



## Design and Technology

### Key Stage 1

| Unit                                                                        | <p><b>Structures</b></p>  <p>Freestanding Structures<br/>(Playground equipment)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><b>Mechanisms</b></p>  <p>Wheels and Axles<br/>(Trolley)</p> | <p><b>Food and Nutrition</b></p>  <p>Fillings for a product<br/>(Sandwich or wrap)</p> |
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| <p><b>National curriculum</b></p> <p><b>Purpose of Study &amp; Aims</b></p> | <p><b>Purpose of study</b></p> <p>Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.</p> <p><b>Aims</b></p> <p><b>The national curriculum for design and technology aims to ensure that all pupils:</b></p> <ul style="list-style-type: none"> <li>• develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world</li> <li>• build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users</li> <li>• critique, evaluate and test their ideas and products and the work of others</li> <li>• understand and apply the principles of nutrition and learn how to cook.</li> </ul> |                                                                                                                                                    |                                                                                                                                                                           |
| <p><b>National Curriculum:</b></p> <p><b>Key Stage 1</b></p>                | <p><b>Key stage 1:</b></p> <p>Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                    |                                                                                                                                                                           |

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|                                         | <p><b>Design</b></p> <ul style="list-style-type: none"> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>explore and evaluate a range of existing products</li> <li>evaluate their ideas and products against design criteria</li> <li>build structures, exploring how they can be made stronger, stiffer and more stable</li> <li>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</li> </ul> <p><b>Cooking and Nutrition</b></p> <p><b>As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>use the basic principles of a healthy and varied diet to prepare dishes</li> <li>understand where food comes from.</li> </ul> |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                       |
| <b>Title of Unit (Enquiry Question)</b> | How can we design and assemble a functional freestanding structure?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | How can we design and a wheeled (trolley) that is strong, stable and easy to move<br>for _____ (user) for _____ (purpose)?                                                                                                                                                                                                                | How to make a healthy and nutritious (sandwich/wrap/snack)                                                                                                                                                                                                                                                            |
| <b>Theme</b>                            | Structures - Free standing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Mechanism - Wheels and axles                                                                                                                                                                                                                                                                                                              | Food – Making a sandwich                                                                                                                                                                                                                                                                                              |
| <b>Knowledge</b>                        | <p><b>Lesson 1 – Evaluate and research existing products</b></p> <p>I know that structures have different purposes, are made from suitable materials, and use simple shapes and joins to stay strong and stable.</p> <p><b>Lesson 2 – Design own product</b></p> <p>I know that a product must be designed for a specific purpose and that a design needs labelled features.</p> <p><b>Lesson 3 – Focused practical tasks</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>Lesson 1 – Evaluate and research existing products</b></p> <p>I know that products are designed for specific purpose and that materials affect how a product works.</p> <p><b>Lesson 2 – Design own product</b></p> <p>I know that a product must be designed for a specific purpose and that a design needs labelled features.</p> | <p><b>Lesson 1 – Evaluate and research existing products</b></p> <p>I know that food products are made for different users and purposes, and that taste, texture, and appearance can vary.</p> <p><b>Lesson 2 – Design own product</b></p> <p>I know that a food product must be designed for a specific user and</p> |

