabulary e.g. lever, pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out. • Discuss with the children what they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? How do you want it to move? Will you use a lever or a slider? • Demonstrate simple levers and sliders to the children using prepared teaching aids. It is helpful if these are also used in context e.g. the slider is used to show a snail appearing from behind a stone, the lever is used to show a butterfly flying to a flower. • Use questions to develop children's understanding e.g. How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the slider and lever remind you of? • Generate simple design criteria with the children e.g. the mechanism should work smoothly, it should make the right type of movement. • Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with paper and card. • Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by replicating the slider and lever teaching aids. Encourage children to add pictures to their mechanisms. • Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, felt tipped pens or collage. • As a whole class, talk about the order in which the mechanisms will be made. • Ask children to evaluate their developing ideas and final products against the original design criteria.	card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards design, make, evaluate, user, purpose, ideas, design criteria, product, function

	including construction materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria				
Y3 Through the ages Healthy and Varied Diet Focus: Design	**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,	**Design** **Nutrition** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge**	**Designing** • Generate ideas for an item, considering its purpose and the user/s. • Identify a purpose and establish criteria for a successful product. • Plan the order of their work before starting • Explore, develop and communicate design proposals by modelling ideas. • Make drawings with labels when designing. **Making** • Select tools and techniques for making their product. • Work safely and accurately with a range of simple tools.	• Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. *What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat?* • Ask children to generate a range of ideas encouraging realistic responses. • Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas. • Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need. • Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using *The eatwell plate* e.g. *What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre?*	name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet

	information and communication technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	**Functionality** **Evaluate**	• Think about their ideas as they make progress and be willing change things if this helps them improve their work. • Demonstrate hygienic food preparation and storage. **Evaluating** • Evaluate their product against original design criteria e.g. how well it meets its intended purpose.	• Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. *How do the sensory characteristics affect your liking for the food?* • Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet. • Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. *Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?* • Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking. • Food preparation and cooking techniques could be practised by making a food product using an existing recipe. • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. *What should we do before we work with food? Why is following instructions important?* • Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved.	planning, design criteria, purpose, user, annotated sketch, sensory evaluations

Y3 The Steel City Shell Structures Focus: Evaluate	**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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of	**Design** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge** **Evaluate** **Aesthetics** **Functionality** **Evaluate**	**Designing** • Generate ideas for an item, considering its purpose and the user/s. • Identify a purpose and establish criteria for a successful product. • Explore, develop and communicate design proposals by modelling ideas. • Make drawings with labels when designing. **Making** • Select tools and techniques for making their product. • Measure, mark out, cut, score and assemble components with more accuracy. • Work safely and accurately with a range of simple tools. • Think about their ideas as they make progress and be willing change things if this helps them improve their work. • Use finishing techniques strengthen and improve the appearance of their product using a range of equipment including ICT. **Evaluating** • Evaluate their product against original design criteria e.g. how well it meets its intended purpose. • Disassemble and evaluate familiar products.	• Develop a design brief with the children within a context which is authentic and meaningful. • Discuss the uses and purposes of their shell structure e.g. What does the product need to do? Who is it aimed at? How will the purpose and user affect your design decisions? Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. How will we know that we have designed and made successful products? • Children investigate a collection of different shell structures including packaging. Use questions to develop children's understanding e.g. *What is the purpose of the shell structure – protecting, containing, presenting? What material is it made from? How has it been constructed? Are the materials recyclable or reusable? How has it been stiffened i.e. folded, corrugated, ribbed, laminated? What size/shape/colour is it? What information does it show and why? How attractive is the design?* • Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling pre-drawn nets in numerous ways using scoring, cutting and assembling techniques. Allow children to construct a simple box and show how a window can be cut out and acetate sheet added. • Children take a small package apart identifying and discussing parts of a net including the tabs e.g. *How are different faces of the package arranged? How are the tabs used to join the 'free' edges of the net?* • Evaluate existing products to determine which designs children think are the most effective. Provide opportunities for the children to judge the suitability of the shell structures for their intended users and purposes. Discuss graphics including colours/impact of style/logo/size of font e.g. *What do you prefer and why? What style of graphics and lettering might we want to include in our product to meet users' preferences and its intended purpose? Which packaging might be the best for…?* • Demonstrate simple drawing software such as Techsoft 2D Primary or Microsoft Word. Ask children to explore the interface and drawing tools to practise drawing and manipulating shapes such as rectangles, squares, ellipses, trapezoids and triangles.	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, 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

	materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			• Ask children to use the software to open existing drawings including nets and to draw nets of their own, using gridlines and pre-shaped tools. • Let the children explore and be guided to try out different fill and font tools to become familiar with the graphic design aspects of the available software to achieve the desired appearance of their products. • Ask the children to develop a design using computer-aided design (CAD) software to create nets, addressing the needs of the user and the purpose. • Using computer-aided design (CAD) software ask the children to print out their nets to develop prototypes in order to evaluate and refine their ideas e.g. *What will you need to include in your design? How can you improve it? What materials will you use? How will you make sure your product works well and has the right appearance?* • Ask children to identify the main stages of making and the appropriate tools and skills they learnt through focused tasks. Encourage the children to work with accuracy, using their computer-aided design (CAD) skills as appropriate. • Evaluate throughout and the final products against the intended purpose and with the intended user, where safe and practical, drawing on the design criteria previously agreed.	
Y3 Its all Greek to me Mechanisms – Levers and Linkages. Focus: Make	**Design** Design purposeful, functional, appealing products for themselves and other users based on design criteria Generate, develop, model and communicate their ideas	**Design** **Inspiration** **Innovation** **Technical Knowledge**	**Designing** • Generate ideas for an item, considering its purpose and the user/s. • Identify a purpose and establish criteria for a successful product. • Explore, develop and communicate design proposals by modelling ideas. • Make drawings with labels when designing.	• Children investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms. • Use questions to develop children's understanding e.g. *Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move? How do you think the mechanism works? What materials have been used? How effective do you think it is and why? What else could move?* • Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids. • Use questions to develop children's understanding e.g. *Which card strip is the lever? Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots?*	mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function

	through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products	**Practical Knowledge** **Evaluate** **Aesthetics** **Functionality** **Evaluate**	**Making** • Select tools and techniques for making their product. • Measure, mark out, cut, score and assemble components with more accuracy. • Work safely and accurately with a range of simple tools. • Think about their ideas as they make progress and be willing change things if this helps them improve their work. • Use finishing techniques strengthen and improve the appearance of their product using a range of equipment including ICT. **Evaluating** • Evaluate their product against original design criteria e.g. how well it meets its intended purpose.	• Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques. • Children should develop their knowledge and skills by replicating one or more of the teaching aids. • Develop a design brief with the children within a context which is authentic and meaningful. • Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products. • Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas. • Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs. • Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	prototype, design criteria, innovative, appealing, design brief

	Evaluate their ideas and products against design criteria				
Year 4 Travel and Transport Electrical Systems Focus: Make	**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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping,	**Design** **Inspiration** **Technical Knowledge** **Practical Knowledge** **Practical Knowledge** **Functionality** **Evaluate**	**Designing** • Generate ideas, considering the purposes for which they are designing. • Make labelled drawings from different views showing specific features. • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail. **Making** • Select appropriate tools and techniques for making their product. • Join and combine materials and components accurately in temporary and permanent ways. • Use simple graphical communication techniques. **Evaluating** • Evaluate their products carrying out appropriate tests.	• Discuss, investigate and, where practical, disassemble different examples of relevant battery-powered products, including those which are commercially available e.g. *Where and why they are used? How does the product work? What are its key features and components? How does the switch work? Is the product manually controlled or controlled by a computer? What materials have been used and why? How is it suited to its intended user and purpose?* • Ask children to investigate examples of switches, including those which are commercially available, which work in different ways e.g. push-to-make, push-to-break, toggle switch. Let the children use them in simple circuits e.g. *How might different types of switches be useful in different types of products?* • Remind children about the dangers of mains electricity. • Recap with the children how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers. Discuss which of the components in the circuit are input devices e.g. switches, and which are output devices e.g. bulbs and buzzers. • Demonstrate how to find a fault in a simple circuit and correct it, giving pupils opportunities to practise. • Use a simple computer control program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers. • Ask the children to make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips. Encourage children to make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side. Ask the children to test their switches in a simple series circuit. • Teach children how to avoid making short circuits. • Develop a design brief with the children within a context which is authentic and meaningful. • Discuss with children the purpose of the battery-powered products that they will be designing and making and who	series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device user, purpose, function, prototype, design criteria, innovative, appealing, design brief

