Design and Technology Curriculum – Year 5 and 6 – Cycle A

Please refer to Previous Years' Geography assessment documents linked to hierarchies

Link to DT Association guidance – Link to Projects on a Page Documents

Non- Negotiables	Developing Planning and Communicating Ideas	Evaluating Processes and Products	Knowledge and Understanding of Materials and Components
Year 5	• Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	•Investigate and analyse a range of existing products • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Understand how key events and individuals in design and technology have helped shape the world	Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Year 6	• Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	• Investigate and analyse a range of existing products • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Understand how key events and individuals in design and technology have helped shape the world	• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program, monitor and control their products.

Term	Autumn	Spring	Summer
Topic	**Fairground rides** – using motors and lights	**What did the Mayans do for us? -** Bread Making	**What was Life like as a Victorian? -** Toy Makers – Using Cams
Resources	***Due to the specialised nature of the mechanisms in the unit of work, learning intentions and outcomes are very similar.*** Planning resources available on the shared drive. batteries, motors with small pulleys to fit, elastic bands (up to 20 cm), switches, crocodile connecting leads, aluminium foil, construction kit components including pulleys, pulley wheels, cotton reels, wood scraps which might be used as a base, construction material suitable for, making a framework *ie wood strips and card corners OR card boxes,* doweling or stiff wire for making spindles or axles, variety of materials for making the rides *eg card, reclaimed materials,* assorted paper, ribbon, string, elastic bands, paper plates, adhesive, sticky tape, saws, drills and bits, tools for cutting and shaping the above materials, computer and interface connection	Planning resources available on the shared drive. Range of bread products and bread recipes, flours - white, strong, granary and whole-wheat, yeast, small quantities of added ingredients *eg cheese, onion, herbs, spices, dried fruits, seeds, apples, bananas,* tools and equipment *eg weighing scales, mixing bowls, chopping boards, measuring jugs, graters, spoons, rolling pins, pastry brush, bread tins, baking trays, dinner knives,* access to an oven, plastic table covers, antibacterial cleaner, hand-washing and washing-up facilities, aprons, computer, CD-ROM or access to websites	***Due to the specialised nature of the mechanisms in the unit of work, learning intentions and outcomes are very similar.*** a collection of toys containing cams, construction kits, stiff sheet materials, *eg card, foamboard, corrugated plastic, prepared cams (shaped and off-centre wheels),* wooden wheels, doweling, cardboard boxes or wooden frames, PVA glue, masking tape, tools and equipment - bench hooks, saws, hand drill, G-cramp, round file, single-hole punch, paper drill, metal safety ruler, craft knife, cutting mats and glue gun (for teacher use)
Vocabulary	designing *eg model, mock-up, select, modify, improvements, design proposal, criteria* making *eg framework, construct, temporary joins, permanent joins* knowledge and understanding *eg rotation, spindle, axle, drive belt, pulley, electric motor, speed, framework, horizontal, vertical, electric circuit, switch, gearing up or down, computer control, mechanism*	designing *eg evaluating, investigation, preferences, profile, specification, criteria, fair test, costing* making *eg ingredients, quantities, shaping, mixing, topping, kneading, proving, baking, cooking method, grilling, boiling, frying, glazing* knowledge and understanding *eg yeast, wheat, grain, flour, dough, crust, rise* names of tools and equipment sensory characteristics *eg texture, doughy, crisp, chewy, yeasty, stretchy, elastic* food safety *eg hygiene, bacteria, mould, decay, food poisoning*	designing *eg sequence, annotated diagram, sketch, decision, choice, prototype, model, communicate* making *eg shape, assemble, accurate, saw, mark out* knowledge and understanding *eg cam, mechanism, movement, linear motion, rotary motion, pivot, off-centre, axle, force, framework, follower, guide, offset, shaft*
Lesson 1	**Year 5:** To look at a range of familiar products that use rotating parts. **Year 6:** To look at a range of products that use rotating parts. **Activities:** Children to explore and discuss different fairground rides they have been on. They will think about how they move, what are the components that join them together and the mechanisms that make them work by labelling different pictures of fairground rides. **Outcomes:** **Year 5 -** Children identify everyday objects that use electrical motors to cause rotation • Children explain how electrical circuits and motors are used to make objects rotate **Year 6 --** Children identify everyday objects that use electrical motors to cause rotation • Children identify how rotation is used in fairground rides • Children explain how electrical circuits and motors are used to make objects rotate	**Year 5:** To investigate and evaluate bread products **Year 6:** To investigate and evaluate bread products according to their characteristics. **Activities:** Children will learn about different types of bread and the cultures and/or regions from which they originate. They will then taste and describe a variety of breads. **Outcomes:** **Year 5 -** • Children name and identify the origin of bread products • Children use appropriate vocabulary to describe bread products • Children compare and evaluate bread products **Year 6 -** • Children name and identify the origin of a number of bread products • Children use appropriate vocabulary to describe bread products • Children compare and evaluate a variety of bread products	**Year 5:** To investigate toys with moving cam mechanisms. **Year 6:** To investigate a variety of toys with moving cam mechanisms. **Activities:** Children will think of and investigate different moving toys. They will learn about cam mechanisms and explore different toys that use them. **Outcomes:** **Year 5 -** Children recognise the movement of a mechanism within a toy or model • Children understand that a cam mechanism will change rotary motion into linear motion • Children investigate examples of cam toys and comment on how they work **Year 6 -**Children recognise the movement of a mechanism within a toy or model • Children understand that a cam mechanism will change rotary motion into linear motion • Children investigate examples of cam toys and comment on how they work
Lesson 2	**Year 5:** To investigate ways of using electrical motors to create rotation. **Year 6:** To investigate ways of using electrical motors to create rotating parts.	**Year 5:** To learn how bread products part of a balanced diet and can be eaten in different ways.	**Year 5:** To investigate cam mechanisms. **Year 6:** To investigate different types of cam mechanisms.

