


## Year 3: Design Technology Curriculum

### Summer 2: What makes an effective bridge? Freestanding Structures

<p><b>Overview of unit:</b>                  Within this unit, children will design, make and evaluate a truss bridge which is strong and stable enough to enable to wind up toy car to drive over.                  The children will explore different ways of strengthening card, as well as different ways of joining doweling rods to make the frame for their bridge.</p>		<p><b>Key vocabulary:</b>                  Bridge, beam, arch, truss, lamination, corrugation, ribbing, free standing, stiffen, strengthen, reinforce, triangulation, stability, shape, join, design brief, design specification, prototype, purpose, user, functional, engineers.</p>
<p><b>Prior learning relevant to the unit:</b></p> <ul style="list-style-type: none"> <li>• <u>Year 1:</u> Summer term: 'Whose home?'</li> <li>• <u>Year 2:</u> Autumn term: 'How far can a catapult throw?'</li> <li>• <u>Year 3:</u> Autumn term: 'Can a propeller power a car?'</li> </ul>		<p><b>Links to future learning:</b></p> <ul style="list-style-type: none"> <li>• <u>Year 4:</u> Summer term: 'How can we present our chocolates?'</li> <li>• <u>Year 5:</u> Summer term: 'Can you escape? What makes an effective maze?'</li> <li>• <u>Year 6:</u> Spring term: 'How might a boat be loaded and unloaded?'</li> </ul>
<p><b>Structure of unit:</b></p> <ul style="list-style-type: none"> <li>• <u>Investigative and Evaluative Activities (IEAs)</u> Approx. 3 hours</li> <li>• <u>Focussed Practical Tasks (FPTs)</u> Approx. 4 hours</li> <li>• <u>Design, Make and Evaluate Assignment (DME)</u> Approx. 4 hours</li> </ul> <p><u>Total time for unit:</u> Approx. 11 hours</p>	<p><b>How this unit fits within the National Curriculum for DT:</b></p> <p><u>Design:</u></p> <ul style="list-style-type: none"> <li>• Use research and develop design criteria to inform the design of functional products that are fit for purpose.</li> <li>• generate, develop, model and communicate their ideas through discussion and prototypes.</li> </ul> <p><u>Make:</u></p> <ul style="list-style-type: none"> <li>• Select from and use a wider range of tools and equipment to perform practical tasks.</li> <li>• Select from and use a wider range of materials and components, including construction materials, according to their functional properties.</li> </ul> <p><u>Evaluate:</u></p> <ul style="list-style-type: none"> <li>• Investigate and analyse a range of existing products.</li> <li>• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li> <li>• Understand how individuals in Design and Technology have helped shape the world.</li> </ul> <p><u>Technical knowledge:</u></p> <ul style="list-style-type: none"> <li>• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li> </ul>	<p><b>End of Year Expectations:</b></p> <p><u>Design:</u></p> <ul style="list-style-type: none"> <li>• Develop more than one design or adaptation of an initial design.</li> <li>• Propose realistic suggestions as to how they can achieve their design ideas.</li> </ul> <p><u>Make:</u></p> <ul style="list-style-type: none"> <li>• Use tools with accuracy.</li> </ul> <p><u>Evaluate:</u></p> <ul style="list-style-type: none"> <li>• Investigate similar products to the one to be made to give starting points for a design.</li> <li>• Discuss how well the finished product meets the design criteria.</li> <li>• Consider and explain how the finished product could be improved.</li> <li>• Investigate key events and individuals in design and technology.</li> </ul> <p><u>Technical Knowledge:</u></p> <ul style="list-style-type: none"> <li>• Use an increasingly appropriate technical vocabulary for tools materials and their properties.</li> <li>• Prototype a product</li> <li>• Measure and mark square section accurately to 1cm.</li> <li>• Strengthen frames with diagonal struts.</li> </ul>
<p><b>D&amp;T Essentials:</b></p> <p><u>User:</u> Children are designing and making model bridges that can be tested using a toy car.  <u>Purpose:</u> The purpose of the project is to make a model bridge that is strong enough and stable enough for a toy can to travel over.  <u>Innovation:</u> Children will explore a range of ways that can be used to strengthen card before applying this to their own bridge designs.  <u>Authenticity:</u> The models that the children make will be meaningful as they will employ the same principles of design as real bridges.  <u>Functionality:</u> The children's model bridges will need to function effectively to enable to toy car to cross.  <u>Design decisions:</u> Children will have the opportunity to make a range of design decisions including: how to join their structures, how to strengthen the card for the beam, and the design of their trusses.</p>		<p><b>Links with other learning across the curriculum:</b>                  The children have previously visited the Lune Aqueduct as part of their Geography unit during the Spring term ('What causes flooding?').                  This term, children's learning in History is focussed on the Romans, which will link to their work on bridges in DT.</p>