	joining and finishing] Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			they will be for. Ask the children to generate a range of ideas, encouraging realistic responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products, including safety features. • Using annotated sketches, cross-sectional and exploded diagrams, as appropriate, ask the children to develop, model and communicate their ideas. • Ask the children to consider the main stages in making and testing before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs. • Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	
Year 4 Natural Disasters Textiles: 2D to 3D Products Focus: Design	**Design** Design purposeful, functional, appealing products for themselves and other users based on design criteria Generate, develop, model and	**Design** **Inspiration** **Technical Knowledge** **Practical Knowledge**	**Designing** • Generate ideas, considering the purposes for which they are designing. • Make labelled drawings from different views showing specific features. • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative	• Children investigate a range of textile products that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate. Think about products from the past and what changes have been made in textile production and products e.g. the invention of zips and Velcro. • Give children the opportunity to disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances. • Use questioning to develop understanding e.g. *What is its purpose? Which one is most suited to its purpose? What properties/characteristics does the fabric have? Why has this fabric been chosen? How has the fabric been joined together? How effective are its fastenings? How has it been decorated? Does its decoration have a*	fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance

	communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range	**Evaluate** **Practical Knowledge** **Aesthetics** **Functionality** **Evaluate**	methods of making, if the first attempts fail. • Evaluate products and identify criteria that can be used for their own designs. **Making** • Select appropriate tools and techniques for making their product. • Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. • Join and combine materials and components accurately in temporary and permanent ways. • Sew using a range of different stitches, weave and knit. • Measure, tape or pin, cut and join fabric with some accuracy. **Evaluating** • Evaluate their work both during and at the end of the assignment.	*purpose? What would the 2-D pattern piece look like? What are its measurements? How might you change the product?* • Demonstrate a range of stitching techniques and allow children to practise sewing two small pieces of fabric together, demonstrating the use of, and need for, seam allowances. • Allow children to use a textile product they have taken apart to create a paper pattern using 2-D shapes. • Provide a range of fabrics – children to consider whether fabrics are suitable for the chosen purpose and user. The fabrics also can be used for demonstrating and testing out a range of decorative finishing techniques e.g. appliqué, embroidery, fabric pens/paints, printing. • Use questioning to develop understanding e.g. *Which joining technique makes the strongest seam? Why? Which stitch is appropriate for the purpose? Which joining techniques are suitable for the fabric and purpose? How can you stiffen your fabric? What is the purpose of the fastenings? Which one is most suited to the purpose and user? What decorative techniques have been used? What effect do they have?* • Children to create a design brief, supported by the teacher, set within a context which is authentic and meaningful. Discuss the intended user, purpose and appeal of their product. Create a set of design criteria. • Ask children to sketch and annotate a range of possible ideas, constantly encouraging creative thinking. Produce mock-ups and prototypes of their chosen product. • Plan the main stages of making e.g. using a flowchart or storyboard. • Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs. Encourage children to think about the aesthetics and quality finish of their product. • Evaluate as the process is undertaken and the final product in relation to the design brief and criteria. The product should be tested by the intended user and for its purpose and others' views sought to help with identifying possible improvements.	user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces

	of existing products Evaluate their ideas and products against design criteria				
Y4 Invaders and Settlers: Vikings Healthy and Varies Diet Focus: Evaluate	**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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for	**Design** **Nutrition** **Inspiration** **Technical Knowledge** **Evaluate** **Practical Knowledge** **Aesthetics** **Evaluate**	**Designing** • Generate ideas, considering the purposes for which they are designing. • Make labelled drawings from different views showing specific features. • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail. • Evaluate products and identify criteria that can be used for their own designs. **Making** • Select appropriate tools and techniques for making their product. • Use simple graphical communication techniques. **Evaluating** • Evaluate their work both during and at the end of the assignment.	• Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using *The eatwell plate* e.g. *What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre?* • Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. *How do the sensory characteristics affect your liking for the food?* • Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet. • Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. *Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?* • Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking. • Food preparation and cooking techniques could be practised by making a food product using an existing recipe. • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. *What should we do before we work with food? Why is following instructions important?*	name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet planning, design criteria, purpose, user, annotated sketch, sensory evaluations

	example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			• Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. *What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat?* • Ask children to generate a range of ideas encouraging realistic responses. • Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas. • Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need. • Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved.	
Y5 The Tudors Food: Celebrating culture and seasonality Focus: Evaluate	**Design** Design purposeful, functional, appealing products for themselves and other users based on design criteria	**Design** **Nutrition** **Inspiration** **Data** **Practical Knowledge**	**Designing** • Generate ideas through brainstorming and identify a purpose for their product. • Draw up a specification for their design • Use results of investigations, information sources, including ICT when developing design ideas.	• Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. *What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?* • Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could	ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy,

	Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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	**Practical Knowledge** **Aesthetics** **Evaluate**	**Making** • Select appropriate materials, tools and techniques. • Use skills in using different tools and equipment safely and accurately. • Weigh and measure accurately (time, dry ingredients, liquids). • Apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens. **Evaluating** • Evaluate a product against the original design specification. • Evaluate it personally and seek evaluation from others.	be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing. • Use a range of questions to support children's ability to evaluate food ingredients and products e.g. *What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?* • Research key chefs and how they have promoted seasonality, local produce and healthy eating. • Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients. • Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically. • Techniques could be practised following a basic recipe to prepare and cook a savoury food product. • Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell. • When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. *Which shape is most appealing and why?* • Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating. • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product. • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas. • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.	allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble design specification, innovative, research, evaluate, design brief

	Evaluate Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			• Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.	
Y5 Rainforests Textiles: Combining different fabric shapes Focus: Design	**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 **Make** Select from and use a range of tools and equipment to	**Design** **Inspiration** **Innovation** **Data** **Technical Knowledge** **Practical Knowledge**	**Designing** • Generate ideas through brainstorming and identify a purpose for their product. • Draw up a specification for their design • Use results of investigations, information sources, including ICT when developing design ideas. **Making** • Select appropriate materials, tools and techniques. • Measure and mark out accurately. • Use skills in using different tools and equipment safely and accurately. • Cut and join with accuracy to ensure a good-quality finish to the product. • Pin, sew and stitch materials together to make a product. **Evaluating**	• Children investigate, analyse and evaluate a range of existing products which have been produced by combining fabric shapes. Investigate work by designers and their impact on fabrics and products. Use questions to develop children's understanding e.g. *Is the product functional or decorative? Who would use this product? What is its purpose? What design decisions have been made? Do the textiles used match the intended purpose? What components have been used to enhance the appearance? To what extent is the design innovative?* • Children investigate and analyse how existing products have been constructed. Children disassemble a product and evaluate what the fabric shapes look like, how the parts have been joined, how the product has been strengthen and stiffened, what fastenings have been used and why. • Children investigate properties of textiles through investigation e.g. exploring insulating properties, water resistance, wear and strength of textiles. • Develop skills of threading needles and joining textiles using a range of stitches. This activity must build upon children's earlier experiences of stitches e.g. improving appearance and consistency of stitches and introducing new stitches. If available, demonstrate and allow children to use sewing machines to join fabric with close adult supervision. • Develop skills of sewing textiles by joining right side together and making seams. Children should investigate how to sew and shape curved edges by snipping seams, how to tack or attach wadding or stiffening and learn how to start and finish off a row of stitches.	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 design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

	perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	**Functionality** **Aesthetics** **Evaluate**	• Evaluate it personally and seek evaluation from others.	• Develop skills of 2-D paper pattern making using grid or tracing paper to create a 3-D dipryl mock-up of a chosen product. Remind/teach how to pin a pattern on to fabric ensuring limited wastage, how to leave a seam allowance and different cutting techniques. • Develop skills of computer-aided design (CAD) by using on-line pattern making software to generate pattern pieces. Investigate using art packages on the computer to design prints that can be applied to textiles using iron transfer paper. • Set an authentic and meaningful design brief. Children generate ideas by carrying out research using e.g. surveys, interviews, questionnaires and the web. Children develop a simple design specification for their product. • Communicate ideas through detailed, annotated drawings from different perspectives and/or computer-aided design. Drawings should indicate design decisions made, the methods of strengthening, the type of fabrics to be used and the types of stitching that will be incorporated. • Produce step-by-step plans, lists of tools equipment, fabrics and components needed. Allocate tasks within a team if appropriate. • Make high quality products applying knowledge, understanding and skills from IEAs and FTs. Incorporate simple computer-aided manufacture (CAM) if appropriate e.g. printing on fabric. Children use a range of decorating techniques to ensure a well-finished final product that matches the intended user and purpose. • Evaluate both as the children proceed with their work and the final product in use, comparing the final product to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for intended user and purpose, considering others' opinions. Communicate the evaluation in various forms e.g. writing for a particular purpose, giving a well-structured oral evaluation, speaking clearly and fluently.	
Y5 Crime and Punishment	**Design** Design purposeful, functional, appealing	**Design** **Inspiration**	**Designing** • Draw up a specification for their design • Use results of investigations, information	• Using research, discuss a range of relevant products that respond to changes in the environment using a computer control program such as automatic nightlights, alarm systems, security lighting e.g. *Who have the products been designed for and for what purpose? How and why is a computer control program used to operate*	series circuit, parallel circuit, names of switches and components,

More Complex Switches **Focus: Make**	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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of materials and components, including construction	**Data** **Technical Knowledge** **Practical Knowledge** **Practical Knowledge** **Functionality** **Evaluate**	sources, including ICT when developing design ideas. **Making** • Select appropriate materials, tools and techniques. • Measure and mark out accurately. • Use skills in using different tools and equipment safely and accurately. • Cut and join with accuracy to ensure a good-quality finish to the product. **Evaluating** • Evaluate it personally and seek evaluation from others.	*the products? What input devices, e.g. switches, and output devices, e.g. bulbs, have been used?* • Investigate electrical sensors such as light dependent resistors (LDRs) and a range of switches such as push-to-make switches, push-to-break switches, toggle switches, micro switches and reed switches. To gain an understanding of how they are operated by the user and how they work, ask the children to use each component to control a bulb in a simple circuit. Remind children about the dangers of mains electricity. • Children could research famous inventors related to the project e.g. Thomas Edison – light bulb. • Through teacher demonstration and explanation, recap measuring, marking out, cutting and joining skills with construction materials that children will need to create their electrical products. • Demonstrate and enable children to practise methods for making secure electrical connections e.g. using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks. • Drawing on science understanding, ask the children to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches. • Drawing on related computing activities, ensure that children can write computer control programs that include inputs, outputs and decision making. Test out the programs using electrical components connected to interface boxes or standalone boxes. • Teach children how to avoid making short circuits. • Develop an authentic and meaningful design brief with the children. • Ask the children generate innovative ideas by drawing on research and develop a design specification for their product, carefully considering the purpose and needs of the intended user. • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. Drawings should indicate the design decisions made, including the location of the electrical	input device, output device, system, monitor, control, program, flowchart function, innovative, design specification, design brief, user, purpose

	materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			components and how they work as a system with an input, process and output. • Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team. • Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Create and modify a computer control program to enable the product to work automatically in response to changes in the environment. • Critically evaluate throughout and the final product, comparing it to the original design specification. Test the system to demonstrate its effectiveness for the intended user and purpose.	
Y6 The Ancient Maya Food: Celebrating Culture and Seasonality Focus: Evaluating	**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	**Design** **Nutrition** **Inspiration** **Technical Knowledge** **Practical Knowledge** **Evaluate**	**Designing** • Communicate their ideas through detailed labelled drawings. • Develop a design specification. • Plan the order of their work, choosing appropriate materials, tools and techniques. **Making** • Use tools safely and accurately. • Make modifications as they go along. • Achieve a quality product. **Evaluating** • Evaluate their products, identifying strengths and areas for development,	• Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating. • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product. • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas. • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs. • Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. *What ingredients are sourced locally/in the UK/from overseas? What are the key*	ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, 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

	technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria		and carrying out appropriate tests. • Evaluate against their original criteria and suggest ways that their product could be improved.	*ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?* • Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing. • Use a range of questions to support children's ability to evaluate food ingredients and products e.g. *What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?* • Research key chefs and how they have promoted seasonality, local produce and healthy eating. • Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients. • Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically. • Techniques could be practised following a basic recipe to prepare and cook a savoury food product. • Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell. • When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. *Which shape is most appealing and why?* • Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.	design specification, innovative, research, evaluate, design brief
Y6 World War II	**Design** Design purposeful,	**Design**	**Designing**	• Develop a design brief and simple design specification with the children within a context that is authentic and	ingredients, yeast, dough, bran, flour, wholemeal,

Food: Celebrating Culture and Seasonality **Focus: Design**	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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of materials and components,	**Nutrition Inspiration** **Technical Knowledge** **Practical Knowledge** **Practical Knowledge** **Evaluate**	• Communicate their ideas through detailed labelled drawings. • Develop a design specification. • Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways. • Plan the order of their work, choosing appropriate materials, tools and techniques. **Making** • Select appropriate tools, materials, components and techniques. • Use tools safely and accurately. • Make modifications as they go along. • Achieve a quality product. **Evaluating** • Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. • Evaluate against their original criteria and suggest ways that their product could be improved.	meaningful. This can include design criteria relating to nutrition and healthy eating. • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product. • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas. • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs. • Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. *What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?* • Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing. • Use a range of questions to support children's ability to evaluate food ingredients and products e.g. *What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?* • Research key chefs and how they have promoted seasonality, local produce and healthy eating. • Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients.	unleavened, baking soda, 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 design specification, innovative, research, evaluate, design brief

	including construction materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			• Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically. • Techniques could be practised following a basic recipe to prepare and cook a savoury food product. • Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell. • When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. *Which shape is most appealing and why?* • Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.	
Y6 STEM Projects Mechanical Toys	**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,	**Design** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge** **Practical Knowledge**	**Designing** • Communicate their ideas through detailed labelled drawings. • Develop a design specification. • Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways. • Plan the order of their work, choosing appropriate materials, tools and techniques. **Making** • Select appropriate tools, materials, components and techniques. • Assemble components make working models.	• Discuss with the children different types of movement: rotary, oscillating and reciprocating. Make simple models of different types of cams or have toys in which the cam mechanisms can be seen. Use videos, photographs and computer animations of products that cannot be explored through first-hand experience. • Develop an authentic and meaningful design brief with the children. • Children generate innovative ideas by carrying out research including surveys, interviews and questionnaires and develop a design specification for their product, carefully considering the purpose and intended user for their product. • Communicate ideas through detailed, annotated sketches from different views and/or exploded diagrams. The drawings should indicate the design decisions made, including the location of the components, how they work as a system and the appearance and finishing techniques for the product. • Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team. • Encourage children to look for different types of movement in the home and in school.	**Mechanical Toys** cam, snail cam, off-centre cam, peg cam, pear shaped cam 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