	Activities: Children to explore and investigate electrical motors and how they make fairground rides rotate. They (Y6) will learn about pulley and belt systems and use appropriate materials to create a circuit that would be suitable for different fairground rides. **Outcomes:** **Year 5 -** Children describe how an electrical circuit with a motor can be used to create rotating parts • Children use electrical components to investigate ways of creating replica fairground rides **Year 6 -**Children describe how an electrical circuit with a motor can be used to create rotating parts • Children understand how pulley and belt systems can be used to transfer movement • Children use electrical components to investigate ways of creating replica fairground rides	**Year 6:** To learn how bread products are an important part of a balanced diet and can be eaten in different ways. **Activities:** Children will learn about the nutritional content of bread, then consider some different ways it may be used in meals. Following this, children may either conduct surveys or prepare to collect data about eating bread **Outcomes:** **Year 5 -** Children understand the contribution bread can make to a healthy diet • Children use a recording sheet to complete a survey • Children evaluate their findings? **Year 6 -**• Children understand the contribution bread can make to a healthy diet • Children use a recording sheet to complete a survey • Children prepare data, present and evaluate their findings?	**Activities:** Children will explore and investigate different types of cam mechanisms and think about the shapes they will produce. They will be testing different shaped cams to see how they affect the linear movement of the follower. **Outcomes:** **Year 5 - -**• Children describe how cams work • Children explore how different shaped cams affect the movement of the follower • Convert rotary motion to linear using cams. •Children make suggestions for how different cams could be used for different kinds of toys **Year 6 -**• Children describe how cams work using appropriate vocabulary • Children explore how different shaped cams affect the movement of the follower • Convert rotary motion to linear using cams. •Children make suggestions for how different cams could be used for different kinds of toys
Lesson 3	**Year 5:** To investigate ways of making a framework for a fairground ride. **Year 6:** To investigate ways of making a framework for a fairground ride. **Activities:** Children to explore and investigate creating a framework for different fairground rides in preparation for designing and making their own fairground ride. They will work through various challenges to learn different skills that will help with constructing their fairground ride. **Outcomes:** **Year 5 -** Children describe ways of strengthening and reinforcing structures • Children suggest ways in which ideas for frameworks could be developed to ideas for their own fairground ride designs (with support) • Children use a variety of materials and components accurately **Year 6 -**Children describe ways of strengthening and reinforcing structures • Children suggest ways in which ideas for frameworks could be developed to ideas for their own fairground ride designs • Children use a variety of materials and components accurately	**Year 5:** To find out which ingredients are needed to make bread and how ingredients can be mixed to create different effects. **Year 6:** To find out which different ingredients are needed to make bread and how ingredients can be altered and mixed to create different effects. **Activities:** Children will learn about the ingredients of bread and how they may be used. They will then make bread, adapting and changing the recipe either according to given instructions or according to their own ideas. **Outcomes:** **Year 5 -** Children follow instructions • Children weigh and measure with greater accuracy • Children experiment with different ways of altering a basic bread mixture **Year 6 -** • Children follow instructions • Children weigh and measure with greater accuracy including calculating ratios of ingredients • Children experiment with different ways of altering a basic bread mixture successfully	**Year 5:** To investigate ways of strengthening structures for a moving toy. **Year 6:** To investigate ways of strengthening structures for a moving toy. **Activities:** Children to explore materials and investigate different ways of strengthening moving toy structures. **Outcomes:** **Year 5 -** • Children make suggestions for how they could make a structure for a moving toy • Children experiment with a variety of materials, tools and techniques • Children identify ways of strengthening a structure **Year 6 -**• Children make suggestions for how they could make a sturdy structure for a moving toy • Children experiment with a variety of materials, tools and techniques • Children identify ways of strengthening a structure
Lesson 4	**Year 5:** To be able to design a fairground ride with a rotating part. **Year 6:** To be able to design a fairground ride with a rotating part. **Activities:** Children to use all the information they have acquired over the last few lessons to design their own fairground ride. They will need to consider what motor to use for the rotating part as well as what materials will create an effective stable framework. **Outcomes:** **Year 5 - -**• Children decide about what kind of ride they will make • Children design an appropriate electrical circuit for their ride • Children describe the process they will need to go through to complete their product **Year 6 -**• Children decide about what kind of ride they will make • Children design an appropriate electrical circuit for their ride • Children describe the process they will need to go through to successfully complete their product	**Year 5:** To be able to design a new bread product for a particular event. **Year 6:** To be able to design a new bread product for a particular person or event. **Activities:** Children will create their own bread recipes and develop ideas regarding how it may be turned out, e.g. flat, plaited, as a large 'bun'. **Outcomes:** **Year 5 -** Children use the results of investigations when developing design ideas • Children explain how they will make their product • Children explain what purpose they are designing and creating their product for **Year 6 -** Children use the results of investigations when developing design ideas • Children explain how they will make their product • Children explain what purpose they are designing and creating their product for • Create and refine recipes, including ingredients, methods, cooking times and temperatures.	**Year 5:** To be able to design a moving toy with a cam mechanism. **Year 6:** To be able to design a moving toy with a cam mechanism. **Activities:** Children will use their previously learnt knowledge to design a moving toy with a cam mechanism. They will need to think about who the toy is for, what shape the cam will be, the structure, decoration and materials needed to construct it. **Outcomes:** **Year 5 -** Children state the audience of their design • Children design a moving toy with a cam mechanism • Children describe how they will create their toy and what materials and tools they will need **Year 6 -**Children state the purpose and audience of their design • Children design a moving toy with a cam mechanism • Children describe how they will create their toy and what materials and tools they will need
Lesson 5	**Year 5:** To be able to make a fairground ride **Year 6:** To be able to make a fairground ride following a design. **Activities:** Children to follow their designs to create their fairground ride with a rotating part. They will need to ensure they are working safely and carefully **Outcomes:** **Year 5 -** • Children follow a design to create a fairground ride with a rotating part • Children work accurately and safely with a variety of tools, materials	**Year 5:** To be able to make bread based on a plan **Year 6:** To be able to make bread based on a plan and design. **Activities:** Referring to previously created designs, children will make and bake their own bread. **Outcomes:** **Year 5 -** Children apply what they have learnt when making their product • Children follow a design with some accuracy • Children work safely and hygienically	**Year 5:** To be able to follow a design to create a moving toy with a cam mechanism. **Year 6:** To be able to follow a design to create a moving toy with a cam mechanism. **Activities:** Children will refer to their designs from the previous lesson to create their moving toys. **Outcomes:**