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|               | <p>I know that different tools and materials have different uses, and can use simple finishing techniques like painting and decorating.</p> <p><b>Lesson 4 – Make own product</b><br/>I know that different materials are suitable for different parts of a product and use simple vocabulary: stronger/weaker, flexible/stiff to explain.</p> <p><b>Lesson 5 – Evaluate own product</b><br/>I know that products must work as intended and that designs can be changed or improved next time.</p>                                                                                                                                                                                                                                                                       | <p><b>Lesson 3 – Focused practical tasks</b><br/>I know that different tools and materials have different uses, understand vocabulary such as smooth/rough and stiff/flexible, and can use simple finishing techniques like colouring and decorating.</p> <p><b>Lesson 4 – Make own product</b><br/>I know that different materials are suitable for different parts of a product and use simple vocabulary: stronger/weaker, flexible/stiff to explain.</p> <p><b>Lesson 5 – Evaluate own product</b><br/>I know that products must work as intended and that designs can be changed or improved next time.</p>                                       | <p>purpose, and that a design needs labelled features.</p> <p><b>Lesson 3 – Focused practical tasks</b><br/>I know that different tools and ingredients have different uses and that simple techniques affect the finished product.</p> <p><b>Lesson 4 – Make own product</b><br/>I know how to follow simple steps to prepare food safely and understand how ingredients come together to make a final dish.</p> <p><b>Lesson 5 – Evaluate own product</b><br/>I know that a product should meet its intended purpose and that improvements can be made.</p> |
| <b>Skills</b> | <p><b>Lesson 1 – Evaluate and research existing products</b><br/>I can explore real structures, talk about their features using simple technical vocabulary, and record what they see through labelled drawings or photographs.</p> <p><b>Lesson 2 – Design own product</b><br/>I can generate and develop design ideas from experience and similar products, show them through labelled drawings or mock-ups, explain how they work, and begin planning the steps to make them.</p> <p><b>Lesson 3 – Focused practical tasks</b><br/>I can cut simple shapes accurately, use basic tools independently, join materials effectively, and select suitable tools and materials to create a structure that stands on its own.</p> <p><b>Lesson 4 – Make own product</b></p> | <p><b>Lesson 1 – Evaluate and research existing products</b><br/>I can compare products with wheels and axles, identify what works well and what could be improved, notice how materials affect them, and describe their features using simple vocabulary.</p> <p><b>Lesson 2 – Design own product</b><br/>I can generate and develop design ideas from experience and similar products, show them through labelled drawings or mock-ups, explain how they work, and begin planning the steps to make them.</p> <p><b>Lesson 3 – Focused practical tasks</b><br/>I can cut simple shapes accurately, use basic tools independently, join materials</p> | <p><b>Lesson 1 – Evaluate and research existing products</b><br/>I can taste and compare foods, talk about what I notice in taste, smells and textures, and describe simple likes, dislikes.</p> <p><b>Lesson 2 – Design own product</b><br/>I can create a simple design for my snack, label ingredients, and explain how my product will suit the user.</p> <p><b>Lesson 3 – Focused practical tasks</b><br/>I can practise safe cutting, spreading, mixing, and assembling ingredients using basic tools.</p> <p><b>Lesson 4 – Make own product</b></p>    |

