



Amherst School – D.T. Curriculum

Intent

At Amherst, we believe the DT curriculum to be practical, inspiring and rigorous, requiring creativity, resourcefulness, and imagination. At Amherst, pupils learn about different DT skills as well as be given the opportunity to design and make products that relate to real and relevant problems within a variety of contexts. We aim for pupils to build on their knowledge and skills, critically evaluating products and reflecting on their learning and work.

We are proud of our broad and balanced DT Curriculum where the children can test out their own ideas in a practical way with freedom and enjoyment.

Vocabulary Key: **Year 3**, **Year 4**, **Year 5**, **Year 6**. Underlined = minimum expectation for children's retrieval.

Year 3 – Pop-ups

| Key vocabulary | | Suggested trips or workshops |
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| <u>Mood-board</u> <u>Christmas</u> <u>Pop-up</u> Mechanism Prototype <u>Material</u> | <u>Evaluating</u> Folding Cutting Joining | |
| Prior knowledge and skills <ul style="list-style-type: none"> KS1 Science: Using cardboard/paper for particular uses. KS1 D.T.: Using simple design criteria to develop and evaluate ideas. KS1 D.T.: Using appropriate equipment to perform practical tasks (cutting, shaping, joining and finishing). | | |
| Key questions <ol style="list-style-type: none"> What was the purpose of creating pop-up cards? How does your pop-up mechanism work? What features make a good pop-up card? Which of these features does your card include? | | |
| 1 | Learning objective | I can create a mood-board. |
| | Knowledge | <ul style="list-style-type: none"> Pop-ups are used in books and cards. Different pop-ups work in different ways. Pop-ups can be added to increase appeal and interactivity of the product. Christmas cards being given is part of the culture of Christmas in Britain. |
| | Skills | <ul style="list-style-type: none"> Identifying how a pop-up moves. Developing ideas aimed at particular individuals. |
| | Suggested activities | <ul style="list-style-type: none"> Children explore a range of pop-ups including books and cards. Create an annotated moodboard answering the question: What does Christmas mean to me? |
| 2 | Learning objective | I can use basic pop-up techniques. |
| | Knowledge | <ul style="list-style-type: none"> There are different pop-up mechanisms. Different shapes work better with specific mechanisms. It is important to create a prototype to aid in the design process in D.T. |
| | Skills | <ul style="list-style-type: none"> Creating different pop-up mechanisms. Considering what designs might work with different mechanisms. Cutting thoughtfully and carefully. Folding accurately and neatly to produce a crisp and sharp fold. Joining pop-up mechanisms correctly. |

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| | Suggested activities | - Children follow tutorials to create prototypes for three different pop-up mechanisms. |
| 3 | Learning objective | I can design a pop-up card. |
| | Knowledge | - Using card, provides more structure than paper. |
| | Skills | - Designing with purpose in mind. - Designing achievable and simple mechanisms as part of a Christmas scene. |
| | Suggested activities | - Children draw up to four designs focusing on the purpose and Christmas theme and then select two to create in the next lesson. |
| 4 & 5 | Learning objective | I can create a pop-up card. |
| | Knowledge | - Christmas cards need to be aesthetically pleasing and suitable for the target audience. |
| | Skills | - Cutting, joining, folding, measuring. - Assembling, joining and combining materials with some accuracy. - Decorating cards using themes from initial mood-board. - Using finishing techniques to produce an aesthetically pleasing and appealing card. - Applying understanding and learning from science (using paper and cardboard for particular uses) to make a successful pop-up card. |
| | Suggested activities | - Using their designs, children create two pop-up cards using different pop-up mechanisms, ensuring they consider who they are giving their cards to. |
| 6 | Learning objective | I can evaluate my work. |
| | Knowledge | - |
| | Skills | - Evaluate own cards in comparison to pop-up books and cards - Being self-reflective about ways to improve - Evaluate card against design criteria: card, pop-ups, Christmas |
| | Suggested activities | - Evaluation form including a picture - Write a sentence evaluating work |

Year 3 – Roman Catapults

| Key vocabulary | | Suggested trips or workshops |
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| Lever Pivot Tension Arm Catapult Weapon | Base Pull Dowling Elasticity Elastic band Mechanism | |
| Prior knowledge and skills | | |
| <ul style="list-style-type: none"> • Creating a product for a purpose. • Creating working mechanisms. • Joining materials effectively. | | |
| Key questions | | |
| <ol style="list-style-type: none"> 1. What is the purpose of a catapult? 2. How does your catapult work? 3. What features make a good catapult? 4. Which of these features does your catapult include? | | |
| 1 | Learning objective | I can understand how a range of mechanisms create movement. Note – This history lesson on Roman weapons must be delivered before this D.T. unit. |
| | Knowledge | - Materials have both functional properties and aesthetic qualities. |

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| | | <ul style="list-style-type: none"> - Materials can be combined to create more useful characteristics. - Levers use different mechanisms. - The elasticity of elastic bands is useful for creating movement in catapults. - The pivot point will impact how effective a lever is. |
| | Skills | <ul style="list-style-type: none"> - Investigating mechanisms to gain understanding. |
| | Suggested activities | <ul style="list-style-type: none"> - Rotation of activities including different levers and the use of elastic bands. |
| 2 | Learning objective | I can create simple catapults using levers. |
| | Knowledge | <ul style="list-style-type: none"> - Catapults function using a lever around a pivot point, relying on tension to provide the force. - A catapult needs a strong base which is often wider than the other elements forming the catapult. - Triangles provide greater strength than other shapes. |
| | Skills | <ul style="list-style-type: none"> - Following written instructions. - Assembling, joining and combining materials. - Communicating methods and ideas with others. - Using elastic bands to secure joints (this needs to be explicitly taught). |
| | Suggested activities | <ul style="list-style-type: none"> - Children work in small groups. Each group creates one catapult using written instructions. Once completed, children share how their catapult was made and functions with children from other groups. |
| 3 | Learning objective | I can design a catapult. |
| | Knowledge | <ul style="list-style-type: none"> - A catapult will require: strong base, pivot point, lever, sufficient tension in elastic bands, secure joints. |
| | Skills | <ul style="list-style-type: none"> - Applying understanding from previous lesson to inform design choices. - Drawing a clear diagram which communicates the outcome. - Annotating a diagram effectively. - Choosing appropriate materials for different purposes. |
| | Suggested activities | <ul style="list-style-type: none"> - Children design and annotate their own catapult including materials. |
| 4 & 5 | Learning objective | I can make a catapult. |
| | Knowledge | <ul style="list-style-type: none"> - How to work safely (refer to D.T. safety rules). - It is important to work in a logical and systematic way. |
| | Skills | <ul style="list-style-type: none"> - Gathering appropriate materials. - Joining and assembling using previous skills. - Working in a logical and systematic way. - Testing and adapting catapult throughout the making process to improve finished product. |
| | Suggested activities | <ul style="list-style-type: none"> - Children make their own catapult, testing and adapting throughout in order to produce a working mechanism. |
| 6 | Learning objective | I can test the effectiveness of my design. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Using a catapult to fire a small object. - Evaluating the effectiveness of design including materials, joints, function and finishing. - Measuring the distance object travels using a tape measure. - Adapting firing technique in response to previous attempts. |
| | Suggested activities | <ul style="list-style-type: none"> - Children take it in turns to fire object (midget gem). They each have three tries and record the furthest distance. They then complete evaluation sheet. |