	and electrical components • Children identify ways of improving their fairground rides to create a finished product **Year 6 -**• Children follow a design to create a fairground ride with a rotating part • Children work accurately and safely with a variety of tools, materials and electrical components • Children identify ways of improving their fairground rides to create a finished product of a high quality	**Year 6 -**Children apply what they have learnt when making their product • Children follow a design accurately • Children work safely, hygienically and accurately • Demonstrate a range of baking and cooking techniques.	**Year 5 -** Children follow a design to create a moving toy • Children work safely with a variety of materials and tools • Children identify areas of their toy that could be improved upon **Year 6 -** Children follow a design to create a moving toy • Children work safely with a variety of materials and tools • Children identify areas of their toy that could be improved upon
Lesson 6	**Year 5:** To be able to evaluate a finished product. **Year 6:** To be able to evaluate a finished product. **Activities:** Children will demonstrate their finished moving fairground ride then evaluate both their process and their finished product, either individually or with a partner. **Outcomes:** **Year 5 - -**• Children evaluate a finished product fairly • Children suggest ways they could improve their product if they were to make it again • Children recognise ways in which they have been successful **Year 6 -**• Children evaluate a finished product fairly • Children suggest ways they could improve their product if they were to make it again • Children recognise ways in which they have been successful	**Year 5:** To be able to evaluate a finished product. **Year 6:** To be able to evaluate a finished product. **Activities:** Children will taste and evaluate their own bread recipes. Some children may suggest ways in which their recipe/design may be improved. **Outcomes:** **Year 5 -** • Children evaluate a finished product • Children describe how they could make further improvements to their product • Children evaluate what they have learnt throughout the course of the module **Year 6 -** • Children evaluate a finished product fairly • Children describe how they could make further improvements to their product if they were to make it again • Children evaluate what they have learnt throughout the course of the module	**Year 5:** To be able to evaluate a finished moving toy. **Year 6:** To be able to evaluate a finished moving toy. **Activities:** Children will demonstrate their finished moving toys, then evaluate both their process and their finished product, either individually or with a partner. **Outcomes:** **Year 5 -** Children evaluate a finished product fairly • Children suggest ways they could improve their product • Children recognise ways in which they have been successful **Year 6 -** Children evaluate a finished product fairly • Children suggest ways they could improve their product if they were to make it again • Children recognise ways in which they have been successful

