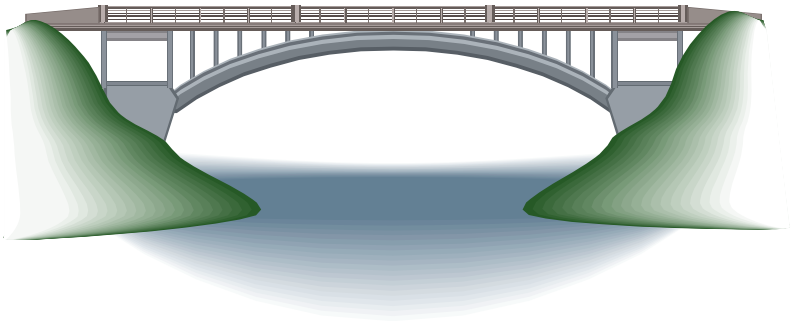
Building Bridges

Bridge Design & Construction Activity

Situation

Materials and tools available are perhaps the most limiting factors of bridge design and construction.



Design and construct a bridge that will span a gap of four feet using only the tools and materials available. The bridge must hold a static live load of one standard size masonry brick (laying flat) at three different randomly selected points without breaking. The bridge must also hold a dynamic live load of one standard size masonry brick on wheels, moving across the bridge without breaking.

Resources

Time	30 class periods total 10 for research and design 20 for construction
People	Four per group
Energy	Human for construction
Information	Loads – static, dynamic, live, dead. Concepts of tension, compression and torsion. Other information about how bridges work
Money	See price list
Tools	X-acto saws, miter boxes, Dremel, drill press, and band saw.
Materials	1”x1”x1” polystyrene cube - $1 package of 5 Popsicle sticks - $1 package of 10 Thread - $1 per inch 1/16” dowel rod - $1 per inch
Space	No limitations but consider the size of the brick and wasted material. You can only work within your assigned space on the platform.

Other Criteria

- The most cost effective, successful design will be determined to be the best.
- The materials available are limited to those listed and can only be manipulated using the tools listed.
- The bridge must connect to both sides of the platform.
- The space on either end of the platforms may be modified, but not destroyed.
- The deck of the bridge must be accessible for placement and 'drive through' of the brick.
- The three randomly selected points for brick placement will only be on the three feet on center of the span.

Required Documentation

A design log will be kept by each group and handed in upon completion of the project. The design log must include:

1. Appropriate research and referenced sources.
2. Sketches of alternate design possibilities.
3. Neatly completed drawing of final solution, including:
    a. front, top, and side elevation views
    b. dimensions
    c. designated materials
4. All Materials Log Sheet(s).
5. Records of all tests conducted.