



# Riversdale Primary School

## DESIGN AND TECHNOLOGY PROGRESSION

| DISCIPLINARY CONCEPTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |            |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |            |                    |
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| Designing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Making | Evaluating | Cooking & Nutrition | Textiles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Structures | Mechanisms | Electrical Systems |
| GENERAL OVERVIEW EYFS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |            |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |            |                    |
| <p><u>Nursery:</u></p> <p><u>Physical Development:</u></p> <ul style="list-style-type: none"> <li>Choose the right resources to carry out their own plan.</li> <li>Use one-handed tools and equipment, for example making snips in paper with scissors.</li> <li>Use a comfortable grip with good control when holding pens and pencils.</li> </ul> <p><u>Expressive Arts &amp; Design:</u></p> <ul style="list-style-type: none"> <li>Explore different materials freely in order to develop their ideas about how to use them and what to make</li> <li>Develop their own ideas and then decide which materials to use to explore them.</li> <li>Join different materials and explore different textures</li> <li>Use drawing to represent ideas like movement or loud noises.</li> </ul> |        |            |                     | <p><u>Reception:</u></p> <p><u>Physical Development:</u></p> <ul style="list-style-type: none"> <li>Develop their fine motor skills so that they can use a range of tools competently, safely and confidently.</li> </ul> <p><u>Expressive Arts &amp; Design:</u></p> <ul style="list-style-type: none"> <li>Return to and build on their previous learning, refining ideas and developing their ability to represent them.</li> <li>Create collaboratively, sharing ideas, resources and skills.</li> </ul> <p><u>ELG Fine Motor Skills:</u></p> <ul style="list-style-type: none"> <li>Hold pencil effectively in preparation for fluent writing-using the tripod grip in almost all cases,</li> <li>Use a range of small tools including scissors, paintbrushes, and cutlery.</li> </ul> <p><u>ELG Creating with Materials:</u></p> <ul style="list-style-type: none"> <li>Safely use and explore a variety of materials, tools, techniques, experimenting with colour, design, texture, form, and function.</li> <li>Share their creations, explain the process they have used.</li> </ul> |            |            |                    |

| OVERVIEW |                                                           |          |                                                           |          |                                                 |          |
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|          | Autumn 1                                                  | Autumn 2 | Spring 1                                                  | Spring 2 | Summer 1                                        | Summer 2 |
| Year 1   | <b>Textiles</b><br>Christmas Puppets                      |          | <b>Mechanisms</b><br>Sliders & Levers                     |          | <b>Cooking &amp; Nutrition</b><br>Fruit Snacks  |          |
| Year 2   | <b>Cooking &amp; Nutrition</b><br>Picnic Pieces           |          | <b>Structures</b><br>Photo Frames (Freestanding)          |          | <b>Mechanisms</b><br>Wheels & Axles             |          |
| Year 3   | <b>Mechanisms</b><br>Pneumatics                           |          | <b>Cooking &amp; Nutrition</b><br>Oven Roasted Vegetables |          | <b>Textiles</b><br>Practical Pouches            |          |
| Year 4   | <b>Structures</b><br>Protective Product Packaging (Shell) |          | <b>Cooking &amp; Nutrition</b><br>Baking Breads           |          | <b>Electrical Systems</b><br>Light up the Night |          |
| Year 5   | <b>Mechanisms</b><br>Cam Mechanism Toys                   |          | <b>Textiles</b><br>Classy Cushions                        |          | <b>Cooking &amp; Nutrition</b><br>UK Summertime |          |
| Year 6   | <b>Structures</b><br>Playground Apparatus (Frame)         |          | <b>Cooking &amp; Nutrition</b><br>Mediterranean Foods     |          | <b>Electrical Systems</b><br>Micro:bit Control  |          |