Year 3 – Healthy Pitta Pizzas

| Key vocabulary | | Suggested trips or workshops |
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| Carbohydrates Fruit Vegetable Protein Dairy Healthy The Eatwell Guide | <u>Pizza</u> <u>Chopping</u> <u>Grating</u> <u>Slicing</u> | |
| Prior knowledge and skills | | |
| <ul style="list-style-type: none"> Basic understanding of the five elements of The Eatwell Guide | | |
| Key questions | | |
| <ol style="list-style-type: none"> What makes a healthy diet? How is your pitta pizza healthy? What skills did you use when making your pizza? Why is hygiene and safety important when preparing food? | | |
| 1 | Learning objective | I can explain the elements of a healthy diet. |
| | Knowledge | <ul style="list-style-type: none"> The Eatwell Guide shows how much of what we eat overall should come from each food group to achieve a balanced diet in order to be active and healthy. The Eatwell Guide separates foods into 5 groups: carbohydrates, proteins, fruits/vegetables, fats, dairy. We need to eat different amounts of the food groups for a healthy diet. |
| | Skills | <ul style="list-style-type: none"> Identifying which food group different food types belong to. |
| | Suggested activities | <ul style="list-style-type: none"> Children sort food items into a diagram of The Eatwell Guide, labelling the different food groups. |
| 2 | Learning objective | I can use a range of techniques for food preparation. |
| | Knowledge | <ul style="list-style-type: none"> Hygiene is very important in food preparation. Specific equipment is required for different purposes in food preparation. |
| | Skills | <ul style="list-style-type: none"> Grating using the appropriate part of the grater, keeping fingers away from the blades. Slicing and chopping using a sharp knife on a chopping board, using the bridge and claw cutting techniques. Holding the item securely when grating and cutting. |
| | Suggested activities | <ul style="list-style-type: none"> Children practise grating, slicing and chopping techniques using carrots. |
| 3 | Learning objective | I can design a healthy pitta pizza. |
| | Knowledge | <ul style="list-style-type: none"> A healthy pizza should include elements from different food groups. Larger food items need to be cut and arranged on a pizza for it to look and taste appetising. Every bite of a pizza should contain the same ingredients. |
| | Skills | <ul style="list-style-type: none"> Choosing foods from different food groups which compliment each other. |
| | Suggested activities | <ul style="list-style-type: none"> Children design pitta pizza, drawing on knowledge from previous lessons by identifying the food group of chosen ingredients. Children should select toppings from different food groups. |
| 4 & 5 | Learning objective | I can make a healthy pitta pizza. |
| | Knowledge | <ul style="list-style-type: none"> As per previous lessons. |
| | Skills | <ul style="list-style-type: none"> Independently applying skills and knowledge from previous lessons. Working hygienically and safely. |
| | Suggested activities | <ul style="list-style-type: none"> Children prepare toppings and create their own pitta pizza. Design pizza box that is appealing and relevant to their design. |

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| 6 | Learning objective | I can evaluate my product. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Evaluate own pizza in comparison to initial design. - Being self-reflective about ways to improve. - Evaluate pizza against design criteria: healthy, pizza, aesthetically pleasing, tasty. |
| | Suggested activities | - Evaluation form including a picture involving both aesthetic elements and taste. |

Year 4 – Christmas Decorations

| Key vocabulary | | Suggested trips or workshops |
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| <u>Running stitch</u> Back stitch <u>Whip stitch</u> Blanket stitch <u>Needle</u> <u>Felt</u> | Finishing off Knotting Thread Decoration <u>Pattern</u> Contrasting and invisible thread | |

Prior knowledge and skills

- Key elements of the Christmas theme.
- KS1 D.T: Joining and cutting different materials.

Key questions

1. What top tips would you give for threading a needle?
2. How does your decoration relate to Christmas?
3. Which stitches have you used?
4. Why did you choose the stitches and thread that you used?

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| 1 | Learning objective | I can analyse handmade Christmas decorations. |
| | Knowledge | <ul style="list-style-type: none"> - Felt has been used for each element of the Christmas decoration. - Different stitches have been used in the designs: running, back, whip and blanket. - Colours have been purposefully chosen. - Threads can be included as ‘contrasting’ or ‘invisible’ – either used as a design feature or hidden within the design. |
| | Skills | <ul style="list-style-type: none"> - Identifying different stitches. - Analysing colour and design choices. - Thinking critically including looking for areas of improvement. |
| | Suggested activities | - Children look a selection of Christmas decorations from previous years and analyse colour choices, stitches, elements they like and areas for improvement. |
| 2 & 3 | Learning objective | I can practise different stitches. |
| | Knowledge | <ul style="list-style-type: none"> - Different stitches can be used for different purposes. - Back stitch is tighter and stronger than running stitch. - Whip stitch is used around the edge of fabrics. |
| | Skills | <ul style="list-style-type: none"> - Threading a needle. - Selecting an appropriate length of embroidery thread. - Tying a knot at the end of the thread. - Holding the thread and needle whilst stitching. - Finishing off at the end of the thread or design. - Using different stitches in order of difficulty on scrap felt: <ol style="list-style-type: none"> 1. Running stitch 2. Back stitch 3. Whip stitch - Using blanket stitch (extension). |