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|                   | <p>I can follow a plan, select suitable tools, materials, and joining techniques, and use simple finishing methods to complete my structure</p> <p><b>Lesson 5 – Evaluate own product</b><br/>I can evaluate my ideas throughout, compare my product to my design criteria, and suggest ways to improve it.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>effectively, and select suitable tools and materials to create a product that move.</p> <p><b>Lesson 4 – Make own product</b><br/>I can follow a simple plan, use cutting and joining skills to make a wheeled product, and finish it neatly.</p> <p><b>Lesson 5 – Evaluate own product</b><br/>I can evaluate my ideas throughout, compare my product to my design criteria, and suggest ways to improve it.</p>                                                                                                                                                                                                                                                                                                                         | <p>I can follow my plan, use tools safely, prepare ingredients, and make my own food product.</p> <p><b>Lesson 5 – Evaluate own product</b></p> <p>I can taste and evaluate my product, compare it with my design, and suggest simple improvements.</p>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Vocabulary</b> | <ul style="list-style-type: none"> <li>• Freestanding structure – a structure that stands on its own foundation or base without attachment to anything else.</li> <li>• Frame structure – a structure made from thin components e.g. tent frame.</li> <li>• Shell structure – a hollow structure with a thin outer covering.</li> <li>• Stability – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied.</li> <li>• Butress – a structure added to a wall, tower or framework to make it more stable and/or reinforce it.</li> <li>• Brick bonding – arranging bricks in a wall to improve the performance of the structure or improve its appearance.</li> <li>• Mock-up – 3-D representation of a product</li> <li>• cut, fold, join, fix</li> <li>• structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved</li> </ul> | <p>Axle – a rod on which one or more wheels can rotate, either freely or be fixed to and turn with the axle.</p> <ul style="list-style-type: none"> <li>• Axle holder – the component through which an axle fits and rotates.</li> <li>• Chassis – the frame or base on which a vehicle is built. <ul style="list-style-type: none"> <li>• Friction – resistance which is encountered when two things rub together.</li> </ul> </li> <li>• Dowel – wooden rods used for making axles to hold wheels, vehicle, wheel, body, cab</li> <li>• assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism</li> <li>• names of tools, equipment and materials used</li> <li>• purpose, user, criteria, functional</li> </ul> | <ul style="list-style-type: none"> <li>• Nutrients – all the things in food that the body needs to remain healthy.</li> <li>• Pith – the soft white lining inside fruit such as oranges.</li> <li>• Sensory evaluation – subjective testing of foods where senses are used to evaluate qualities such as appearance, smell, taste, texture (mouth feel). sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard</li> <li>• ingredients (names of a variety of ingredients used)</li> <li>• names of equipment and utensils</li> <li>• grating, chopping, spreading</li> <li>• balanced diet</li> <li>• tasting, arranging</li> </ul> |
| <b>Designer</b>   | <b>TouchWood</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Ian Callum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Nadiya Hussain</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



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|              |  <p>A UK-based company that designs, manufactures, installs, and maintains bespoke natural playgrounds</p>                                                                                                                                                                                                                                                                                                                                                         | British Car Designer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Chef, Baker, author                                                                                                                                                                                                                                                                                             |
| Career Links | <p>Playground Equipment Designer</p> <p><b>Playground Equipment Designer</b></p>  <p><b>Place:</b> play equipment design studio, structural test lab</p> <p><b>Qualities:</b> safe, thoughtful, collaborative</p>                                                                                                                                                                                                                                                  | <p>Vehicle Designer</p> <p><b>Vehicle Designer</b></p>  <p><b>Place:</b> automotive design studio, prototype shop</p> <p><b>Qualities:</b> patient, persistent, safe</p>                                                                                                                                                                                                                                              | <p>Food Product Designer</p> <p><b>Food Product Designer</b></p>  <p><b>Place:</b> food development kitchen, test lab</p> <p><b>Qualities:</b> hygienic, careful, methodical</p>                                             |
| Resources    | <ul style="list-style-type: none"> <li>• photographs of various structures</li> <li>• construction kits that can be used to construct freestanding structures e.g. walls, towers, frameworks</li> <li>• paper, card, plastic sheet, paper and plastic straws, pipe cleaners</li> <li>• reclaimed materials including small containers, card boxes, cotton reels</li> <li>• string, masking tape, canary cutter</li> <li>• PVA glue, Plasticine, left/right handed scissors, hole punch, stapler</li> <li>• finishing media and materials</li> </ul> | <ul style="list-style-type: none"> <li>• selection of toy vehicles with differently fixed axles</li> <li>• card boxes, card, cotton reels, plastic tubing, dowel, clothes pegs, paper sticks/dowel, paper/plastic straws, card discs, MDF wheels, wooden wheels</li> <li>• single hole punch, card drill, cutting mat, masking tape, PVA glue, paint, thin/thick paint brushes, felt tip pens, decorative paper, double sided sticky fixers, junior hacksaw, vice, left/right handed scissors</li> </ul> | <ul style="list-style-type: none"> <li>• range of fresh fruit and vegetables</li> <li>• range of breads (e.g. white, whole grains, pita, wrap etc)</li> <li>• chopping boards, knives, peelers, graters, spoons, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities</li> </ul> |