| PROGRESSION OF DISCIPLINARY KNOWLEDGE & SKILLS |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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|                                                | EYFS                                                                                                                                                                                                      | KS1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LKS2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | UKS2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Designing</b>                               | <p>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</p> <p>Develop their own ideas and then decide which materials to use to express them.</p> | <p><b>Understanding Contexts, Users and Purposes:</b></p> <p>Work within a range of contexts, e.g. imaginary, story-based, home, school, gardens, playgrounds, and the local community.</p> <p>State what products they are designing and making.</p> <p>Say whether their products are for themselves or other users.</p> <p>Describe what their products are for.</p> <p>Say how their products will work.</p> <p>Say how they will make their products suitable for their intended users.</p> <p>Use simple design criteria to help develop their ideas.</p> <p><b>Generating, Developing, Modelling and Communicating Ideas:</b></p> <p>Generate ideas by drawing on their own experiences.</p> <p>Use knowledge of existing products to help come up with ideas.</p> <p>Develop and communicate ideas by talking and drawing.</p> <p>Model ideas by exploring materials, components and construction kits and by making templates and mock-ups.</p> <p>Use information and communication technology, where appropriate, to develop and communicate their ideas.</p> | <p><b>Understanding Contexts, Users and Purposes:</b></p> <p>Work within a range of contexts, such as the home, school, leisure, local community, culture, and enterprise.</p> <p>Describe the purpose of their products.</p> <p>Indicate the design features of their products that will appeal to intended users.</p> <p>Explain how particular parts of their products work.</p> <p>Gather information about the needs and wants of particular individuals and groups.</p> <p>Develop their own design criteria and use these to inform their idea.</p> <p><b>Generating, Developing, Modelling and Communicating Ideas:</b></p> <p>Share and clarify ideas through discussion.</p> <p>Model their ideas using prototypes and pattern pieces.</p> <p>Use annotated sketches and cross-sectional drawings to develop and communicate their ideas.</p> <p>Generate realistic ideas, focusing on the needs of the user.</p> <p>Make design decisions that take account of the availability of resources.</p> | <p><b>Understanding Contexts, Users and Purposes:</b></p> <p>Work confidently within a range of contexts, such as the home, school, leisure, local community, culture, enterprise, industry and the wider environment.</p> <p>Clearly describe the purpose of their products.</p> <p>Indicate the design features of their products that will appeal to intended users, with clear reasoning.</p> <p>Explain how particular parts of their products work.</p> <p>Carry out research, using surveys, interviews, questionnaires and web-based resources.</p> <p>Identify the needs, wants, preferences and values of particular individuals and groups.</p> <p>Develop a simple design specification to guide their thinking.</p> <p><b>Generating, Developing, Modelling and Communicating Ideas:</b></p> <p>Share and clarify ideas through discussion.</p> <p>Model their ideas using prototypes and pattern pieces.</p> <p>Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas.</p> <p>Use computer-aided design to develop and communicate their ideas.</p> <p>Generate innovative ideas, drawing on research.</p> |

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| <b>Making</b> | <p>Join different materials and explore different textures.</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> | <p><b>Planning:</b></p> <p>Plan by suggesting what to do next.</p> <p>Select from a range of tools and equipment, explaining their choices.</p> <p>Select from a range of materials and components according to their characteristics.</p> <p><b>Practical Skills &amp; Techniques:</b></p> <p>Follow procedures for safety and hygiene.</p> <p>Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components.</p> <p>Measure, mark out, cut and shape materials and components.</p> <p>Assemble, join and combine materials and components.</p> <p>Use finishing techniques, including those from art and design (where applicable).</p> | <p><b>Planning:</b></p> <p>Select tools and equipment suitable for the task.</p> <p>Begin to explain their choice of tools and equipment in relation to the skills and techniques they will be using.</p> <p>Select materials and components suitable for the task.</p> <p>Begin to explain their choice of materials and components according to functional properties and aesthetic qualities.</p> <p>Order the main stages of making.</p> <p><b>Practical Skills &amp; Techniques:</b></p> <p>Follow procedures for safety and hygiene.</p> <p>Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.</p> <p>Measure, mark out, cut and shape materials and components with some accuracy.</p> <p>Assemble, join and combine materials and components with some accuracy.</p> <p>Apply a range of finishing techniques, including those from art and design, with some accuracy.</p> | <p><b>Planning:</b></p> <p>Select tools and equipment suitable for the task.</p> <p>Confidently explain their choice of tools and equipment in relation to the skills and techniques they will be using.</p> <p>Select materials and components suitable for the task.</p> <p>Confidently explain their choice of materials and components according to functional properties and aesthetic qualities.</p> <p>Produce appropriate lists of tools, equipment and materials that they need.</p> <p>Formulate step-by-step plans as a guide to making.</p> <p><b>Practical Skills &amp; Techniques:</b></p> <p>Follow procedures for safety and hygiene.</p> <p>Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.</p> <p>Accurately measure, mark out, cut and shape materials and components.</p> <p>Accurately assemble, join and combine materials and components.</p> <p>Accurately apply a range of finishing techniques, including those from art and design.</p> <p>Use techniques that involve a number of steps.</p> |