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| | Suggested activities | <ul style="list-style-type: none"> - Children practise threading a needle both using their fingers and a needle threader. - They then practise different stitches following guidance from teacher or tutorials. - For confident sewers, children could learn blanket stitch. |
| 4 | Learning objective | I can design Christmas decorations. |
| | Knowledge | <ul style="list-style-type: none"> - Simple designs are most effective. - Colours should be carefully chosen to add to the design. |
| | Skills | <ul style="list-style-type: none"> - Developing an achievable design, considering how each element will be made. - Considering whether 'contrasting' or 'invisible' thread should be used in different elements of the design. |
| | Suggested activities | <ul style="list-style-type: none"> - Children design 3 options for the front of their decoration and select their favourite ready for the next lesson. |
| 5, 6 & 7 | Learning objective | I can make a Christmas decoration. |
| | Knowledge | <ul style="list-style-type: none"> - Patterns are helpful to aid in the transfer of design to product. |
| | Skills | <ul style="list-style-type: none"> - Cutting two circles from felt using pattern. - Drawing a pattern for the individual elements of the Christmas decoration on paper and cutting them out e.g. star, gingerbread man etc. - Pinning paper patterns onto felt. - Cutting out individual elements of design on felt. - Adjusting cutting technique for felt depending on different scissors. - Pinning individual elements of design onto felt background. - Using running or back stitch to secure elements together. - Pinning front design onto back circle of felt. - Using whip (or blanket) stitch to secure front to back, leaving gap at the top of the design for the ribbon and stuffing. - Stuff decoration using an appropriate amount of stuffing. - Close the gap using whip (or blanket) stitch, securing a ribbon in place for hanging. |
| | Suggested activities | <ul style="list-style-type: none"> - Children create Christmas decoration using steps above. |
| 8 | Learning objective | I can evaluate my Christmas decorations according to the design criteria. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Critically evaluate the quality of design and fitness for purpose. |
| | Suggested activities | <ul style="list-style-type: none"> - Children answer evaluation questions based on what they like about their decorations including elements which were easy and more challenging, and how they might change it if they were to repeat it. |

Year 4 – Gears & Pulleys

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| Key vocabulary | | Suggested trips or workshops |
| <ul style="list-style-type: none"> Lever Pulley Gear Pivot | <ul style="list-style-type: none"> Mechanical system Force Load Effort | |
| Prior knowledge and skills | | |
| <ul style="list-style-type: none"> • Materials have both functional properties and aesthetic qualities. • Levers use different mechanisms. • Catapults function using a lever around a pivot point, relying on tension to provide the force. | | |
| Key questions | | |
| <ol style="list-style-type: none"> 1. What is a gear system and how does it work? 2. What is the difference between a lever and a pulley? | | |

| 3. Which was the most challenging K'nex model to build and why? | | |
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| 4. How did you choose which mechanical system to use in your design? | | |
| 1 | Learning objective | I can explore levers, pulleys and gears |
| | Knowledge | <ul style="list-style-type: none"> - A lever consists of a pivot, effort and load <ul style="list-style-type: none"> o Examples: see-saw, wheelbarrow, crowbar, scissors - Pulleys are a kind of wheel with a ridge that a rope or string can be threaded through <ul style="list-style-type: none"> o A single pulley changes the direction of force o If you use two pulleys together, it means you need half the force to lift. o Examples: Blinds, flags, cranes, lifts, sails - Gears are when two or more wheels with spokes or 'teeth' connect together to help a small force turn into a big force. <ul style="list-style-type: none"> o Examples: bicycles, clocks, whisks |
| | Skills | - Learning through investigation |
| | Suggested activities | <ul style="list-style-type: none"> - Pulleys: Children to use the resources at the front of the class to make their own simple pulley system. What are some challenges when making a pulley system? Can you make more than one type of pulley? - Gears: Use the resources at the back of the class to make your own gear system. What are the rules of gears? What happens as you add more gears to a system? |
| 2, 3 & 4 | Learning objective | I can make a mechanical system with gears I can make a mechanical system with levers and pulleys |
| | Knowledge | - Recap key vocabulary and knowledge from Lesson 1 |
| | Skills | <ul style="list-style-type: none"> - Interpreting multi-step diagrams - Visualising in 3-dimensional space - Understanding the different ways in which gears, levers and pulleys can be made |
| | Suggested activities | <ul style="list-style-type: none"> - Watch BBC Teach videos with real-life examples - Use K'nex Education resources: <ul style="list-style-type: none"> o Levers & Pulleys: wheelbarrow, scissors, hockey stick; harder: flag pole, balance, block & tackle, seesaw, sailboat o Gears: chainsaw, car window, crank fan, stationary bike, blender, eggbeater, phonograph |
| 5 | Learning objective | I can design my own mechanical system. |
| | Knowledge | <ul style="list-style-type: none"> - Engineers have to apply understanding of key knowledge when designing new mechanical systems. - When designing something, you have to begin with the end goal and 'reverse engineer' how to make it. |
| | Skills | <ul style="list-style-type: none"> - Applying learning from practical lessons in this topic. - Representing thinking using diagrams and explanations. - Drawing diagram representing 3D shapes. |
| | Suggested activities | Show children examples of reverse engineering process. Children design their own mechanical systems including gears, pulleys and levers. |

Year 4 – Healthy Muffins

| Key vocabulary | | Suggested trips or workshops |
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| The Eatwell Guide | Nutrition | |
| Carbohydrates | Balanced | |
| Fruits and vegetables | Vitamins | |
| Protein | Minerals | |
| Fats | Fibre | |
| Dairy | Energy | |
| Muffin | Ingredients | |
| Recipe | | |

Prior knowledge and skills

- Following instructions.
- Basic techniques for food preparation (chopping, slicing, grating).