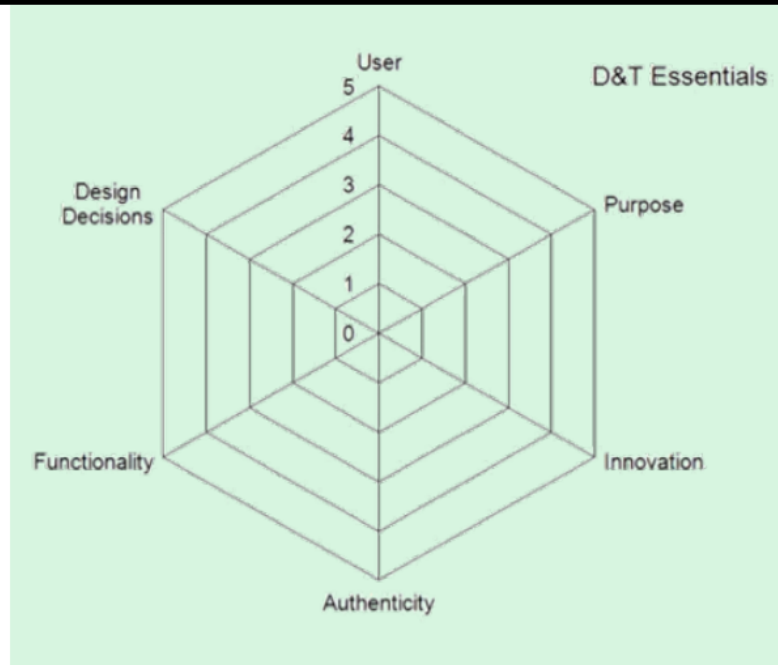
## Lower Key Stage 2 - End of Unit Assessment



### My Design Criteria

- User:
- Purpose:
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### Peer Review of My Design and Final Product



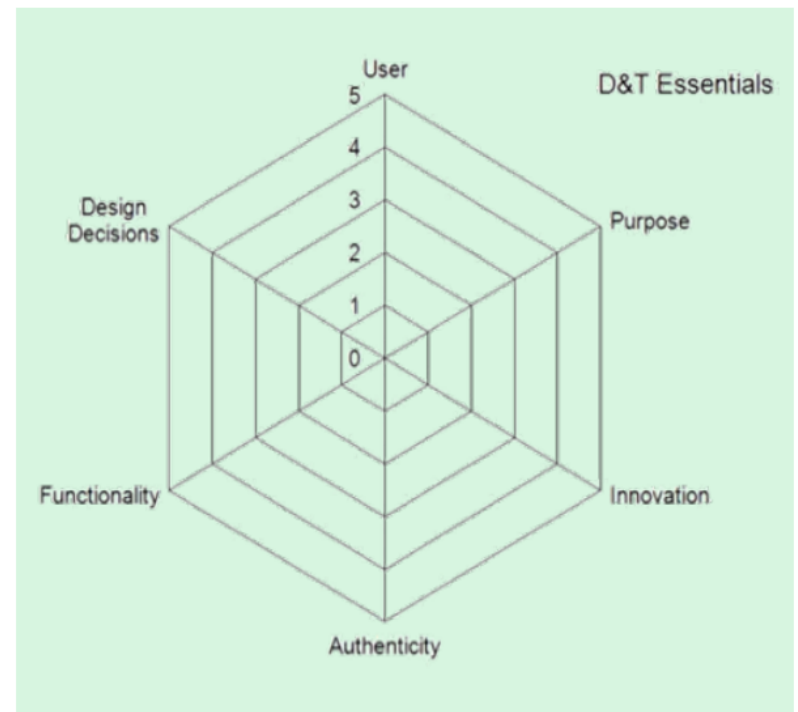
### Peer Review: Is the Design Criteria Met?

Yes ☐

No ☐

Partly ☐

## Self Evaluation of My design and Final Product



### Self Evaluation: Is the Design Criteria Met?

Yes ☐

No ☐

Partly ☐