

Inquiry question: How does the weather affect humans?

D and T unit: Bridges and strength

Strand: Structures

What children will need to already know to access this unit:

Different materials have differing properties.
Materials can be added to a structure to strengthen and stiffen the structure.

Why is this unit being taught in this term and links to previous learning.

Links to inquiry question

Links to previous learning in Picasso – who owns a country? or Do we need boundaries?

Links to future learning creating moon buggies, using the skills of measuring, cutting, strengthening

Key vocabulary/glossary of terms:

reinforce	to strengthen by adding more material for support
tension	the act of straining or stretching
torsion	the state of being twisted
bending	become curved or angular
shear	force that makes one surface of a substance move over another parallel
force	A force is a push or a pull on an object
strength	state of being physically strong
piers	a support for a bridge
abutments	substructure at the ends of a bridge span or dam
cantilever	A cantilever is a rigid structural element, such as a beam or a plate, anchored at only one end to a (usually vertical) support
beam	An arch bridge is a bridge with abutments at each end shaped as a curved arch
truss	A truss bridge is a bridge which is supported, strengthened, or stiffened by a framework of beams
arch	An arch bridge is a bridge with abutments at each end shaped as a curved arch
suspension	is a bridge that consists of two pairs of pillars, one on either end of the span, with two or more cables slung between them.
Cable-stay	a bridge that has one or more columns (called towers or pylons), with cables supporting the bridge deck
Bridge deck	the surface of a bridge
brace	something that adds strength or supports
compression	a force that squeezes something together
Civil engineer	Someone who designs bridges.

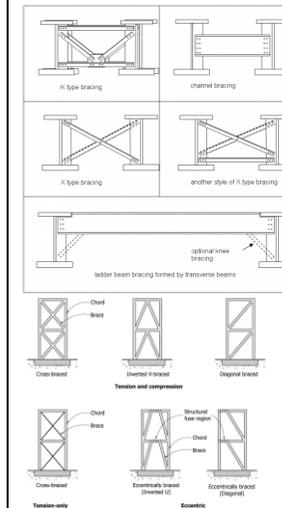
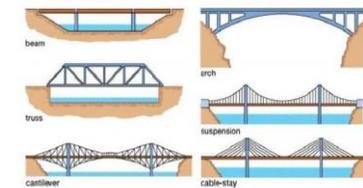
What will children know by the end of this unit:

- A civil engineer designs and builds bridges
- Why bridges are designed differently
- What makes a bridge strong/how bridges cope with strong winds
- There are six basic bridge forms: the **beam**, the **truss**, the **arch**, the **suspension**, the **cantilever**, and the **cable-stay**

What children will be able to do by the end of this unit:

- Design and make a bridge to withstand strong winds.
- Experiment with materials of different strengths
- Discuss and explain structures
- Show and explain how to measure, cut, mark, join, finish different materials.
- Evaluate their bridge according to its strength

Images



Teacher Notes

<https://www.stem.org.uk/resources/elibrary/resource/25329/bridges-and-structures#&gid=undefined&pid=2>

<https://www.tes.com/teaching-resource/bridges-6016590>

<https://www.youtube.com/watch?v=oVOnRPefcno>

The core structure of the **bridge** determines how it distributes the internal forces of tension, compression, torsion, bending, and shear. While all **bridges** need to handle all those forces at all times, various **types of bridges** will dedicate more of **their** capacity to better handle specific **types** of forces.

