

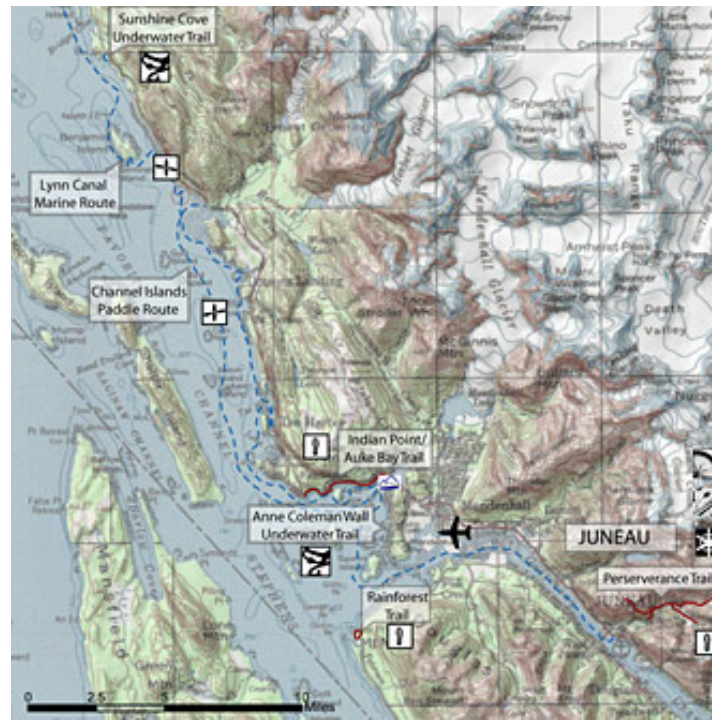
# Bridges

Parts | Purposes | Complexities

# Why bridges?









東海道  
名所

富士三十八里 東海道  
金谷第二





諸名橋奇覽 附の巻  
おあはれなす

前北奇の事





諸名橋奇覽  
はろは

承正奇為一筆





富嶽三十六景  
深川  
万年橋下

北斎 画





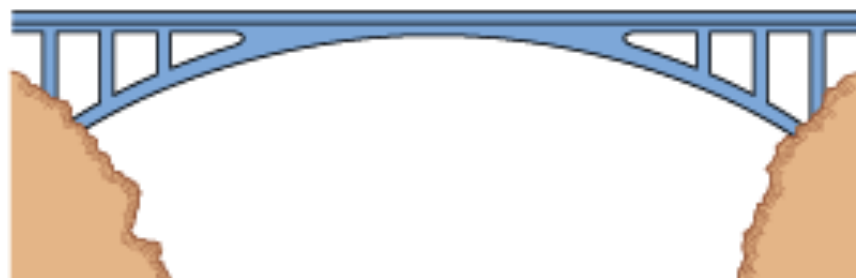
beam



truss



cantilever



arch



suspension



cable-stay



# Parts | Purposes | Complexities

## BRIDGE TYPES

The I-35W bridge that collapsed Wednesday in Minneapolis was designed as a “non-redundant” truss structure. Non-redundant bridges require less material and are cheaper to build but have no other pathways for loads to be disbursed in the event of a failure. That design has caused problems

with some other bridges, including the Silver Bridge that collapsed into the Ohio River in 1967 at the height of rush hour, carrying 31 vehicles and 46 people with it. Experts say greater redundancy could prevent a progressive collapse of a bridge.



### GIRDER BRIDGE

A girder or beam bridge is arguably the most basic bridge. A log across a creek is an example of a girder bridge in its simplest form. Modern steel girder bridges often use I-beams or box girders in their construction.

**EXAMPLE:** The 2,165 foot Poplar Street Bridge.



### TRUSS BRIDGE

The truss is a simple skeletal structure. In theory, the individual parts of a simple truss are only subject to tension and compression forces but not bending forces. Trusses are made up of small beams that when put together can support large amounts of weight and also span great distances.

**EXAMPLE:** The Old Chain of Rocks Bridge is a one-mile-long truss bridge with a dramatic joint in the center.



### ARCH BRIDGE

The second oldest bridge type, the arch doesn't require piers in the center. Arches use a curved structure. This provides high resistance to bending forces. Arches can only be used where the ground or foundation is solid and stable.