Key questions

1. What makes up a balanced diet?
2. How are your muffins healthy?
3. What skills did you use when making your muffins?
4. How did you maintain high levels of hygiene and safety during this D.T. topic?

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| 1 | Learning objective | I can identify the elements of a healthy, balanced diet. |
| | Knowledge | <ul style="list-style-type: none"> - There are five main food groups in The Eatwell Guide. - Each group provides different nutritional benefits: <ul style="list-style-type: none"> o Carbohydrates: Energy o Fruit and Vegetables: Vitamins, minerals and fibre o Protein: Growth and muscles o Dairy: Source of calcium for teeth and bones o Fats: Energy and help the body absorb vitamins - Examples of foods from each food group. - Some foods can fit into more than one group. |
| | Skills | <ul style="list-style-type: none"> - Identifying which food group specific foods or elements of a meal fit into. - Identifying which food groups are missing from meals. |
| | Suggested activities | <ul style="list-style-type: none"> - Give children photos of meals (could include school meals) for children to identify missing food groups and explain their importance. |
| 2 | Learning objective | I can analyse the nutritional value of different muffins. |
| | Knowledge | <ul style="list-style-type: none"> - Most muffins are very sweet, high in sugar, include many ingredients and do not provide high nutritional value. - Shops have to label products with the ingredients. - Many products now have a colour-coded key on the packaging to help customers make an informed decision. - Ingredients are recorded in descending order by weight (ingredient present in the highest amount is listed first). |
| | Skills | <ul style="list-style-type: none"> - Recognising key ingredients from labels. - Identifying healthier ingredient lists. |
| | Suggested activities | <ul style="list-style-type: none"> - Ordering recipes from healthiest to least healthy. - Annotate ingredient lists to identify healthier elements. |
| 3 | Learning objective | I can plan and design a healthy muffin recipe. |
| | Knowledge | <ul style="list-style-type: none"> - In a traditional cake recipe there are key ingredients to create a batter: flour, sugar, eggs, butter (and milk). - Other ingredients will change the appearance, taste, texture and aroma of both the batter and the finished product. - In order to make healthier muffins, extra ingredients should add nutritional value to the recipe. - Common healthy additions include fresh fruit (e.g. blueberries), dried fruit (e.g. raisins), nuts (not appropriate for use at school), seeds, spices and oats. |
| | Skills | <ul style="list-style-type: none"> - Choosing complementary flavours to add to the basic recipe e.g. banana and cinnamon, blueberry and oats, vanilla and raspberry. |
| | Suggested activities | <ul style="list-style-type: none"> - Children select additional ingredients and adjust basic recipe accordingly, thinking about when different ingredients should be added. - It may work better for children to plan and make muffins in pairs. |
| 4 & 5 | Learning objective | I can make healthy muffins. |
| | Knowledge | <ul style="list-style-type: none"> - How to maintain hygiene and safety standards when preparing food. |
| | Skills | <ul style="list-style-type: none"> - Following a recipe. |

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| | | <ul style="list-style-type: none"> - Weighing ingredients. - Mixing thoroughly to ensure equal distribution of ingredients. - Chopping ingredients as required. - Dividing batter mixture equally (roughly) between cake cases. |
| | Suggested activities | <ul style="list-style-type: none"> - Children create batter, add additional ingredients and divide into cases ready for cooking. (Milk to be added as necessary at the discretion of supervising adults). |
| 6 | Learning objective | I can evaluate my product. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Evaluate own muffins in comparison to initial design. - Being self-reflective about ways to improve. - Evaluate muffin against design criteria: healthy, muffins, tasty. |
| | Suggested activities | <ul style="list-style-type: none"> - Evaluation form including a picture. |

Year 5 – Victorian Samplers (sewing)

| Key vocabulary | | Suggested trips or workshops |
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| <ul style="list-style-type: none"> Running stitch Back stitch Cross stitch Blanket stitch Needle Binca | <ul style="list-style-type: none"> Finishing off Knotting Fraying Embroidery thread Sampler | |
| Prior knowledge and skills | | |
| <ul style="list-style-type: none"> - Using running stitch, back stitch and whip stitch. - Threading a needle. - Tying knots to secure thread. - Using embroidery thread for sewing. | | |
| Key questions | | |
| <ol style="list-style-type: none"> 1. What elements of a Victorian sampler are reflected in your work? 2. What are some of the common stitches used in sewing? 3. Why did you choose the stitches that you used? 4. Why and how do you secure the thread after sewing? | | |
| 1 & 2 | Learning objective | I can use a variety of different stitches. |
| | Knowledge | <ul style="list-style-type: none"> - Different stitches have different purposes and create different patterns. - Stitching can be used functionally to join materials together but also for aesthetic purposes. - This D.T. unit will use stitching for aesthetic purposes. - Four types of stitching will be used in this unit: running, back, cross and blanket. |
| | Skills | <ul style="list-style-type: none"> - Threading a needle. - Tying a sufficiently thick knot. - Finishing off when embroidery thread is running out or you have finished the line with that thread. |
| | Suggested activities | <ul style="list-style-type: none"> - Introduce children to Victorian samplers. - Children practise different stitches on offcuts of binca in order to difficulty: <ol style="list-style-type: none"> 1. Running stitch 2. Back stitch 3. Cross stitch 4. Blanket stitch - Note: Running and back stitch have been taught in Year 4 (blanket as an extension). Cross and blanket will be taught from scratch in Year 5. |

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| 3 | Learning objective | I can design my own Victorian-style sampler. |
| | Knowledge | - Samplers typically included names, dates of birth, the alphabet or number system and aesthetically pleasing patterns/pictures. |
| | Skills | - Representing stitches using patterns and colours on photocopied binca. - Representing letters using stitches (how to create curved or diagonal lines). - Selecting appropriate colours in colouring pencils. |
| | Suggested activities | - Children design sampler including: name or initials, something personal reflecting themselves, hobbies or things that make them special, a border and patterns. They must plan to include three types of stitches. |
| 4, 5 & 6 | Learning objective | I can create my own Victorian-style sampler. |
| | Knowledge | - As per previous lessons. |
| | Skills | - Selecting appropriate colours using embroidery thread. - Threading a needle and tying a sufficiently thick knot. - Recreating design using sewing. - Finishing off to secure stitching. - Using blanket stitch to prevent fraying around the edges of the binca. |
| | Suggested activities | - Children create their own Victorian-style sampler following their plan, including at least 3 different stitches. |
| 7 | Learning objective | I can evaluate my sampler according to the design criteria. |
| | Knowledge | - |
| | Skills | - Critically evaluate the quality of design and fitness for purpose. |
| | Suggested activities | - Children answer evaluation questions based on what they like about their sampler including elements which were easy and more challenging, and how they might change it if they were to repeat it. |

