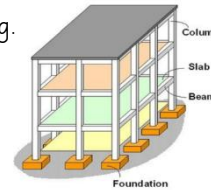


# Year 5 & 6 Structure - Frame

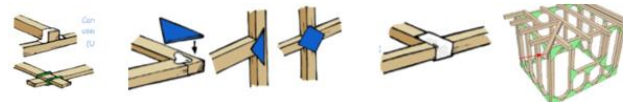
Frame Structures are rigid support structures, which use beams, columns and slabs to withstand large forces of gravity and weight. Frame structures give shape, and are useful for support and weight bearing. Unlike shell structures, frame structures have joints, which are formed according to the design requirements and materials being used. Some examples of man-made frame structures are buildings, bridges, scaffolding, gazebos and even roller coasters.



## Key Vocabulary

|                    |   |
|--------------------|---|
| structural members | the different parts, which are joined together to make a frame's structure e.g. column, beams, pillars, arches etc. |
| load               | the amount of weight a structure has to carry   |
| column             | vertical structural members   |
| beam               | a length of sturdy material that has been cut and shaped to span a horizontal gap or support a floor or roof        |
| strut              | a part of a structure under compression   |
| tension            | a force pulling in a material or structure  |
| triangulation      | the use of triangular shapes to strengthen a structure  |
| stability          | the condition or quality of being stable - fixed, firm or steady in position  |

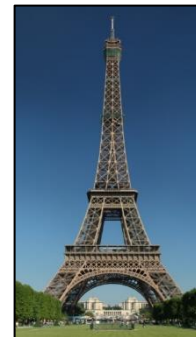
When using wood, PVA glue is most appropriate. Joints should be securely clamped together to allow for drying time. Card strips can be used to create secure joints. Card triangles can be used to create secure corner joints.



## Examples of structures:

Name: The Eiffel Tower  
Location: Paris, France  
Height: 324m  
Built in: 1889

Purpose: Observation/ Broadcasting Tower  
Materials: Wrought Iron

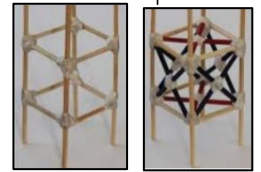


Name: Gazebos/ Tents  
Purpose: Shelter/ Temporary Habiting Space  
Materials: Wood, iron or aluminum & canvass



When building your structure, it is important to remember that a wider base can help a structure to be more secure. Frames should be able to stand on their own, providing a 'skeleton structure.' Materials used will need to be tough, malleable, and strong.

Triangulation can help to make structures stronger. This is important to consider when creating stable joints. Triangulation is also important when bracing. When force is applied to one point on the triangle, the pressure is shared amongst the other two points, which provide a secure wide base. Using bracing, you can create triangular shapes, which can therefore make your structure more rigid from different angles.



Triangulated bracing adds to rigidity.

A truss is made up of several beams connected together in different ways. Using triangulation helps to make the structure stronger. When force is applied to one point on the triangle, the pressure is shared amongst the other two points, which provides a secure, wide base. This helps to make the roof nice and strong.

