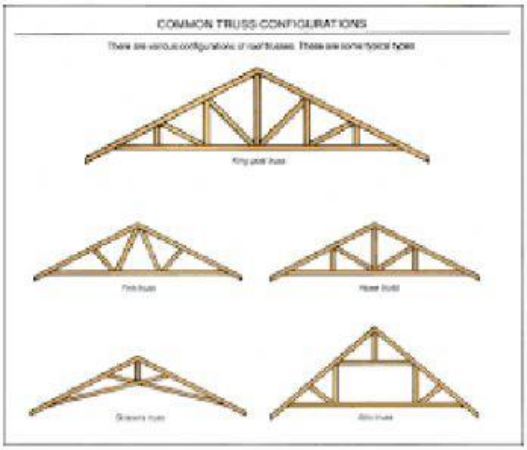
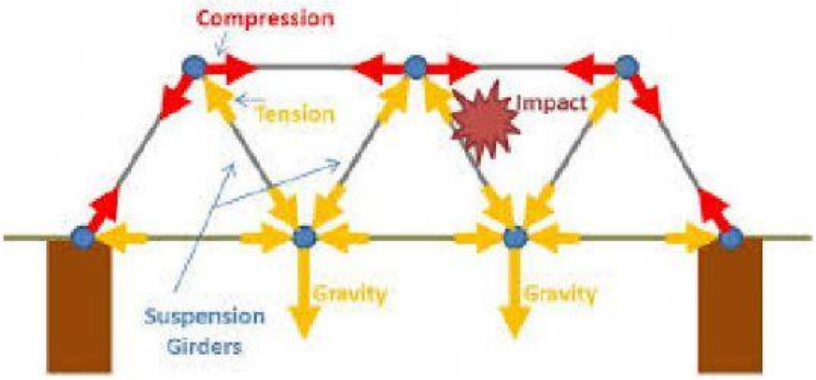
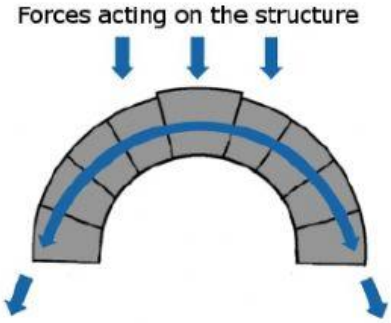
Strong Structures

1) Beam
   - a ***beam*** is a horizontal surface that is designed to support a load
   - the strength of the beam is determined by the material that the beam is made of
     - e.g. a wooden beam will be able to hold less weight than a steel beam
   - strengthening beams
     - I-beams are commonly used in construction applications
     - corrugation (multiple folds) within a beam increases stability
     - rebar (reinforcement bars) are made of steel and imbedded in concrete to increase its tension strength
2) Truss
   - a ***truss*** is a network of beams arranged in triangles
   - the truss works by distributing the force of a large load across a beam or do a different, well-supported point
     - different beams in the truss undergo different forces (compression or tension) depending on their position

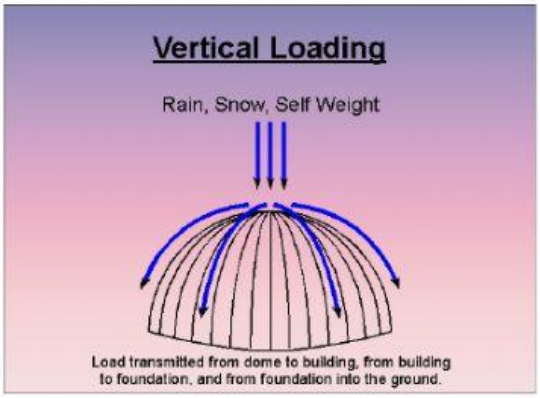


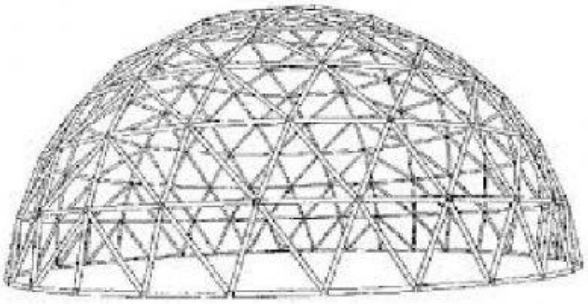


3) Arch
   - an ***arch*** is a curved structure used to support loads
   - the arch works by distributing the force on the top of the arch down the sides of the arch and eventually to the ground



4) Dome
   - a ***dome*** is another curved structure that supports loads
     - the curve is three dimensional on a dome and exists in a plane on an arch
   - the dome also works by distributing the force from the top down along the sides of the arch to the ground





Assignment:

1. What are the four ways to strengthen structures? Give a new example of each.
2. How can a beam be strengthened?
3. What are some advantages of using trusses?
4. List four examples of structures that use trusses.
5. What are the similarities and differences between arches and domes?
6. How are compression forces present in arches and domes?