Year 5 – CAMS

| Key vocabulary | | Suggested trips or workshops |
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| <u>Cam</u> <u>Follower</u> Mechanism Components Mechanical system Sanding <u>Sawing</u> | <u>Rotary</u> <u>Linear</u> Convert <u>Motion</u> G-clamp Bench block Centre of rotation Axle | |
| Prior knowledge and skills <ul style="list-style-type: none"> Materials have both functional properties and aesthetic qualities. Levers use different mechanisms. Catapults function using a lever around a pivot point, relying on tension to provide the force. Mechanical systems create movement (levers, pulleys and gears) Mechanical systems are using in real life Engineers have to apply understanding of key knowledge when designing new mechanical systems | | |
| Key questions <ol style="list-style-type: none"> What are the key components of a cam mechanism? How does the shape of a cam impact its movement? How did you saw the wood safely? | | |

| 4. How does your chosen cam mimic the movement of the animal you've used? | | |
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| 1 | Learning objective | I can understand what a cam is and how it is used in moving toys. |
| | Knowledge | <ul style="list-style-type: none"> - Cam toys use hand-powered mechanisms to create cyclical motion that animates a scene. - A cam mechanism is made up of two main components – a cam and a follower. - A cam is a rotating disk shaped to convert rotary to linear motion. - A follower is the component which follow the movement of the cam. |
| | Skills | <ul style="list-style-type: none"> - Identifying the cam and follower in a cam mechanism. |
| | Suggested activities | <ul style="list-style-type: none"> - Children explain what cams and followers are, draw and label three cam mechanisms and explain how a cam mechanism helps something to move up and down. |
| 2 | Learning objective | I can explore the impact of the shape of a cam. |
| | Knowledge | <ul style="list-style-type: none"> - The shape of a cam will impact its rotary motion and therefore the linear motion. - The centre of rotation impacts the motion. - An axle supports and turns the cam. |
| | Skills | <ul style="list-style-type: none"> - Testing different cams. - Representing the linear movement of the cam mechanism as a basic line graph. |
| | Suggested activities | <ul style="list-style-type: none"> - Children look at cam mechanisms with different shaped cam (snail, egg, circular, teardrop), draw the mechanism and then draw a basic line graph representing the linear motion. |
| 3 | Learning objective | I can design my own cam mechanism. |
| | Knowledge | <ul style="list-style-type: none"> - The shape of the cam impacts the linear motion of the toy. - The foreground and background should be decorated to suit the purpose of the toy. |
| | Skills | <ul style="list-style-type: none"> - Selecting a cam shape to mimic the movement of the chosen animal. |
| | Suggested activities | <ul style="list-style-type: none"> - Children design their cam mechanism. This could be done using online software such as Google Drawings or could be hand drawn. |
| 4, 5 & 6 | Learning objective | I can create my own cam mechanism. |
| | Knowledge | <ul style="list-style-type: none"> - The shape of the cam impacts the linear motion of the toy. - It is important to create a strong structure. - Accuracy is very important to ensure the cam has sufficient space to rotate. |
| | Skills | <ul style="list-style-type: none"> - Accurately measuring and marking the wood. - Using a G-clamp effectively to secure wood on the table for sawing. - Holding the saw at 45° and sawing the wood with the other hand. - Sanding the edges to smooth. - Drilling a hole. - Using a bench block to cut the doweling. - Gluing pieces of wood together accurately and securely. - Designing a background to suit the purpose of the toy. |
| | Suggested activities | <ul style="list-style-type: none"> - Children create cam mechanism to make a toy with linear movement. |
| 7 | Learning objective | I can evaluate my product according to the design criteria. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Critically evaluate the quality of design and fitness for purpose. |
| | Suggested activities | <ul style="list-style-type: none"> - Children answer evaluation questions based on how their toy fits the design criteria. |

Year 5 – Bread

| Key vocabulary | | Suggested trips or workshops |
|---|---|--|
| The Eatwell Guide Carbohydrates Fruits and vegetables Protein Fats Dairy Recipe Grains Fungus | Nutrition Balanced Ingredients Fibre Processed Whole foods Kneading Yeast Flour | |
| Prior knowledge and skills <ul style="list-style-type: none"> • Hygiene and safety for food preparation. • Weighing and mixing ingredients. • Choosing complementary flavours for a specific recipe. | | |
| Key questions <ol style="list-style-type: none"> 1. What is the difference between whole food and processed food? 2. How is your bread nutritionally beneficial? 3. What skills did you use when making your bread? 4. Where do the ingredients for bread come from? | | |
| 1 | Learning objective | I can explore how ingredients are used in bread. |
| | Knowledge | <ul style="list-style-type: none"> - Recap: food groups and balanced diets. - Whole foods have been processed or refined as little as possible and are free from additives or other artificial substances. - Many breads are highly processed and include a lot of ingredients which are not nutritionally beneficial. - Some ingredients are added to bread to make it more nutritionally beneficial (e.g. vitamin B12). - Fibre is very important for a healthy digestive system. |
| | Skills | <ul style="list-style-type: none"> - Identifying key ingredients in bread. - Identifying nutritionally beneficial ingredients from the labels on bread. - Comparing the fibre and carbohydrate contents of different breads. |
| | Suggested activities | <ul style="list-style-type: none"> - Annotating ingredient lists to identify key ingredients. - Ordering breads in order of nutritional benefit. - Comparing different types of bread e.g. wholemeal, white etc. - Identifying the fibre and carbohydrate content. |
| 2 | Learning objective | I can explain the source of bread ingredients. Note – this could form part of lesson 1 or 3. |
| | Knowledge | <ul style="list-style-type: none"> - Flour is ground from grains (cereals), most commonly wheat, which is grown in fields. - Yeast is a type of fungus and is a living thing. When mixed with water, it grows (through fermentation) and creates carbon dioxide. Yeast can be naturally occurring but most is now produced in factories. - Salt comes from different sources including the sea (seasalt) and mines. |
| | Skills | - |
| | Suggested activities | - |
| 3 | Learning objective | I can identify and compare breads from around the world. |
| | Knowledge | <ul style="list-style-type: none"> - Bread holds cultural and historical significance across the world. - There are many different types of bread which are often made from easily sourced, local produce. - Bread is typically made from flour, water, salt and yeast. - Taste buds and opinions differ for different people. |
| | Skills | - Tasting and describing qualities including colour, smell, texture and taste. |

