



Design and Technology Knowledge Organiser

Year 5: Spring Term – Frame Structures

Bridges

Design, make and evaluate a prototype bridge (to scale) for pedestrians, cyclists and cars to cross over a river safely.

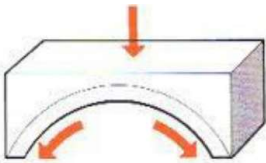


Key Knowledge

Learn this information

Four Main Types of Bridge Construction:

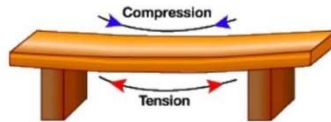
Arch Bridge:



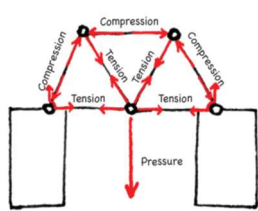
These bridges rely on the force of compression to work effectively. They have a curved design and the load is pushed along the curve of the arch to the supports on each end (the abutments).

Beam Bridge:

When a load pushes down on the beam, the beam bends. Its top edge is pushed together and shortens (it is compressed). This causes the bottom edge to be pulled apart and lengthen (tension is created).



Truss Bridge:



This is a type of bridge whose main element is a **truss** which is a structure of connected elements that form triangular units. Truss is used because it is a very rigid structure and it transfers the load from a single point to a much wider area.

Suspension Bridge:

The main cables hang between two or more towers. Smaller cables hang down from the curving main cables. The smaller cables hold up the roadway. Suspension bridges can span longer distances than any other type of modern bridge.



Key Skills

Practise and perform these skills

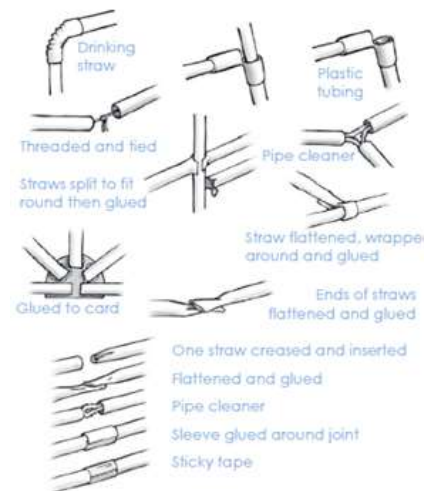
Techniques for building frame structures:

Roll Paper:

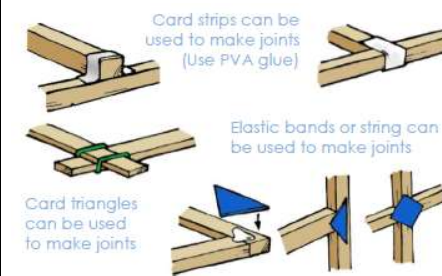
Roll paper to make tubes for construction.



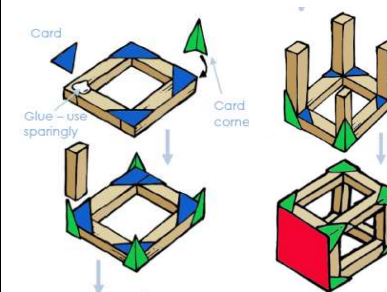
Joining Straws:



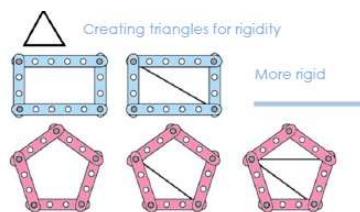
Joining Thin Sectioned Pieces of Wood:



Using Square Section Wood:



Using triangulation:



Key Vocabulary

Understand these key words

Vocabulary	Definition
Bridge	A structure across a river, road, or other obstacle
Compression	The application of pressure to squeeze an object.
Diagonal	A straight line that goes from one corner to another in a shape.
Forces	Forces make things move and stop moving.
Frame Structure	A structure made from thin components e.g. a tent frame.
Horizontal	A line that is parallel to the ground.
Span (beam)	The distance between two bridge supports
Strut	A part of a structure under compression.
Support	Bears the weight of something or keeps it upright.
Suspension	Supported by an attachment from above.
Tension	A force pulling on a material or structure
Triangulation	The use of triangular shapes to strengthen a structure.
Vertical	A line that is at a right angle to the ground.