A bridge is a structure built to span a valley, road, railroad track, river, body of water, or any other physical obstacle.

A wooden bridge used to cross over a river
The first bridges made by humans were probably spans of wooden logs or planks and eventually stones, using a simple support and crossbeam arrangement.
Classification of bridges by use

A bridge can be designed for

- Trains,
- Road traffic,
- Pedestrian,
- A pipeline,
- Barge traffic,
- An aqueduct
Bridge for trains......
Bridge for pedestrians...
Bridge for trains + pedestrians……

A separate Footbridge (in blue) is suspended under the deck of the light rail bridge.
Bridge for road traffic......
A suspension pipeline bridge carrying natural gas across a river
More pipeline bridges......
Bridge for barge.......
Aquaduct......
Classification of bridges by structural system

- beam bridges,
- cantilever bridges,
- arch bridges,
- truss bridges,
- suspension bridges,
- cable-stayed bridges
Beam Bridge

- is similar to the log bridge,
- is now made from steel 'I' beams, box girders, reinforced concrete, or post-tensioned concrete.
- is frequently used in pedestrian bridges and for highway overpasses.
- is in structural terms the simplest of the many bridge types.
- consist of one or more horizontal beams with 2 supports usually on either end.
Beam Bridge
Beam Bridge
**Cantilever bridge**

- is a bridge built using cantilevers: structures that project horizontally into space, supported on only one end.
- A simple cantilever span is formed by two cantilever arms extending from opposite sides of the obstacle to be crossed, meeting at the center
Cantilever Bridge
Cantilever Bridge
Cantilever Bridge
Arch bridge

An arch bridge is a semicircular structure with abutments on each end. The design of the arch, the semicircle, naturally diverts the weight from the bridge deck to the abutments.
Types of Arch Bridges

- Hingless arch bridge
- Two-hinged arch bridge
- Three-hinged arch bridge
- Tied arch bridge
Arch Bridge
Arch Bridge

You may need to use bridges for unusual purposes....!
Arch Bridge

*First metal bridge was constructed in the form of an arch.*
Arch Bridge
Arch Bridge
Arch Bridge
Arch Bridge
Arch Bridge
Arch Bridge
Arch Bridge opening......
Arch Bridge
Truss bridge

- A truss bridge is a bridge composed of connected elements (typically straight) which may be subjected to tension, compression, or sometimes both in response to dynamic loads.
- Truss bridges are one of the oldest types of modern bridges.
- Truss type of bridge structure has a fairly simple design and is particularly cheap to construct owing to its efficient use of materials.
There are several types of truss bridges such as:

- Baltimore truss
- Bollman truss
- Bowstring arch truss (tied arch)
- Cantilevered truss
- Fink truss
- Howe truss
- Lenticular truss
- Pratt truss
- Warren (non-polar) truss
Truss bridge
Deck truss bridge
Ballman type truss bridge
Bowstring type truss bridge
Brown type truss bridge

This type of truss is particularly suited for timber structures that use steel rods as tension members.
Howe type truss bridge

[Diagram of Howe type truss bridge]
Pratt type truss bridge
(The opposite of Howe type truss)
Pratt type truss bridge
Warren type (non-polar) truss bridge
Truss bridge over Missisipi River
35W Bridge over Mississippi River collapsed ...!
Truss bridge
Suspension Bridges

A suspension bridge is a type of bridge where the main load-carrying elements are hung from suspension cables. Suspension bridges have two tall towers through which the cables are strung.
Suspension bridge
Suspension bridge
Suspension bridge
Suspension bridge
Suspension bridge
Suspension bridge
Suspension bridge
Construction of a suspension bridge

TOWERS
Construction of a suspension bridge

Prefabricated steel deck units
Construction of a suspension bridge

Prefabricated steel deck units lifted up by steel cables and assembled to form the platform...
Construction of a suspension bridge

- Set of wire ropes are suspended above the walkway.
- Traveler that has wheels riding on top of the cables.
- Temporary walkway.
Construction of a suspension bridge

Traveler that has wheels riding on top of the cables
Construction of a suspension bridge

Saddles to carry the suspender cables are clamped to the main cables.
Construction of a suspension bridge

Saddles to carry the suspender cables are clamped to the main cables.
Construction of a suspension bridge

Suspension cable
Construction of a suspension bridge

Suspension cable
Cable stayed bridges

A cable-stayed bridge is a bridge that consists of one or more columns (normally referred to as towers or pylons), with cables supporting the bridge deck.
There are two major classes of cable-stayed bridges, differentiated by how the cables are connected to the tower(s).

- In a harp design, the cables are made nearly parallel.
- In a fan design, the cables all connect to or pass over the top of the tower.
Cable stayed bridge
Cable stayed bridge
Cable stayed bridge; Fan type
Cable stayed bridge
Cable stayed bridge
Cable stayed bridge
Cable stayed bridge