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| | Suggested activities | - Give children a variety of breads to try (e.g. naan, bagel, pitta, soda, rye, brioche, focaccia). They should then identify the country it comes from and analyse qualities including colour, smell, texture and taste. |
| 4 | Learning objective | I can design a healthy bread roll. |
| | Knowledge | - There are key ingredients to create a bread roll: flour, yeast, water and salt. |
| | Skills | - Choosing additional ingredients which are nutritionally beneficial and complementary with bread (e.g. olives, cheese, seeds, spices, sundried tomatoes, herbs). - Designing an effective and achievable shape. |
| | Suggested activities | - Children select additional ingredients and adjust basic recipe accordingly, thinking about when different ingredients should be added. |
| 5 & 6 | Learning objective | I can make a healthy bread roll. |
| | Knowledge | - How to maintain hygiene and safety standards when preparing food. |
| | Skills | - Following a recipe - Kneading - Chopping (when needed) - Weighing ingredients - Shaping bread roll (plaiting, twisting etc.) |
| | Suggested activities | - Children create dough, add additional ingredients and mould into desired shape. |
| 7 | Learning objective | I can evaluate my product. |
| | Knowledge | - |
| | Skills | - Evaluate own bread roll in comparison to initial design. - Being self-reflective about ways to improve. - Evaluate roll against design criteria: healthy, bread, aesthetically pleasing, tasty. |
| | Suggested activities | - Evaluation form including a picture involving both aesthetic elements and taste. |

Year 6 – Vegetable Soup

| Key vocabulary | | Suggested trips or workshops |
|---|---|------------------------------|
| The Eatwell Guide Carbohydrates Fruits and vegetables Protein Fats Dairy Recipe Saturated fats Unsaturated fats Chopping Slicing Peeling | Nutrition Balanced Ingredients Fibre Processed Whole foods Seasonality Nutritional Value The Nutrition Pyramid Sweating Sautéing Blending | |
| Prior knowledge and skills <ul style="list-style-type: none"> • Eatwell Guide including 5 food groups • Chopping, slicing and grating • Importance of hygienic and safe food preparation • Whole and processed foods | | |

- Weighing and mixing ingredients.
- Choosing complementary flavours for a specific recipe.

Key questions

1. Why are vitamins and minerals important for a healthy diet?
2. What does seasonality mean?
3. How is your soup nutritionally beneficial?
4. What skills did you use when making your soup?

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| 1 | Learning objective | I can recognise a healthy diet and know the different food groups. |
| | Knowledge | <ul style="list-style-type: none"> - Why do we need food? - Explanation of food labelling using the traffic light system. - The difference between saturated and unsaturated fats. - Revision of Eatwell Guide from previous years. - Nutrient Pyramid provides additional information from the Eatwell Guide. |
| | Skills | <ul style="list-style-type: none"> - Linking the nutrient pyramid to the Eatwell Guide. |
| | Suggested activities | <ul style="list-style-type: none"> - Children outline the purpose/job of each nutrient. Display information around the classroom for children to find and summarise. |
| 2 | Learning objective | I can explain UK seasonality and know some products travel a long way. |
| | Knowledge | <ul style="list-style-type: none"> - There are different types of farms: arable and pastoral. - Seasonal food is fresh produce that is ready to harvest or pick at a certain time. People only eat it when it is available. It is naturally grown, is fresh and doesn't tend to travel very far from where it is produced. - This can affect taste and flavour. When you eat food that is not in season, it has either been imported or grown in a hothouse (unnatural conditions). The heaters used in these hothouses use up a lot of energy. - Food that cannot be grown locally has to be imported from other countries. This is due to the climate and conditions needed for it to be grown. - The amount of miles food has to travel to reach our shops is called food miles. Products with lower food miles are more sustainable and often cheaper because they have travelled less distance to reach our shops (less fuel, pollution and energy). - Some foods are grown locally but are heated in greenhouses to give the vegetables the conditions needed to grow. They have less food miles. |
| | Skills | <ul style="list-style-type: none"> - Identifying the seasonality of different foods. |
| | Suggested activities | <ul style="list-style-type: none"> - Children place different fruits and veg into hoops according to seasonality. - Use iPads to research chosen fruit or vegetable in more detail. |
| 3 | Learning objective | I can taste test and analyse different vegetable soups. <i>Note – Lessons 3 & 4 are taught in one afternoon.</i> |
| | Knowledge | <ul style="list-style-type: none"> - Different fruit and vegetables have different nutritional value. - Soups are often made from a variety of vegetables. |
| | Skills | <ul style="list-style-type: none"> - Analysing the taste and texture of different vegetable soups. - Predicting the ingredients. - Applying knowledge from previous lessons of nutritional value. |
| | Suggested activities | <ul style="list-style-type: none"> - Children taste 6 different vegetable soups (mixture of shop bought and homemade) and rate them on taste and guess the ingredients. Children then create nutritional score for each soup once they have been told the ingredients. |
| 4 | Learning objective | I can use research to design a healthy vegetable soup. <i>Note – Lessons 3 & 4 are taught in one afternoon.</i> |
| | Knowledge | <ul style="list-style-type: none"> - Nutritional value of ingredients. - Seasonality of vegetables. |
| | Skills | <ul style="list-style-type: none"> - Identifying flavours which complement each other. |
| | Suggested activities | <ul style="list-style-type: none"> - Children research soup recipes and design their own in a group. |

