



ALEC REED ACADEMY
PROUD TO LEARN

Year 5 DT Stable Structures Bridges - Knowledge Organiser



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To investigate stable structures

To explore how pillars and beams can be used to explore stable structures

★ Star Vocabulary

Structures

Frame Structures

Bridge

Rigid

Beam

Column

lab

Joints

Foundations

Triangulation

Bracing

Horizontal

Diagonal

Vertical

Frame structures

Frame structures are rigid support structures that use beams, columns and slabs to hold large forces of gravity and weight.

Frame structures give shape and are useful for support & weight bearing. Frame structures have joints which are formed according to the design requirements and materials being used.

Some examples of man-made objects that use frame structures are houses, skyscrapers, bridges, scaffolding, tables and roller coasters.



The system of beams and columns in a frame structure can be further strengthened through the use of other features e.g. **Triangulation** will help to make your structure stronger. This is important when you are considering how to construct your bridge when creating stable joints.



Key Skills – How do I build a strong, stable and secure structure?

Prior Learning

Remember a wider base can help a structure to be more secure. Frames should be able to stand on their own, providing a skeleton structure.

Key points

- Consider the most appropriate materials and properties for your frame

Evaluating

How well does your structure work?
 How did you make your frame structure strong and rigid?
 Which materials did you use and why?
 How does your bridge look?
 Did your bridge stay standing?

Tower Bridge

It was built between 1886-1894
 The bridge crosses the River Thames
 The bridge is 800 feet in length
 It took thousands of stone and brick to build it

Example bridges



Sydney Harbour Bridge

It measures 143 m (440) from top to water level
 It is double hinged with reinforced concrete pylons

Research different bridges and their structures and designs.

Design a bridge, and the materials you will use

Build your bridge using your materials

Test your bridge out?
Can it hold an object?

Evaluate your bridge.
Would you change your design?

Timeline