	information and communication technology **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, 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 **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria	**Functionality** **Aesthetics** **Evaluate**	• Use tools safely and accurately. • Construct products using permanent joining techniques. • Make modifications as they go along. • Achieve a quality product. **Evaluating** • Evaluate against their original criteria and suggest ways that their product could be improved.	• Use observational drawings and questions to develop understanding of the products in the handling collection and those that children have researched e.g. *How innovative is the product? What design decisions have been made? What type of movement can be seen? What types of mechanical components are used and where are they positioned? What are the input movement, process and output movement of the system? How well does the product work? Why have the materials and components been chosen? How well has it been designed? How well has it been made?* • Children could research and, if possible, visit engineering and manufacturing companies that are relevant to the product they are designing and making e.g. car engine manufacturers • Give children pre-cut cams made from MDF or wooden wheels to mount on a piece of board and observe their movement with a follower. • Demonstrate how to use a hand drill safely to make an off-centre cam and position it accurately in a housing. Ensure children secure the wheel with a G-clamp and use a piece of scrap wood under the wheel to avoid drilling through the bench hook or table. Stress the importance of measuring accurately and checking before cutting any holes or gluing. It is important to line up the cam and follower otherwise the mechanism may not work smoothly. *How high will the cam lift the follower?* • Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Children should use a range of decorative finishing techniques to ensure a well finished final product that matches the intended user and purpose. • Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to make cam mechanisms and construct wooden frames or card housings, as appropriate. Demonstrate the accurate and safe use of tools and equipment. • Evaluate throughout and the final product in use, comparing it to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose.	design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

Y6 STEM Projects Bird Boxes	**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 **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] Select from and use a wide range of	**Design** **Inspiration** **Innovation** **Technical Knowledge** **Practical Knowledge** **Practical Knowledge** **Functionality** **Aesthetics** **Evaluate**	**Designing** • Communicate their ideas through detailed labelled drawings. • Develop a design specification. • Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways. • Plan the order of their work, choosing appropriate materials, tools and techniques. **Making** • Select appropriate tools, materials, components and techniques. • Assemble components make working models. • Use tools safely and accurately. • Construct products using permanent joining techniques. • Make modifications as they go along. • Achieve a quality product. **Evaluating** Evaluate against their original criteria and suggest ways that their product could be improved	• Discuss the brief of designing and making a small-scale frame structure e.g. *Who is the intended user and what is the purpose of the frame structure? Will it be permanent, or can it be easily dismantled? What materials will you use? How will it be joined? How will it be reinforced? How will it be finished?* Children should be encouraged to generate innovative ideas, drawing on their research. Ask children to develop a simple design specification to guide their thinking. • Children should produce a detailed, step-by-step plan, listing tools and materials. • Children's sketches should be annotated with notes to help develop and communicate their ideas. • Encourage children to model their ideas first using materials such as paper, card and paper straws e.g. *How will you make it stable? How will it stand up? How could you make it stronger? Where are the weak points? How could you reinforce them? What tools and materials will you need? How can you improve the design?* • Encourage children to make their products with accuracy. They should regularly evaluate their work and their completed product, drawing on their design specification, and thinking about the intended purpose and user. • Children investigate and make annotated drawings of a range of portable and permanent frame structures, e.g. tents, bus shelters, umbrellas. Use photographs and web-based research to extend the range e.g. *How well does the frame structure meet users' needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced and stiffened? How does the shape of the framework affect its strength? How innovative is the design? When was it made? Who made it? Where was it made?* • Children could research key events and individuals related to their study of frame structures e.g. Stephen Sauvestre – a designer of the Eiffel Tower; Thomas Farnolls Pritchard – designer of the Iron Bridge. They could also learn about locally important design and technology activity related to their project. • Use a construction kit consisting of plastic strips and paper fasteners to build 2-D frameworks. Compare the strength of square frameworks with triangular	**Bird Boxes** frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional

	materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria			frameworks. Ask the children to reinforce square frameworks using diagonals to help develop an understanding of using triangulation to add strength to a structure. • Demonstrate how paper tubes can be made from rolling sheets of newspaper diagonally around pieces of e.g. dowel. Ask children to use these tubes and masking tape or paper straws with pipe cleaners to build 3-D frameworks such as cubes, cuboids and pyramids. *How could each of the frameworks be reinforced and strengthened?* • Demonstrate the accurate use of tools and equipment. Develop skills and techniques using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. • Demonstrate skills and techniques for accurately joining framework materials together e.g. paper straws, square sectioned wood. Ask children to practise these, mounting their joints onto card for future reference.	