**EXAMPLE:** The Eads Bridge has a three-arch span that totals 1,647 feet.



### CANTILEVER BRIDGE

A cantilever bridge is a modified form of beam bridge. The support is in the middle of a span, not the end. The advantage to a cantilever bridge is its ability to span wide spaces without the need of extensive and expensive support while under construction.

**EXAMPLE:** The Greater New Orleans Bridge over the Mississippi River.



### CABLE-STAYED BRIDGE

A typical cable-stayed bridge is a continuous girder with one or more towers erected above piers in the middle of the span. Cables stretch down diagonally (usually to both sides) and support the girder from the towers.

**EXAMPLE:** The Clark Bridge crossing the Mississippi going to Alton.



### SUSPENSION BRIDGE

The suspension bridge allows for the longest spans. A typical suspension bridge is a continuous girder with one or more towers erected above piers in the middle of the span.

**EXAMPLE:** The Golden Gate bridge in San Francisco.













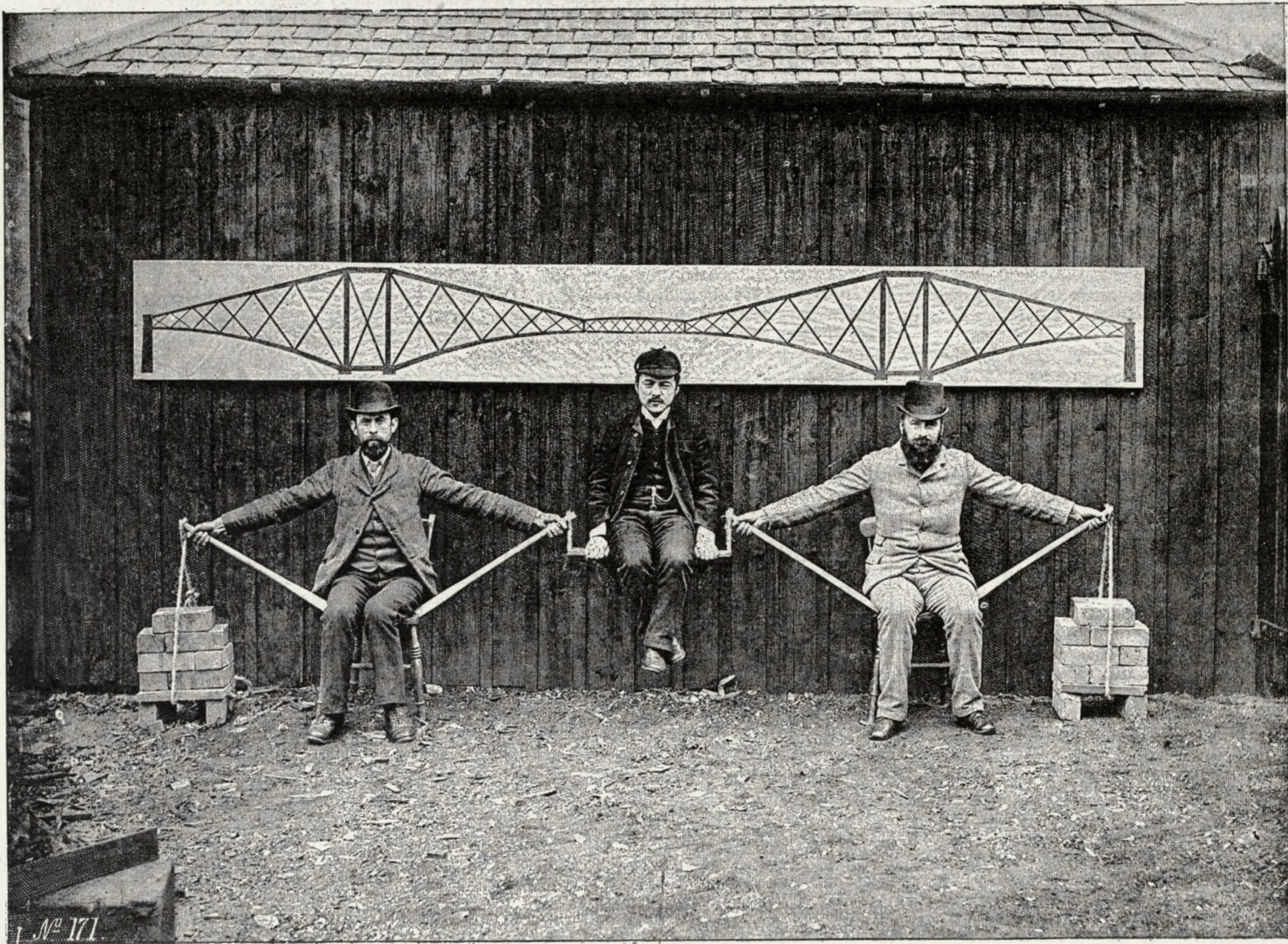


FIG. 5A. LIVING MODEL ILLUSTRATING PRINCIPLE OF THE FORTH BRIDGE.