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| <b>Evaluating</b> | Share creations, explaining the process they have used. | <p><b>Own Ideas &amp; Products:</b></p> <p>Talk about their design ideas and what they are making.</p> <p>Make simple judgements about their products and ideas against design criteria.</p> <p>Suggest how their products could be improved.</p> <p><b>Existing Products:</b></p> <p>Discuss:</p> <ul style="list-style-type: none"> <li>• what products are,</li> <li>• who products are for,</li> <li>• what products are for,</li> <li>• how products work,</li> <li>• how products are used,</li> <li>• where products might be used,</li> <li>• what materials products are made of,</li> <li>• what they like and dislike about products.</li> </ul> | <p><b>Own Ideas &amp; Products:</b></p> <p>Identify the strengths and areas for development in their ideas and products.</p> <p>Consider the views of others, including intended users, to improve their work.</p> <p>Refer to their design criteria as they design and make.</p> <p>Use their design criteria to evaluate their completed products.</p> <p><b>Existing Products:</b></p> <p>Discuss:</p> <ul style="list-style-type: none"> <li>• how well products have been designed,</li> <li>• who designed and made the products,</li> <li>• where products were designed and made,</li> <li>• when products were designed and made,</li> <li>• whether products can be recycled or reused,</li> <li>• how well products have been made,</li> <li>• why materials have been chosen,</li> <li>• what methods of construction have been used,</li> <li>• how well products work,</li> <li>• how well products achieve their purposes,</li> <li>• how well products meet user needs and wants.</li> </ul> | <p><b>Own Ideas &amp; Products:</b></p> <p>Identify the strengths and areas for development in their ideas and products, making clear links to the design criteria.</p> <p>Consider the views of others, including intended users, to improve their work, making clear links to the design criteria.</p> <p>Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make.</p> <p>Evaluate their ideas and products against their original design specification.</p> <p><b>Existing Products:</b></p> <p>Discuss:</p> <ul style="list-style-type: none"> <li>• how well products have been designed,</li> <li>• how much products cost to make,</li> <li>• how innovative products are,</li> <li>• how sustainable the materials in products are,</li> <li>• what impact products have beyond their intended purpose,</li> <li>• how well products have been made,</li> <li>• why materials have been chosen,</li> <li>• what methods of construction have been used,</li> <li>• how well products work,</li> <li>• how well products achieve their purposes,</li> <li>• how well products meet user needs and wants.</li> </ul> |

