# Design and Technology Curriculum – Year 3 and 4 – 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

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| **National Curriculum Key Stage 2** | Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].<br>When designing and making, pupils should be taught to:<br>**Design** ♣ 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<br>**Make** ♣ select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♣ select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities<br>**Evaluate** ♣ 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<br>Technical knowledge ♣ apply their understanding of how to strengthen, stiffen and reinforce more complex structures ♣ 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.<br>**Cooking and nutrition**<br>As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br>***Pupils should be taught to:***<br>**Key stage 2** ♣ understand and apply the principles of a healthy and varied diet ♣ prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques ♣ understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. |

| | **Developing Planning and Communicating Ideas** | **Evaluating Processes and Products** | **Knowledge and Understanding of Materials and Components** |
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| **Non-Negotiables** | • 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 |
| **Non-Negotiables Year 4** | • 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. |

| | **Autumn 2 – Design a Pencil Case** | **Spring 1: Sculpture - Packaging and Nets** | **Summer – Photo frames** |
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| **Hierarchies** | **To master practical skills:**<br>DT6: Measure and mark out to the nearest millimetre.<br>DT7: Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).<br>DT8: Select appropriate joining techniques (in the context of sewing)<br>DT9: Understand the need for a seam allowance.<br>DT10: Join textiles with appropriate stitching.<br>DT11: Select the most appropriate techniques to decorate textiles.<br>**To design, make, evaluate and improve:**<br>DT17: Design with purpose by identifying opportunities to design.<br>DT18: Make products by working efficiently (such as by carefully selecting materials).<br>DT19: Refine work and techniques as work progresses, continually evaluating the product design.<br>**To take inspirations form designers from history:**<br>DT21: Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.<br>DT22: Improve upon existing designs, giving reasons for choices.<br>DT23: Disassemble products to understand how they work.<br>**Revisiting Year ½:** working with textiles – finger puppets<br>**Revisiting Cycle B:** Art textiles | **To master practical skills:**<br>DT6: Measure and mark out to the nearest millimetre.<br>DT7: Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).<br>DT8: Select appropriate joining techniques<br>**To design, make, evaluate and improve:**<br>DT17: Design with purpose by identifying opportunities to design.<br>DT18: Make products by working efficiently (such as by carefully selecting materials).<br>DT19: Refine work and techniques as work progresses, continually evaluating the product design.<br>DT20: Use software to design and represent product designs.<br>**To take inspirations form designers from history:**<br>DT21: Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.<br>DT22: Improve upon existing designs, giving reasons for choices.<br>DT23: Disassemble products to understand how they work.<br>**Revisiting Year ½:** working with stiff materials – making a castle<br>**Revisiting Cycle B:** working with stiff materials – Moving story books | **To master practical skills:**<br>DT6: Measure and mark out to the nearest millimetre.<br>DT7: Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).<br>DT8: Select appropriate joining techniques<br>**To design, make, evaluate and improve:**<br>DT17: Design with purpose by identifying opportunities to design.<br>DT18: Make products by working efficiently (such as by carefully selecting materials).<br>DT19: Refine work and techniques as work progresses, continually evaluating the product design.<br>**To take inspirations form designers from history:**<br>DT21: Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.<br>DT22: Improve upon existing designs, giving reasons for choices.<br>DT23: Disassemble products to understand how they work.<br>**Revisiting Year ½:** cutting wood for axels,<br>**Revisiting Cycle B:** |
| **Resources** | Guidance resources on shared drive<br>collection of pencil cases/ bags made from different materials, from different cultures, and with a range of fastenings, selection of fabrics eg felt, calico, hessian, selection of fastenings used on purses, wallets and bags, scissors for fabric, thread, tape, needles, fabric glue, materials for decorative techniques eg embroidery thread and needles, dye, fabric crayon and paints<br>**Texts:** | Guidance resources on shared drive<br>a collection of packaging for different purposes eg from confectionery, biscuits, toys or breakfast cereal, paper, squared paper, coloured card, tissue paper, clear adhesive tape, masking tape, PVA glue, clear and tinted acetate film or sheet, range of tools for marking out, cutting and joining paper and card eg pencils, rulers, scissors, glue spreaders, coloured pencils and/or felt-tip pens, computer and printer with a word processing/graphics program<br>**Texts:** | Guidance resources on shared drive<br>examples of stable structures *eg mug tree, tripod, stool, music stand,* examples of free-standing photograph frames, variety of construction kits, suitable for developing understanding of structures, materials for decoration *eg paint, fabric, colour magazines for collage, sequins,* newspaper, board, thick card, thin card, recycled card *eg cereal-packet, card,* acetate sheets *eg overhead transparencies,* squared paper, PVA glue, masking tape, paper clips, scissors, snips, pipe-cleaners<br>**Texts:** |

