

## LENT TERM 2

### DESIGN AND TECHNOLOGY – YEAR 6 - MEDIUM TERM PLANNING – STRUCTURE AND MECHANISMS (FUNCTIONING BRIDGES)

<u>LESSON 1</u>	<u>LESSON 2</u>	<u>LESSON 3</u>
<p><b>Bridges and Engineers</b> <b>LEARNING INTENTION:</b> To know that bridge engineers have improved people's lives.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Identify features of design that will appeal to the intended user.</li> </ul> <p><b>Aim:</b> Critique, evaluate and test their ideas and products and the work of others.</p>	<p><b>TECHNICAL KNOWLEDGE</b> <b>LEARNING INTENTION:</b> To know that there are different methods to strengthen bridges.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Reinforce and strengthen a 3D frame.</li> </ul> <p><b>Aim:</b> 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.</p>	<p><b>TECHNICAL KNOWLEDGE</b> <b>LEARNING INTENTION:</b> To know that a triangular framework adds strength.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Reinforce and strengthen a 3D frame.</li> </ul> <p><b>Aim:</b> 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.</p>
<p><b>Key Vocabulary:</b> <b>engineer, inventions, innovations,</b> suspension.</p>	<p><b>Key Vocabulary:</b> <b>corrugated,</b> vertically, horizontally, flexibility, texture, waterproofing, <b>strengthened, framework,</b> alternately, <b>multiple, layers</b></p>	<p><b>Key Vocabulary:</b> <b>triangle, strength, distort, collapse, distribute,</b> texture, corrugated, force</p>
<p><b>Recap and Retrieval</b> <b>(Recall learning from Y2)</b></p>	<p><b>Recap and Retrieval</b></p> <ul style="list-style-type: none"> <li>Bridge structures have changed over time with innovations in design and materials.</li> </ul>	<p><b>Recap and Retrieval</b></p> <ul style="list-style-type: none"> <li>Bridge structures have changed over time with innovations in design and materials.</li> <li>Strength can be added to a framework by using multiple layers.</li> </ul>
<p><b>Key Knowledge:</b> <b>Child:</b></p> <ul style="list-style-type: none"> <li>Bridges provide a safe route over obstacles, including roads and rivers.</li> <li>They are used by pedestrians, cars, trains and pipelines.</li> <li>Bridge structures have changed over time with innovations in design and materials.</li> </ul>	<p><b>Key Knowledge:</b> <b>Child:</b></p> <ul style="list-style-type: none"> <li>Strength can be added to a framework by using multiple layers.</li> <li>Triangular shapes can be used instead of square shapes because they are more rigid.</li> </ul> <p><b>Teacher:</b></p>	<p><b>Key Knowledge:</b> <b>Child:</b></p> <ul style="list-style-type: none"> <li>Triangles are a strong shape used by engineers to add strength to a structure.</li> <li>When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse.</li> </ul> <p><b>Teacher:</b></p>

<p><b>Teacher:</b></p> <ul style="list-style-type: none"><li>• People's lives have been improved in countless ways due to new inventions and designs.</li><li>• The significance of a designer or inventor can be measured in various ways. Their work may benefit society in health, transport, communication, education, the built environment or technology.</li><li>• It may enhance culture in different areas, such as fashion, ceramics or computer games.</li><li>• Significant bridges include the Menai Bridge, Clifton Suspension Bridge and Forth Bridge.</li></ul>	<ul style="list-style-type: none"><li>• For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally.</li><li>• Frameworks can be further strengthened by adding an outer cover.</li><li>• It is important to understand the characteristics of different materials to select the most appropriate material for a purpose.</li><li>• This might include flexibility, waterproofing, texture, colour, cost and availability</li></ul>	<ul style="list-style-type: none"><li>• Frameworks can be further strengthened by adding an outer cover.</li><li>• It is important to understand the characteristics of different materials to select the most appropriate material for a purpose.</li><li>• This might include flexibility, waterproofing, texture, colour, cost and availability.</li><li>•</li></ul>
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LESSON 4	LESSON 5	LESSON 6
<p><b>DESIGN</b> <b>LEARNING INTENTION:</b> To know that a design can be communicated in a variety of ways.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Use annotated sketches, cross-sectional planning and exploded diagrams.</li> </ul> <p><b>Aim:</b> Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.</p>	<p><b>MAKE</b> <b>LEARNING INTENTION:</b> To know that a functional bridge needs to follow the design criteria.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Accurately assemble, join and combine materials /components.</li> <li>Be resourceful with practical problems.</li> </ul> <p><b>Aim:</b> 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.</p>	<p><b>EVALUATE</b> <b>LEARNING INTENTION:</b> To know that design is an iterative process.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>Test and evaluate final product; explain what would improve it and the effect different resources may have had.</li> </ul> <p><b>Aim:</b> Critique, evaluate and test their ideas and products and the work of others.</p>
<p><b>Key Vocabulary:</b> prototypes, pattern, computer-aided, appearance, <b>design, criteria, discussions, sketch, cross-sectional</b>, collaboratively.</p>	<p><b>Key Vocabulary:</b> <b>prototypes</b>, pattern, computer-aided, <b>appearance, design, criteria</b>, discussions, collaboratively, <b>strength</b></p>	<p><b>Key Vocabulary:</b> weakness, strengths, evaluate, successful, intention, <b>improvements, alterations, manufacturing.</b></p>
<p><b>Recap and Retrieval</b></p> <ul style="list-style-type: none"> <li>Bridge structures have changed over time with innovations in design and materials.</li> <li>Strength can be added to a framework by using multiple layers.</li> <li>When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse.</li> </ul>	<p><b>Recap and Retrieval</b></p> <ul style="list-style-type: none"> <li>Bridge structures have changed over time with innovations in design and materials.</li> <li>Strength can be added to a framework by using multiple layers.</li> <li>When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse.</li> <li>Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings.</li> </ul>	<p><b>Recap and Retrieval</b></p> <ul style="list-style-type: none"> <li>Bridge structures have changed over time with innovations in design and materials.</li> <li>Strength can be added to a framework by using multiple layers.</li> <li>When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse.</li> <li>Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings.</li> <li>It is important to understand the characteristics of different materials to select the most appropriate material for a purpose.</li> </ul>

<p><b>Key Knowledge:</b></p> <p><b>Child:</b></p> <ul style="list-style-type: none"> <li>• Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings.</li> <li>• They can also be exploded diagrams, prototypes, pattern pieces and computer-aided design.</li> </ul> <p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• Design criteria should cover the intended use of the product, age range targeted and final appearance.</li> </ul>	<p><b>Key Knowledge:</b></p> <p><b>Child:</b></p> <ul style="list-style-type: none"> <li>• It is important to understand the characteristics of different materials to select the most appropriate material for a purpose.</li> </ul> <p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• This might include flexibility, waterproofing, texture, colour, cost and availability.</li> </ul>	<p><b>Key Knowledge:</b></p> <p><b>Child:</b></p> <ul style="list-style-type: none"> <li>• Design is an iterative process.</li> <li>• Alterations and improvements are made continually throughout the manufacturing process.</li> </ul> <p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it.</li> </ul>
<p><b>Assessment</b></p> <p>Cumulative quiz. Retrieval practice.</p>		