Assessment Criteria

	Exploring Existing Products	Developing Ideas	Making New Products	Evaluating
Year 5	I can investigate, analyse and evaluate a range of existing products.	• I can work from my own detailed plans when constructing my product.	• I can measure, cut and shape a range of materials with increasing accuracy. • I can assemble, join and combine components accurately. • I can construct circuits incorporating a power supply and a switch to make electrical devices work (eg buzzer/motor). • I can incorporate these circuits into a model. • I can create and use range of mechanisms (eg pulley systems, drive belt, cam, levers). • I can construct a model incorporating at least one control mechanism	• I can evaluate finished products, suggesting alternative techniques which could achieve improvements, showing an awareness of fitness for purpose.
Year 6	I can identify a range of products which incorporate mechanical systems and explain how these work.	• I can use my understanding of the characteristics of familiar products when developing and communicating my own ideas. • I can work from my own detailed plans when constructing my product, modifying them as appropriate.	• I can measure, cut and shape a range of materials selected according to fitness for purpose. • I can construct circuits incorporating a power supply and a range of switches to make electrical devices work (eg buzzer/motor). • I can incorporate these circuits into a model. • I can create and use range of mechanisms (eg pulley systems, drive belt, cam, levers). • I can construct a model incorporating at least one control mechanism	. • I can evaluate my work as it develops, and modify my approach in the light of progress.