| TECHNICAL KNOWLEDGE & SKILLS   |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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|                                | EYFS                                                                                                                                                                                                                                                                                                                                                                                                                     | Year 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Year 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Year 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Year 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Cooking &amp; Nutrition</b> | <p>Begin developing a food vocabulary using taste, explaining qualities such as sweet, sour, salty.</p> <p>Begin to develop safe and hygienic practices around food, including washing hand before eating.</p> <p>Begin to identify healthy vs. less healthy foods.</p> <p>Begin to measure food items using non-statutory measures e.g. spoons, cups.</p> <p>Begin to use child safe tools for cutting soft fruits.</p> | <p>Begin to develop a sensory food vocabulary using taste, smell, texture and feel.</p> <p>Name and group familiar fruits and vegetables.</p> <p>Understand the need for a variety of fruits and vegetables in a healthy diet.</p> <p>Begin to develop an understanding of where food comes from (growing).</p> <p>Begin to recognise how food comes from the source to our plates with a focus on fruits and vegetables.</p> <p>Know that working safely and hygienically involves washing hands before and after touching food.</p> <p>Peel and cut a range of fruits and/or vegetables.</p> <p>Begin to develop safe cutting techniques using the bridge hold.</p> <p>Measure and weigh food items, non-</p> | <p>Continue to develop a sensory food vocabulary using taste, smell, texture and feel.</p> <p>Begin to develop an understanding that some foods are reared or caught.</p> <p>Continue to build on understanding of how food comes from the source to our plates, with a focus on meat.</p> <p>Expand understanding of food groups, identifying the importance of carbohydrates, proteins and fats in a healthy and balanced diet.</p> <p>Explore the eat well plate and how the different parts of a meal fit into the section of the plate.</p> <p>Working safely and hygienically by washing hands before and after touching food.</p> <p>Cut, peel, grate, slice and chop a range of ingredients.</p> | <p>Apply appropriate vocabulary when analysing the taste, texture, smell and appearance of a range of foods, with support.</p> <p>Begin to learn which foods are specifically grown, reared and caught in the UK.</p> <p>Identify that different parts of a plant can be eaten, including the root, tuber, stem, leaf, fruit and flower.</p> <p>Make healthy eating choices using the Eatwell plate when planning a dish.</p> <p>Follow instructions/recipes and begin to make appropriate adaptations.</p> <p>Join and combine a range of ingredients.</p> <p>Develop simple cooking techniques: roasting.</p> <p>Build on established safe and hygienic practices by also using aprons and tying back long hair.</p> | <p>Apply appropriate vocabulary when analysing the taste, texture, smell and appearance of a range of foods, with minimal support.</p> <p>Build on understanding of fruits and vegetables grown in the UK, making links to how the climate enables them to thrive.</p> <p>Explore food sustainability.</p> <p>Apply the full range of safe and hygienic cooking practice previously learnt.</p> <p>Understand that food poisoning/foodborne illnesses can occur if safe and hygienic practices are not followed.</p> <p>Build on prior learning to understand the importance of using different cutting boards for salad vegetables (green), cooked meat (yellow) and bread/dairy (white) to avoid cross contamination.</p> | <p>Continue to build on understanding of fruits and vegetables grown in the UK, exploring the concept of seasonality.</p> <p>Identify foods for different seasons in the UK.</p> <p>Know that foods are often processed into ingredients that can be eaten or used in cooking.</p> <p>Investigate different processing procedures.</p> <p>Continue to apply the full range of safe and hygienic cooking practice previously learnt.</p> <p>Select the correct cutting board for the selected ingredient.</p> <p>Select, design and prepare healthy and savoury foods for a particular purpose.</p> <p>Confidently follow instructions/recipes, making appropriate adaptations to suit a given purpose.</p> | <p>Exploring how UK diets have changed as a result of food imports, including the impact on seasonality.</p> <p>Understanding that some foods are imported/exported.</p> <p>Identify benefits and limitations of importing and exporting foods.</p> <p>Identify common foods imported from mainland Europe.</p> <p>Identify how foods are preserved in preparation for export.</p> <p>Recognise that foods have “miles” and that some common foods eaten have very high mileage.</p> <p>Continue to apply the full range of safe and hygienic cooking practice previously learnt.</p> <p>Select the correct cutting board for the selected ingredient.</p> <p>Select, design and prepare healthy and</p> |