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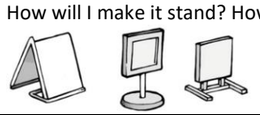
| **Vocabulary** | designing eg user, purpose, design criteria, model, evaluating, labelled drawings, stiffening, reinforcing, coins, notes<br>making eg pattern/templates, strength, weaknesses, accurate, finishing<br>knowledge and understanding eg fabric, fastening, compartment, zip, press stud, clasp, hook and eye, button, buckle, seam, seam allowance, reinforce, gusset, dye, embroidery, properties eg strength, hard-wearing, stretch, fray | designing eg font, graphic, decision, evaluating, criteria, fit for purpose, holds<br>making eg scoring, tabs, adhesives, join, assemble, accuracy<br>knowledge and understanding eg three-dimensional (3D) shape, cube, cuboid, prism, net, vertex, edge, face, packaging, shell structure, breadth, capacity | designing eg user, choice, decoration, quality, component parts, purpose<br>making eg planning, order, layering, cutting, finish, board<br>knowledge and understanding eg stable, free-standing, stiffen, frame, sturdy, reinforce, quality, distance, near, close, wide, narrow, deep, shallow, thick, thin,<br>aesthetics, component, |
| **Flashback** | • **what a winding mechanism is**<br>• **how to construct a winding mechanism with a straight axle and one moving part.**<br>• **know how to cut materials safely (stiff materials and wood using scissors and saws)** | • **the need for a seam allowance.**<br>• **To measure and mark out with accuracy**<br>• **how to join textiles with appropriate stitching.** | • **apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots, extended tabs or cut outs).**<br>• **understand that 3-D structures can be constructed from nets.**<br>• **mark out, cut, score and assemble a 3-D net measuring to the nearest mm** |
| **Lesson 1** | **WALT:** explore a range of pencil cases and examine their features.<br>**Activities:** Children will study, describe and compare a variety of different pencil cases. They may then either examine some pencil cases – drawing and labelling them, or answer questions about a variety of pencil cases.<br>**Children will know;**<br>• pencil cases are designed for different purposes and users.<br>• features common to all pencil cases.<br>• How to draw, label and evaluate different pencil cases. | **WALT:** investigate a range of packaging.<br>**Activities:** Children will think, and study pictures, of a variety of packaging for food and other products. They may then either examine and deconstruct cardboard packaging, or answer questions about given images of packaging.<br>**Children will know;**<br>• that packaging serves a variety of purposes.<br>• how to deconstruct a packaging box and explain how it was put together (more complex boxes).<br>• the need to extend the net to incorporate tabs for joining | **WALT:** investigate free-standing structures and how they are made stable<br>**Activities:** Children will study a variety of free-standing objects (photo frames, tripods, easels, stools, music stands…) and consider what makes them strong and stable.<br>Discuss features of photo frames E.g. frame, picture, stand and materials used to make them – why? (Sturdy, hardwearing, attractive). How have the photo frames been joined?<br>How do they stand up? Do they display the photo clearly?<br>They may then either sketch and annotate a variety of photograph frame designs, or examine some photograph frames.<br>**Children will know;**<br>• how everyday free-standing objects have been made stable.<br>• And identify the different components of a photograph frame.<br>• And compare photograph frames and talk about their features. |
| **Lesson 2** | **WALT:** know how to sew using a range of different stitches.<br>**Activities:** Children will identify ways in which pencil cases have been joined by sewing, then either practise joining scrap material by hand sewing, or practising decorative hand sewing techniques. Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).<br>**Children will know;**<br>• ways a pencil case has been joined (stitching).<br>• How to join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration) | **WALT:** construct nets for different 3-D shaped packages.<br>**Activities:** Children will learn that many types of cardboard packaging may be constructed using 2-D nets. They will then investigate how 2-D nets are made and constructed to make 3-D packages. Children to explore a range of nets and select which net would be best for their packaging suggesting the reason why.<br>**Children will know;**<br>• understand that 3-D structures can be constructed from nets.<br>• mark out, cut, score and assemble a 3-D net.<br>• different nets to certain product types. | **WALT:** measure and cut cm squared wood accurately<br>**Activities:**<br>Demonstrate measuring, marking and safe cutting of wood.<br>All children measure and mark their wood for their frame and then check it.<br>Children to cut the wood for their finished frame under observation in small groups using bench hooks for stability (TAT by teacher).<br>Why do we use the cardboard triangles in the corner of the frame?<br>Safe use of saw. (This will form the basis of their frame)<br>**Children will know;**<br>• ways of making stable structures.<br>• different techniques for strengthening and joining |
| **Lesson 3** | **WALT:** gather and generate ideas for designing a pencil case.<br>**Activities:** Children will begin to develop ideas for making a pencil case, either by cutting, folding and joining paper to explore ideas, or constructing model containers using given templates.<br>**Children will know;**<br>• How to make a template including a seam allowance.<br>• How to mark out measurements accurately<br>• that modelling can be used to try out different ideas. | **WALt:** explore the use of graphics on packaging.<br>**Activities:** Children will study a variety of different graphics on packaging, suggesting reasons for the differences, and who they might have been designed for. They may then either practise writing in different font styles, or use software to select and use different fonts for a variety of given purposes.<br>**Children will know;**<br>• how graphics are used to create effects.<br>• the graphics on a product reflect who and what the packaging in designed for.<br>• Different fonts can be used for different intended purpose | **WALT:** assemble card frame,<br>**Activities:** Demonstrate marking and cutting of strong card to make backing and frame (use templates?).<br>Children mark and cut out their frames and stick onto wood using PVA glue.<br>**Children will know;**<br>• ways of making strong and stable structures.<br>• And can evaluate different types of structures.<br>• mark, cut and join their card to the wooden frame accurately |
| **Lesson 4** | **WALT:** design a pencil case for a purpose<br>**Activities:** Children will draw and annotate designs for pencil cases for an 'audience' of their choosing. Alternatively, they may design a pencil case for a given audience and/or purpose.<br>**Children will know;**<br>• how to write a simple specification for their design.<br>• how to produce a detailed design for their pencil case. | **WALT:** design a packaging box for a particular purpose<br>**Activities:** Children will apply their prior learning when designing packaging for a product, audience and purpose of their choice.<br>**Children will know;**<br>• how to use what they have learnt about packaging when designing their own packaging box.<br>• How to design a product that is suitable for the intended user. | **WALT:** design a photograph frame for a particular purpose.<br>**Activities:** Children will draw and annotate their own designs for a photograph frame, considering how they will ensure it is strong, stable and free-standing.<br>How will I make it stand? How will I make it stable? How will it be joined?<br>  |

