

Bridges

Key Concepts:



Design
Make
Evaluate

Key Vocabulary

Pulleys A pulley is a type of wheel that has an inner groove in its circumference. When a rope, cable or belt runs along the groove, objects can be moved and lifted with far less effort. It helps to lift heavy objects because the effort is spread between the pulley and your hands.

Gears A gear is a special wheel that has parts called teeth around its circumference. These teeth interlock with the teeth of another gear, belt or chain. When two or more gears are connected they transfer motion and power from one gear to another.

Mechanism A system of parts working together in a machine

Computer aided With the help of a computer

Prototype A first or preliminary version created from which other forms are then developed

Pulley



Gear



What is a complex structure?

A structure is a 3D shape made from different materials and parts.

Some can be simple to build, such as a wall. Others can be complex, or harder to build, such as a bridge or a building.

The strength of a structure can be affected by the materials it is made from and how its parts are connected together and supported.

TYPES OF BRIDGES

arch bridge



tied arch bridge



cantilever bridge



truss bridge



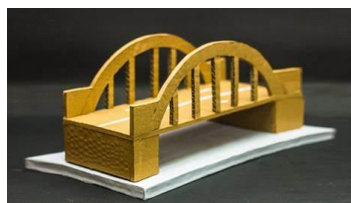
beam bridge



suspension bridge



cable-stayed bridge



Do more:
Research more:
www.bbc.co.uk/bitesize/articles/zwn2s82#zjsmfdm

Strengthening techniques

Find out about these different techniques that can be used to strengthen a structure.

Triangulation

Triangles are the strongest shape. They hold their shape when weight is applied because the weight is spread downwards along their sides.

In complex structures, materials are often arranged into triangles – this is called triangulation.

This helps make a structure strong enough to support a heavy weight or to be built on a large scale.



Trusses

A truss is a frame structure made with triangles. Each triangle has beams that are connected and joined at the corners.

The beams work together and spread the load evenly across the whole structure, supporting the load and staying rigid and strong.

This lets truss structures carry heavy weight or reach across long distances.



Beams and columns

A roof needs to hold a lot of weight. It rests on columns and beams. Beams are pieces of material arranged horizontally. Columns are pieces of material that are arranged vertically.

Rain, wind and snow can add heavy weight to a house roof, so columns and beams are used to help evenly spread the load and remain strong.