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|          |                                                                                                                                                                                                           | <p>statutory measures e.g. spoons, cups.</p>                                                                                                                  | <p>Continue to develop safe cutting techniques using the bridge hold and claw grip.</p> <p>Follow simple instructions/recipes.</p> <p>Continue to measure and weigh food items, non-statutory measures e.g. spoons, cups.</p> | <p>Understand the importance of using different cutting boards for raw meat (red) and salad vegetables (green).</p> <p>Cut, peel, grate, slice and chop a range of ingredients.</p> <p>Develop more confidence with cutting/chopping techniques (bridge hold and claw grip).</p> | <p>Cut, peel, grate, slice, chop, and whisk a range of ingredients.</p> <p>Confidently apply cutting/chopping techniques (bridge hold and claw grip).</p> <p>Follow instructions/recipes, making appropriate adaptations.</p> <p>Join and combine a range of ingredients to personalise a savoury dish.</p> <p>Begin to accurately weigh and measure ingredients.</p> <p>Develop simple cooking techniques: kneading and baking.</p> <p>Recognise the importance of the use of yeast and proving in creating light textures in bread.</p> | <p>Accurately weigh and measure ingredients with minimal support.</p> <p>Cut, peel, grate, slice, chop, whisk and/or mix a range of ingredients.</p> <p>Confidently apply cutting/chopping techniques (bridge hold and claw grip).</p> <p>Develop simple cooking techniques: barbecuing/grilling.</p> | <p>savoury foods for a particular purpose.</p> <p>Confidently follow instructions/recipes, making appropriate adaptations to suit a given purpose.</p> <p>Accurately weigh and measure ingredients with minimal support.</p> <p>Cut, peel, grate, slice, chop, whisk and/or mix a range of ingredients.</p> <p>Confidently apply cutting/chopping techniques (bridge hold and claw grip).</p> <p>Develop simple cooking techniques: frying.</p> |
| Textiles | <p>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</p> <p>Develop their own ideas and then decide which materials to use to express them.</p> | <p>Begin to use appropriate vocabulary to refer to fabrics and tools.</p> <p>Know that fabrics are materials used to create things like clothes and toys.</p> |                                                                                                                                                                                                                               | <p>Continue to use appropriate vocabulary for tools, materials and their properties.</p> <p>Understand the importance of seam allowance.</p>                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Confidently use appropriate vocabulary for tools, materials and their properties.</p> <p>Create 3D products using pattern pieces and seam allowance.</p> <p>Decorate textiles appropriately often</p>                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|            | <p>Join different materials and explore different textures.</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>Share creations, explaining the process they have used.</p> <p>Make use of props and materials when role playing characters in narratives and stories.</p> | <p>Identify that common fabric types include cotton, wool, and felt.</p> <p>Understand that felt is a thick and sturdy fabric, ideal for crafting.</p> <p>Recognise that tools used in textiles include scissors and needles, which should always be handled safely.</p> <p>Cut out shapes which have been created by drawing round a template onto the fabric.</p> <p>Know that a 3D textiles product can be assembled from two identical fabric shapes.</p> <p>Join fabrics using simple methods e.g. running stitch, glue, staples.</p> <p>Decorate fabrics with attached items, e.g. buttons, beads, sequins, braids, ribbons.</p> <p>Colour fabrics using a range of techniques, e.g. fabric pens, fabric paints, printing.</p> |                                          | <p>Define the term pattern/template, including its use.</p> <p>Begin to use patterns to fabric to support with accurate cutting.</p> <p>Understand that joining fabric securely and neatly is important for the product to stay together.</p> <p>Apply a range of stitch methods, e.g. running stitch, backstitch, overstitch and/or blanket stitch.</p> <p>Sew on buttons and make loops.</p> <p>Apply appropriate decoration techniques based on prior/new learning.</p> |                                        | <p>before joining components.</p> <p>Recognise that stitches can be decorative as well as functional.</p> <p>Use a range of decorative features, e.g. eyelets, buttons, toggles, embroidery or applique.</p> <p>Pin and tack fabric pieces together, considering seam allowance.</p> <p>Join fabrics using over sewing, back stitch, blanket stitch or machine stitching (closer supervision).</p> <p>Combine different fabrics to improve functionality or aesthetics.</p> |                                        |
| Structures | Explore different materials freely, in order to develop their                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Refer to materials, tools and techniques |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Continue to use appropriate vocabulary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Confidently use appropriate vocabulary |