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| 5 | Learning objective | I can use a range of techniques for food preparation. <i>Note – lessons 5, 6 & 7 are part of a D.T. day.</i> |
| | Knowledge | <ul style="list-style-type: none"> - Hygiene is very important in food preparation. - Specific equipment is required for different purposes in food preparation. |
| | Skills | <ul style="list-style-type: none"> - Slicing and chopping using a sharp knife on a chopping board, using the bridge and claw cutting techniques. - Holding the item securely when cutting. - Peeling vegetables away from your body. - When used, pressing garlic using a garlic press. |
| | Suggested activities | <ul style="list-style-type: none"> - Children prepare ingredients in small groups maintaining high levels of hygiene and safety. |
| 6 | Learning objective | I can use different cooking techniques. <i>Note – lessons 5, 6 & 7 are part of a D.T. day.</i> |
| | Knowledge | <ul style="list-style-type: none"> - Different vegetables require different cooking techniques. - When sweating vegetables, no oil is required, the lid must be kept on and the heat is low. - Sautéing onions require a small amount of oil with the lid off, requires frequent stirring and helps to release the flavour. - Soup requires a liquid base (in this case, vegetable stock). |
| | Skills | <ul style="list-style-type: none"> - Sweating vegetables. - Sautéing onions. - Recognising when vegetables are soft enough. - Using the hob correctly – adjusting heat as required. - Pouring soup mixture into blender. - Using blender. - Adjusting and adding seasoning using taste testing. - Following a recipe carefully. - Measuring ingredients as required. |
| | Suggested activities | <ul style="list-style-type: none"> - Children work in small groups to produce vegetable soup. |
| 7 | Learning objective | I can promote the nutritional value of a product. <i>Note – lessons 5, 6 & 7 are part of a D.T. day.</i> |
| | Knowledge | <ul style="list-style-type: none"> - New products have to be promoted in order for people to buy them. - Different forms of advertising are used. - Advertising includes the packaging, posters and TV advertisements. |
| | Skills | <ul style="list-style-type: none"> - Recognising the nutritional value of products. - Identifying persuasive factors linked to nutrition and seasonality. |
| | Suggested activities | <ul style="list-style-type: none"> - Children produce a label, nutritional poster and video advert (on iPads) for their soup, focusing on the nutritional value and seasonality of ingredients. |
| 7 | Learning objective | I can evaluate a product. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Critically evaluate the quality of design and fitness for purpose. - Recognising what makes a good soup. - Analysing the taste and texture of the soup. |
| | Suggested activities | <ul style="list-style-type: none"> - Children answer evaluation questions based on texture, taste, appearance, nutritional value, seasonality and ease of making. |

Year 6 – WW2 Shelters

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| Key vocabulary | | Suggested trips or workshops |
| Mitre joint | CAD | |

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| <u>Framework</u> | Jelutong | |
| <u>Structure</u> | Bench block | |
| <u>Shelter</u> | G-clamp | |
| <u>Brace</u> | Vice | |
| <u>Struts</u> | Safety goggles | |
| Sandpaper | Hack saw | |
| <u>Power source</u> | <u>Switch</u> | |
| <u>Wires</u> | <u>Light bulb</u> | |

Prior knowledge and skills

- Joining wood using hot glue.
- Sawing safely and accurately.
- Measuring and marking accurately.
- Using a bench block and g-clamp.
- Creating a strong structure.

Key questions

1. What makes a strong structure?
2. How do you make a mitre joint?
3. How does the electrical system add to your design?
4. What elements of a WW2 shelter are reflected in your model?

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| 1 | Learning objective | I can describe the function and structure of a shelter and relate this to its design. |
| | Knowledge | <ul style="list-style-type: none"> - What makes a strong structure? - What shapes and materials are used to add strength to a structure? - What are shelters used for? |
| | Skills | <ul style="list-style-type: none"> - Recognising the materials used in different shelters. - Analysing the use of different shapes within structures. |
| | Suggested activities | - Children look at a range of photos of different shelters, analysing the purpose and the shapes/materials which have been used to add strength to the structure. |
| 2 | Learning objective | I can make a mitre joint. |
| | Knowledge | <ul style="list-style-type: none"> - Mitre joints are a way of joining two pieces of wood to form a right-angled joint. - This strengthens the join and structure as well as looking aesthetically neat. - Braces can be added to reinforce the joint and add additional strength to a structure, forming the strong triangular shape. |
| | Skills | <ul style="list-style-type: none"> - Sawing jelutong wood at a 45° angle to form the mitre joint. - Marking the sawing lines accurately to create a brace. |
| | Suggested activities | - Children create small mitre joint (using offcuts of wood) using skills above and including a brace. |
| 3 | Learning objective | I can design a WW2 shelter with a framework. |
| | Knowledge | - CAD is now used for the majority of 3D design in business. |
| | Skills | <ul style="list-style-type: none"> - Using Tinkercad (building on Computing unit from Term 1) to design WW2 shelter. - Designing accurately, including measurements to be used during production. - Designing using set length of jelutong (180cm – 3 pieces of 60cm length). - Applying knowledge from previous lessons to inform design. |
| | Suggested activities | - Children use Tinkercad to design their own WW2 shelter, ensuring the total length of wood is below 180cm. The roof of their structure should be removeable to reveal structure. |
| 4, 5 & 6 | Learning objective | I can create a WW2 shelter with a framework. |
| | Knowledge | <ul style="list-style-type: none"> - A strong structure requires a framework and a base. - High levels of safety are required when using equipment including saws and hot glue guns. - A bench block is used to protect the table and help straight sawing. - A G-clamp holds the bench block in place for sawing. |