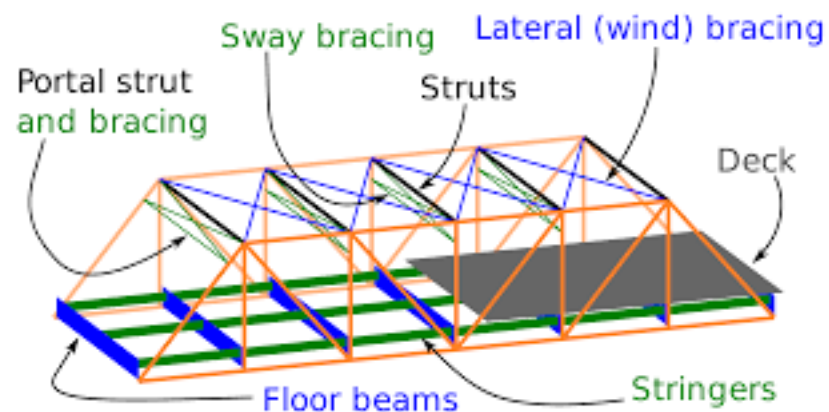
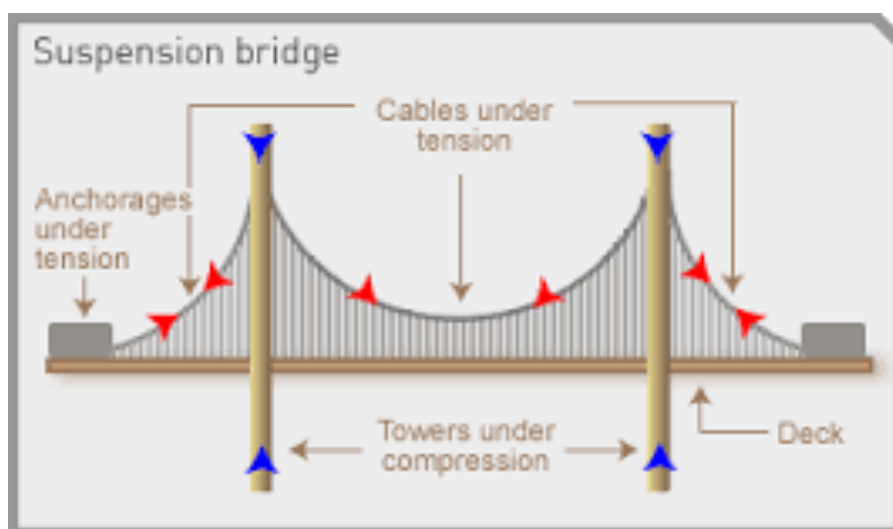








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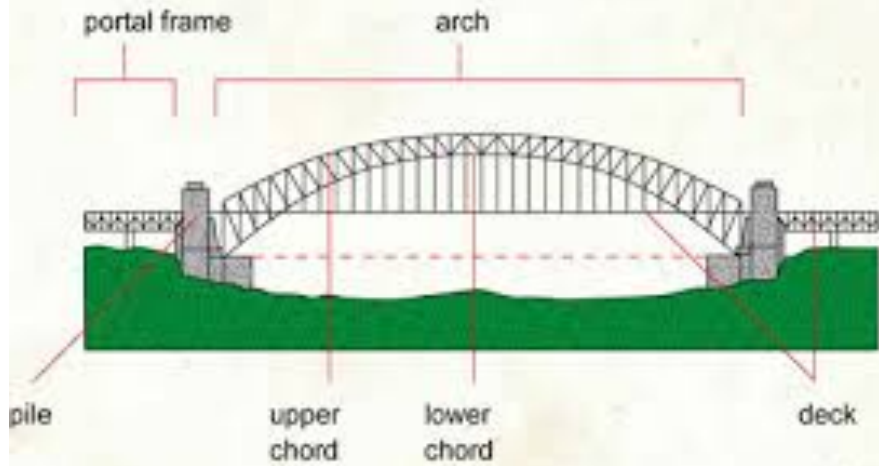




