**Year 4 Design and Technology Curriculum – Autumn Term**

|  |
| --- |
| **Theme: Strengthening a bridge structure**  |
| **Curriculum objectives** | **Vocabulary** | **Links across the curriculum** |
| Investigate how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.. **Designing** • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. **Making** • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making. **Evaluating**• • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.  | **Keyword** | Definition  | **Keyword** | Definition  | Science – uses of everyday materials, materials and their properties, forces and friction.• History – Who was Isambard Kingdom Brunel and why is he famous?• Art, Craft and Design – subject matter for 3D as well as 2D creative work.. |
| Arch bridge | A bridge in which the main supporting elements are arches | Swing bridge | A bridge over water that can be rotated horizontally to allow ships through. |
| Beam bridge | A simple bridge in which a horizontal beam is supported at each end. | Isambard Kingdom Brunel | British civil and mechanical engineer of great originality. He built a number of railways, tunnels, and bridges and made outstanding contributions to marine engineering. |
| Suspension bridge | A bridge in which the weight of the deck is supported by vertical cables suspended from further cables that run between towers and are anchored in abutments at each end. | Corrugated | Shaped into a series of parallel ridges and grooves so as to give added rigidity and strength: |
| Cantilever bridge | A bridge built using structures that project horizontally into space, supported on only one end (called cantilevers) | Cylinder | A solid geometrical figure with straight parallel sides and a circular or oval cross section. |
|  |  |  |  |
| **Prior knowledge:** *What specifically have pupils learned that is relevant to this unit that they are building upon?* | **Future knowledge:** *What specifically will pupils learn in the future that is relevant to this unit?* |
| Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. • Basic understanding of what structures are and how they can be made stronger, stiffer and more stable. ( Year 3) | To design and make a Viking structure. (Year 5) |
| **Lesson Sequence** | **Key Knowledge** | **Key Skills** |
| 1. To research different types of bridges (Canal and River trust – Explorers website)
 | * Know there are different types of bridges.
 | * Research skills
 |
| 1. To investigate different types of structures/ shapes and materials to create strengthened bridges.
 | * Know different thicknesses of card and different structures e.g. cylinders, corrugation, layering effects strength.
 | * Investigation skills
 |
| 1. To design a strong stable bridge to withstand a given weight (e.g 1 kg)
 | * Know which materials and structure to use to give the most stability and strength.
 | * Creative thinking.
* Drawing and labelling skills
 |
| 1. To make a strong stable bridge to withstand a given weight (e.g 1 kg)
 | * Know the equipment needed and how to use it.
 | * Construction skills
 |
| 1. To evaluate their bridge after rigorous testing.
 | * Know how effective their design was after testing.
 | * Evaluation skills.
* What went well … Even better if
 |
| **Themes and links** |
| **Themes** | **Where these are covered:** |
| **Investigate** | Lesson 1 and 2 |
| **Design** | * Lesson 3
 |
| **Make**  | * Lesson 4
 |
| **Evaluate** | * Lesson 5. How effective is the product?
 |