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|                   | <p>ideas about how to use them and what to make.</p> <p>Develop their own ideas and then decide which materials to use to express them.</p> <p>Join different materials and explore different textures.</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>Share creations, explaining the process they have used.</p> |                                                                                                                                                                                  | <p>using appropriate vocabulary.</p> <p>Know that freestanding structures stand on their own foundation or base without attachment to anything else.</p> <p>Begin to understand the concept of centre of gravity and how this impacts a structure's stability.</p> <p>Test different methods of enabling structures to remain stable.</p> <p>Make structures more stable by giving them a wide base.</p> <p>Know that the weight of the structure needs to be evenly spread on the base to make it secure.</p> <p>Join materials by selecting appropriate methods to ensure strength and stability, e.g. glue, tape etc.</p> |                                                                                                                                                           | <p>for tools, materials and their properties.</p> <p>Recognise that shell structures are hollow structures made from a thin outer layer.</p> <p>Identify that shell structures are often used for protection.</p> <p>Create simple 3D shell structures using 2D nets.</p> <p>Investigate ways of strengthening a shell structure.</p> <p>Strengthen a shell structure through laminating, corrugating or ribbing.</p> <p>Select materials to develop a chosen idea based on design decisions.</p> |                                                                                                                                         | <p>for tools, materials and their properties.</p> <p>Recognise that frame structures combine beams, columns and slabs to resist heavy loads/compression.</p> <p>Experiment with different techniques for constructing simple frame structures.</p> <p>Investigate ways of strengthening a frame structure, including struts.</p> <p>Investigate ways of strengthening joints, including gusset plates.</p> <p>Select appropriate materials to develop a chosen idea giving clear reasoning in relation to the intended purpose.</p> <p>Apply the concept of triangulation to increase rigidity of a frame structure.</p> |
| <b>Mechanisms</b> | N/A                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Refer to materials, tools and techniques using appropriate vocabulary.</p> <p>Identify simple levers and sliders in context, e.g. story books, and explain how they work.</p> | <p>Refer to materials, tools and techniques using appropriate vocabulary.</p> <p>Identify wheels and axles in context, e.g. skateboard or</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Continue to use appropriate vocabulary for tools, materials and their properties.</p> <p>Identify familiar objects that use air to make them work.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Confidently use appropriate vocabulary for tools, materials and their properties.</p> <p>Identify familiar objects that use cams</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|                    |  | <p>Use correct vocabulary to describe slider and level mechanisms and how they move, e.g. pivots, slots, etc.</p> <p>Draw simple products to show how they work using directional arrows.</p> <p>With some support make and assemble strips of cards to make sliders and lever mechanisms.</p> <p>Choose and use a given technique to make a simple slider or lever mechanism to be used in a product.</p> <p>Use tools and equipment safely, e.g. split pins and hole punch.</p> | <p>wheelbarrows, and explain how they work.</p> <p>Use correct vocabulary to describe wheels and axles and how they move, e.g. free and fixed axles.</p> <p>Explore how different size wheels and axle placement affect movement.</p> <p>Recognise that friction can impact the movement of the wheel.</p> <p>Use class construction kits with some support to construct free and/or fixed axle vehicles.</p> | <p>Describe how objects use air to make them work.</p> <p>Explain that simple pneumatic systems work by using pressurised air to create motion.</p> <p>Understand that mechanical systems have an input, process and an output.</p> <p>Know that the input is the pressure and the output is the air that results in mechanical outcome.</p> <p>Explain why pneumatic systems must have airtight connections.</p> <p>Create effective pneumatic systems using appropriate materials.</p> <p>Investigate ways of using a pneumatic system in combination with other materials to create a product.</p> |                                                                                                                                                         | <p>mechanisms to make them work.</p> <p>Explain how simple cams mechanisms work using appropriate vocabulary e.g. input and output.</p> <p>Recognise that cam mechanisms consist of a crank, follower, cam, frame and axle.</p> <p>Experiment with different cam shapes and how these affect movement.</p> <p>Create effective cam mechanisms for movement such as rotation and oscillation.</p> <p>Know that the crank uses a circular motion to create a reciprocating linear movement.</p> <p>Investigate ways of using cam mechanisms in combination with other materials to create a product.</p> |                                                                                                                                     |
| Electrical Systems |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Continue to use appropriate vocabulary for tools, materials and their properties.</p> <p>Recognise that an electric power system is a network of</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Confidently use appropriate vocabulary for tools, materials and their properties.</p> <p>Identify products that use computer</p> |

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|  |  |  |  |  | <p>components deployed to supply, transfer, and use electric power.</p> <p>Recognise that lights are controlled by a switch.</p> <p>Explore the range of different switches that can be used to control a circuit, e.g. push-to-make or push-to-break switches.</p> <p>Create a variety of switches e.g. using paperclips, coins and/or foil.</p> <p>Draw on understanding of simple electrical circuits and switches to generate design ideas.</p> <p>Build electrical systems, making secure connections, for a desired outcome.</p> |  | <p>programming to function.</p> <p>Know that microcontrollers can be used in a range of products as they are small and can be programmed to perform specific functions.</p> <p>Experiment with microcontrollers, exploring a range of inputs and outputs which can be applied to a given scenario e.g. an alarm or a game.</p> <p>Develop a sequence of steps to be used as a control programme based on a design brief.</p> <p>Build electrical systems, using control programmes, for a desired outcome.</p> |
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