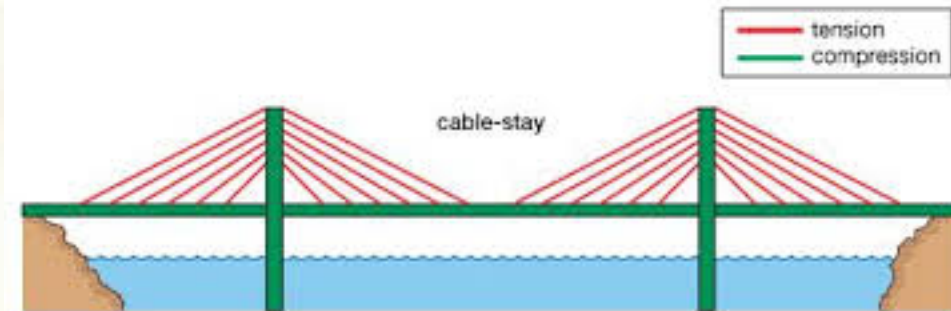




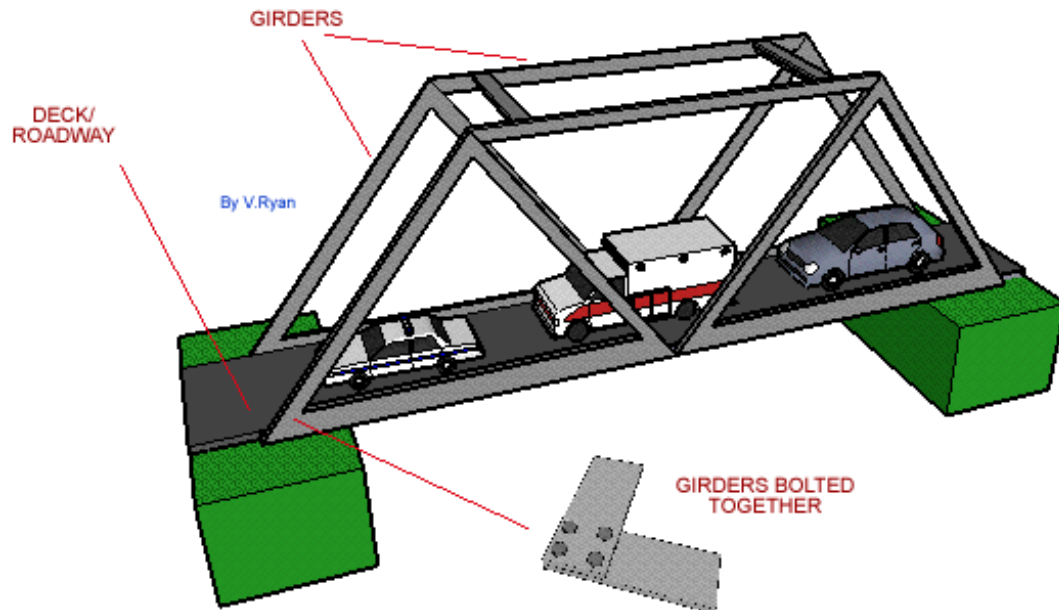
## ARCH BRIDGE



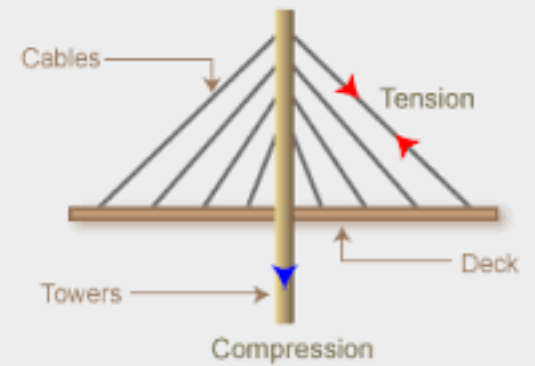
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## Cable stay bridge







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Now I have claimed it. All I had to do was fly over it for it to  
be mine forever. I can wear it like a giant diamond necklace,

or just fly above it and marvel at its sparkling beauty.  
I can fly—yes, fly. Me, Cassie Louise Lightfoot, only eight  
years old and in the third grade, and I can fly. That means  
I am free to go wherever I want for the rest of my life.



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