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| | | <ul style="list-style-type: none"> - A vice can be used for sawing thicker pieces of wood. - A hacksaw is a single blade saw which is used to cut small pieces of wood. - Protective goggles are a crucial part of safety because they protect your eyes from getting damaged or getting anything in them. - Sandpaper can be used to smooth down rough edges. |
| | Skills | <ul style="list-style-type: none"> - Interpreting design created on Tinkercad and understanding the measurements. - Measuring and marking accurately. - Sawing safely. - Joining successfully and securely. - Sanding. |
| | Suggested activities | - Children create WW2 shelter including a framework with a shoebox. Their shelter must include a mitre joint, braces or a strut and a removeable roof. They can then add extra decorative elements to make it look realistic. |
| 7 | Learning objective | I can understand and use an electrical system in my product. |
| | Knowledge | - Simple circuits (cross-curricular knowledge from science) including a switch, power source and light. |
| | Skills | <ul style="list-style-type: none"> - Creating a simple circuit by connecting wires between a power source, light and switch. - Attaching the circuit to the shelter created in previous lesson. - Cutting wire to appropriate length. - Stripping the end of the wire for joining components. |
| | Suggested activities | - Children create simple circuit to add a light to their shelter. |
| 8 | Learning objective | I can evaluate my product according to the design criteria. |
| | Knowledge | |
| | Skills | - Critically evaluate the quality of design in comparison to the brief. |
| | Suggested activities | - Children answer evaluation questions in comparison to the design brief, parts which were challenging, learning from the unit and how they would improve it if repeated. |

Year 6 – Mobile Phone Cases (Sewing)

| Key vocabulary | | Suggested trips or workshops |
|---|---|------------------------------|
| <ul style="list-style-type: none"> Running stitch Back stitch Cross stitch Blanket stitch Chain stitch Needle Binca Seam allowance Embroidery thread | <ul style="list-style-type: none"> Pinning Joining Button hole Finishing off Knotting Fraying | |
| Prior knowledge and skills <ul style="list-style-type: none"> • Running stitch, back stitch and whip stitch. • Threading a needle, finishing off, tying knots and pinning materials. • Joining fabrics using sewing. • Converting a design into a product. • Using different stitches for different purposes. • Using a pattern or template. • Cross stitch and blanket stitch. • Using binca for sewing. • Overcoming fraying using stitching. | | |

- Using different stitches for aesthetic purposes.

Key questions

1. What are some of the common stitches used in sewing?
2. How did you choose which stitch to use for different elements of your design?
3. How can you stop a material from fraying using stitching?
4. How does your finished product meet its purpose?

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| 1 | Learning objective | I can use a variety of different stitches. |
| | Knowledge | <ul style="list-style-type: none"> - Different stitches have different purposes and create different patterns. - Stitching can be used functionally to join materials together but also for aesthetic purposes. - Five types of stitching will be used in this unit: running, back, cross, blanket and chain. |
| | Skills | <ul style="list-style-type: none"> - Threading a needle. - Tying a sufficiently thick knot. - Finishing off when embroidery thread is running out or you have finished the line with that thread. |
| | Suggested activities | <ul style="list-style-type: none"> - Introduce children to mobile phone case unit to act as a 'hook' for this unit. - Children practise different stitches on offcuts of binca in order to difficulty: <ol style="list-style-type: none"> 5. Running stitch 6. Back stitch 7. Cross stitch 8. Blanket stitch 9. Chain stitch |
| 2 & 3 | Learning objective | I can incorporate different stitches within a design. |
| | Knowledge | <ul style="list-style-type: none"> - Different stitches create different patterns. - Cross stitch creates block colour whereas other stitches create a single line. |
| | Skills | <ul style="list-style-type: none"> - Representing different stitches by creating a paper pattern. - Threading a needle and tying a sufficiently thick knot. - Creating an aesthetically pleasing design using different stitches. |
| | Suggested activities | <ul style="list-style-type: none"> - Children draw stitch patterns using colours onto photocopied binca and then create bookmark using different stitches. |
| 4 | Learning objective | I can design a purposeful product based on research. |
| | Knowledge | <ul style="list-style-type: none"> - Some designs are not achievable using simple stitch designs. |
| | Skills | <ul style="list-style-type: none"> - Applying research, personal preferences and knowledge of stitches to create a paper pattern for a mobile phone case. - Recognising achievable elements of existing designs. |
| | Suggested activities | <ul style="list-style-type: none"> - Children research existing mobile phone cases as inspiration for their own design, producing a paper pattern on binca. |
| 5 & 6 | Learning objective | I can use different stitches to reflect my design. |
| | Knowledge | <ul style="list-style-type: none"> - Different stitches have different purposes and create different patterns. - Stitching can be used functionally to join materials together but also for aesthetic purposes. - Five types of stitching will be used in this unit: running, back, cross, blanket and chain. - Recognising the need for a seam allowance around the outside of the binca. - Blanket stitch can be used around the edge of binca to prevent fraying. |
| | Skills | <ul style="list-style-type: none"> - Threading a needle. - Tying a sufficiently thick knot. - Using different types of stitches. - Positioning and sewing a button in the correct place. |
| | Suggested activities | <ul style="list-style-type: none"> - Children sew their design onto binca using a variety of stitches. They must leave 2 lines around the edge for the seam and use a blanket stitch to prevent the top edge of the binca from fraying. |
| 7 | Learning objective | I can use different stitches to join fabrics together. |

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| | Knowledge | <ul style="list-style-type: none"> - Different stitches are required to join different elements. - Stitching is done inside out to create a neat seam. - Additional material is required for the seams. |
| | Skills | <ul style="list-style-type: none"> - Cutting felt to the correct size, allowing room for a significant seam. - Pinning binca to felt inside out, checking there is sufficient room for a mobile phone. - Using a running stitch to join the binca to the felt around three edges. - Using a blanket stitch around the top edge of the felt. - Cutting a button hole in the correct location on the felt to correspond with the button sewn onto the binca. |
| | Suggested activities | <ul style="list-style-type: none"> - Children attach binca to felt (see skills outlined above) and join fabrics together. Children may wish to bring measurements of their own phone to ensure it fits in their case. |
| 8 | Learning objective | I can evaluate my product according to the design criteria. |
| | Knowledge | - |
| | Skills | <ul style="list-style-type: none"> - Critically evaluate the quality of design and fitness for purpose. |
| | Suggested activities | <ul style="list-style-type: none"> - Children answer evaluation questions based on what they like about their mobile phone case, elements which were easy and more challenging, and how they might change it if they were to repeat it. |