Y5 Building bridges	
Links made with other subjects	English
The BIG Question	To design and build a prototype for a new road bridge.
The BIG Outcome	To build a bridge with pillars and beams to span gaps.
DT objectives (link to NC)	Design • Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology Make • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Evaluate • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria Technical knowledge • Build structures, exploring how they can be made stronger, stiffer and more stable • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
Prior knowledge What prior knowledge is needed for children to be successful in this unit?	• Used different joining and cutting methods relating to paper and card • Use a range of measuring, marking-out, cutting and assembling techniques • Learnt the differences between 2D and 3D shapes • Use nets to create 3D shapes This unit builds on: Year 1 - Moving pictures, castles Year 2 – Make a wheeled toy – build a car garage Year 3 – Greenhouses Year 4 - packaging
Future learning Consider the conceptual knowledge within a subject that pupils need for future learning not just the recall of facts but the importance of concepts	This unit gives prior knowledge to: Y6 – Design and make a bird house.
DT strands	Design • Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology Make • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]

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Vocabulary/ Glossary	Bridge, built, beam, sturdy, pillar, construct, impact, cut, shape, span, support, surface, smooth, flat, deck, parapets, bigger, longer, stronger, tubular, construction, technique, foundation, gravity, generate, compression, truss, abutments, material, arch, suspension.
Knowledge (see italics for knowledge to remember)	The knowledge that children will learn and remember: *1. Investigate and analyse a range of existing products.* • Investigate and look at early bridges – beams and fallen tree, were used to span gaps. More • What modern materials might be used to make beams and pillars? • Why do you think that other materials such as wood might not be so good for spanning large distances, or for building bridges crossing water? • Explain that today we will be exploring the effectiveness of arches of different shapes and sizes in spreading the load on bridges. • Investigate and explore the effectiveness of different pillar or beam designs. *2. Generate, develop, model and communicate their ideas through discussion and annotated sketches*. • Design and make suspension bridge models. 3. *Use a range of tools and equipment to perform practical tasks accurately.* • Before designing a bridge that will solve the power station's problem, we need to write design criteria. • What must the bridge design do? • Which will you choose for your bridge design? • Show what materials and tools may be used in the construction of the prototype. • Write a design criteria then design and build a prototype bridge according to those criteria. 4. Select and use tools suitable for the task, explaining their choices, to cut, shape and join paper and card. • Gather all of the equipment and materials that they will need. Use simple finishing techniques suitable for the product they are creating. *6. Know and explain how to create a stable structure* (children to think and talk through how their structure stands and what holds it together.)

	7. Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets the design criteria. • How can we test to see if a prototype bridge design is any good? The following slide explains that prototypes can be analysed by answering • How will you test your prototype bridge? Children are to discuss their ideas with reference to their design criteria. • Analyse and evaluate our prototype bridge designs, taking account of the views of others.
SEND expectations	
Resources	*Paper, card, scissors, glue, sticky tape, sets of weights, toy cars, Art straws and sticky tape; sets of weights; toy cars; K'NEX, Meccano or similar construction kits, Card, paper, sets of weights, rulers, plasticine, modelling materials (clay/plasticine/play dough/ polystyrene/sponge)*