

Design Brief

Design, make and evaluate a bridge that can successfully support an object.

Key Skills

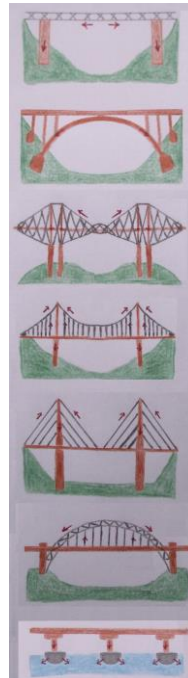
- Create a bird's eye view sketch to show the plan and layout of a bridge.
- Sketch a design from different viewpoints.
- Consider the strengths of a structure and how to improve it, using different types of truss supports.
- Use an example of triangulation to strengthen and support the bridge.
- Consider the materials needed for bridge building.

What I Should Already Know

- Materials can be joined in different ways for example using glue, sticky tape. Different joins have different effects.
- Joints must be tight ensuring they don't move.
- How to use some tools safely for example, scissors, saws.
- Measure, mark out, cut, shape and score materials/ components with some accuracy.
- How to choose tools and materials that are appropriate to the task.

Key Vocabulary

span	The full extent of something from end to end; the amount of space that something covers.
cantilever	A long projecting beam or girder fixed at only one end, used in bridge construction.
suspension	To be supported from above.
Beam Bridge	Beam Bridge is a common type of bridge which is held by the supports at the ends.
structure	A building or other object constructed from several parts.
triangulation	This distributes the weight of any vehicle or pedestrian crossing the bridge. The weight is distributed through all the members and so the bridge can cope with large weights.



Key Information

- Beam bridges are the simplest structural forms for bridge spans supported by a pier at each end.
- A truss bridge is a bridge with its load-bearing structures composed of a series of wooden or metal triangles, known as trusses.
- A cantilever bridge is a bridge built using cantilevers, structures that project horizontally into space, supported on only one end.
- An arch bridge is a bridge with abutments at each end shaped as a curved arch.
- A suspension bridge is a type of bridge in which the deck is hung below suspension cables on vertical suspenders.
- A cable-stayed bridge has one or more towers from which cables support the bridge deck.

Links to other Learning

- History - Victorians and Isambard Kingdom Brunel
- English - Biography of Isambard Kingdom Brunel
- Science - Forces, materials
- D & T - structures - all year groups

Key Questions

- Appearance/aesthetics - how will it look? How might your design use some of Brunel's ideas? What style of bridge might you take inspiration from?
- Cost - how would the resources be acquired for building your bridge?
- Customer - who might use your bridge, will it be for trains, cars or pedestrians?
- Environment - will you use sustainable materials?
- Size - how big or small will it be?
- Safety - how will you make it safe to use? How will you test if your bridge is sturdy enough to support an object?
- Function/purpose - how will your bridge hold an object?
- Materials - what materials will you use?
- Manufacture - how will you make and design it? What steps are required to create a successful bridge?

