LENT TERM 2
DESIGN AND TECHNOLOGY – YEAR 5/6 - MEDIUM TERM PLANNING – STRUCTURE AND MECHANISMS (FUNCTIONING BRIDGES)

LESSON 1	LESSON 2	LESSON 3
Recap and Retrieval **(Recall learning from Y2)**	**Recap and Retrieval** • Bridge structures have changed over time with innovations in design and materials.	**Recap and Retrieval** • Bridge structures have changed over time with innovations in design and materials. • Strength can be added to a framework by using multiple layers.
Design **LEARNING INTENTION:** To know that bridge engineers have improved people's lives. **Disciplinary Knowledge** **Y5:** • Use internet and questionnaires for research and design ideas. **Y6:** • Use research of user's individual needs, wants, requirements for design. **Aim:** Critique, evaluate and test their ideas and products and the work of others.	**Technical Knowledge** **LEARNING INTENTION:** To know that there are different methods to strengthen bridges. **Disciplinary Knowledge** **Y5:** • Begin to reinforce and strengthen a 3D frame. **Y6:** • Reinforce and strengthen a 3D frame. **Aim:** 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.	**Technical Knowledge** **LEARNING INTENTION:** To know that a triangular framework adds strength. **Disciplinary Knowledge** **Y5:** • Begin to reinforce and strengthen a 3D frame. **Y6:** • Reinforce and strengthen a 3D frame. **Aim:** 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.
Key Vocabulary: **engineer, inventions, innovations**, suspension.	**Key Vocabulary:** **corrugated**, vertically, horizontally, flexibility, texture, waterproofing, **strengthened, framework**, alternately, **multiple, layers**	**Key Vocabulary:** **triangle, strength, distort, collapse, distribute,** texture, corrugated, force
Key Knowledge: **Child:** • Bridges provide a safe route over obstacles, including roads and rivers.	**Key Knowledge:** **Child:** • Strength can be added to a framework by using multiple layers.	**Key Knowledge:** **Child:** • Triangles are a strong shape used by engineers to add strength to a structure.

• They are used by pedestrians, cars, trains and pipelines. • Bridge structures have changed over time with innovations in design and materials. **Teacher:** • People's lives have been improved in countless ways due to new inventions and designs. • 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. • It may enhance culture in different areas, such as fashion, ceramics or computer games. • Significant bridges include the Menai Bridge, Clifton Suspension Bridge and Forth Bridge.	• Triangular shapes can be used instead of square shapes because they are more rigid. **Teacher:** • For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. • Frameworks can be further strengthened by adding an outer cover. • It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. • This might include flexibility, waterproofing, texture, colour, cost and availability	• When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse. **Teacher:** • Frameworks can be further strengthened by adding an outer cover. • It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. • This might include flexibility, waterproofing, texture, colour, cost and availability. •

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LESSON 4	LESSON 5	LESSON 6
Recap and Retrieval • Bridge structures have changed over time with innovations in design and materials. • Strength can be added to a framework by using multiple layers. • When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse.	**Recap and Retrieval** • Bridge structures have changed over time with innovations in design and materials. • Strength can be added to a framework by using multiple layers. • When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse. • Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings.	**Recap and Retrieval** • Bridge structures have changed over time with innovations in design and materials. • Strength can be added to a framework by using multiple layers. • When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse. • Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings. • It is important to understand the characteristics of different materials to select the most appropriate material for a purpose.
Design **LEARNING INTENTION:** To know that a design can be communicated in a variety of ways. **Disciplinary Knowledge** **Y5:** • Use cross-sectional planning and annotated sketches. **Y6:** • Use annotated sketches, cross-sectional planning and exploded diagrams. **Aim:** Develop the creative, technical and practical expertise needed to perform everyday tasks	**Make** **LEARNING INTENTION:** To know that a functional bridge needs to follow the design criteria. **Disciplinary Knowledge** **Y5:** • Mainly accurately assemble, join and combine materials/components. • Begin to be resourceful with practical problems. **Y6:** • Accurately assemble, join and combine materials /components. • Be resourceful with practical problems. **Aim:**	**Evaluate** **LEARNING INTENTION:** To know that design is an iterative process. **Disciplinary Knowledge** **Y5:** • Test and evaluate final product. **Y6:** • Test and evaluate final product; explain what would improve it and the effect different resources may have had. **Aim:** Critique, evaluate and test their ideas and products and the work of others.

confidently and to participate successfully in an increasingly technological world.	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.	
Key Vocabulary: prototypes, pattern, computer-aided, appearance, **design, criteria, discussions, sketch, cross-sectional,** collaboratively.	**Key Vocabulary:** **prototypes**, pattern, computer-aided, **appearance, design, criteria**, discussions, collaboratively, **strength**	**Key Vocabulary:** weakness, strengths, evaluate, successful, intention, **improvements, alterations, manufacturing.**
Key Knowledge: **Child:** • Ideas can be communicated in a range of ways, such as discussion, annotated sketches and cross-sectional drawings. • They can also be exploded diagrams, prototypes, pattern pieces and computer-aided design. **Teacher:** • Design criteria should cover the intended use of the product, age range targeted and final appearance.	**Key Knowledge:** **Child:** • It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. **Teacher:** • This might include flexibility, waterproofing, texture, colour, cost and availability.	**Key Knowledge:** **Child:** • Design is an iterative process. • Alterations and improvements are made continually throughout the manufacturing process. **Teacher:** • Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it.
Assessment Cumulative quiz. Retrieval practice.		