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| | • how they will create their pencil case | • How to incorporate appropriate graphics in their design | **Children will know;**<br>• apply what they have learnt about making stable structures in their design ideas.<br>• design a photograph frame that would be suitable for a particular purpose.<br>• how they will make their finished product of a high quality |
| **Lesson 5** | **WALT:** make a pencil case using textiles.<br>**Activities:** Children will, based on previously completed designs, make pencil cases using hand sewing techniques.<br>**Children will know;**<br>• how to follow their design to create a pencil case.<br>• to use accuracy and control when working with textiles<br>• finishing techniques to make their pencil case aesthetically pleasing. | **WALT:** make a packaging box by following a design.<br>**Activities:** Referring to their own, previously completed designs, children will make packaging boxes. Children will apply their prior learning when designing packaging for their pizza, audience and purpose of their choice including consideration of graphics.<br>**Children will know;**<br>• use what they have learnt about packaging when designing their own packaging box.<br>• how to design a product that is suitable for the intended user.<br>• to incorporate appropriate graphics in their design | **WALT:** make a stable photograph frame from a design.<br>**Activities:** Referring to their previously completed designs, children will make photograph frames. They are challenged to consider carefully how they will ensure their frame looks like their design.<br>**Children will know;**<br>• follow a design to create a photograph frame.<br>• how to create a strong and stable structure.<br>• ways in which they could improve their finished product |
| **Lesson 6** | **WALT:** evaluate a finished product.<br>**Activities:** Children will show and evaluate their finished pencil cases, either individually or in small groups.<br>**Children will know;**<br>• evaluate their own finished products.<br>• ways in which they could improve their work. | **WALT:** evaluate a finished product.<br>**Activities:** Children will evaluate both their design process and their finished product, either individually or with a partner.<br>**Children will know;**<br>• evaluate their own product.<br>• ways in which they could improve their product if they were to make it again<br>• they can comment on the work of others and say what they think and feel about them. | **WALT:** evaluate a finished product.<br>**Activities:** When evaluating photograph frames, it is important to identify: 1. How the frame is able to stand up 2. How the photo is inserted 3. What kind of picture the frame is for 4. How well the frame displays the photograph 5. Who would use the frame 6. Where the frame could stand<br>  <br>**Children will know;** Children will evaluate their own design process as well as their finished photograph frame according to a range of given, and agreed upon, criteria.<br>• evaluate their finished product.<br>• ways in which they would change their design if they were to make their photograph frame again.<br>• to assess how well their finished product meets the original design criteria |
| **Key Knowledge** | **Children will know;**<br>• the need for a seam allowance.<br>• To measure and mark out with accuracy<br>• how to join textiles with appropriate stitching. | **Children will know;**<br>• apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots, extended tabs or cut outs).<br>• understand that 3-D structures can be constructed from nets.<br>• mark out, cut, score and assemble a 3-D net measuring to the nearest mm | **Children will know;**<br>• how everyday free-standing objects have been made stable.<br>• ways of making strong and stable structures.<br>• and use strengthening and joining techniques. |