

# Bridges and Stress

When you squeeze an object, you are providing **stress** to the material. If you squeeze hard enough, the material will distort from its original shape. This is called **deformation**.

When something goes over a bridge, the bridge experiences stress. If there is too much stress, the bridge will deform and possibly break. As an engineer, think about the different ways your bridge can break. If your bridge does break, think about ways you can make it stronger!

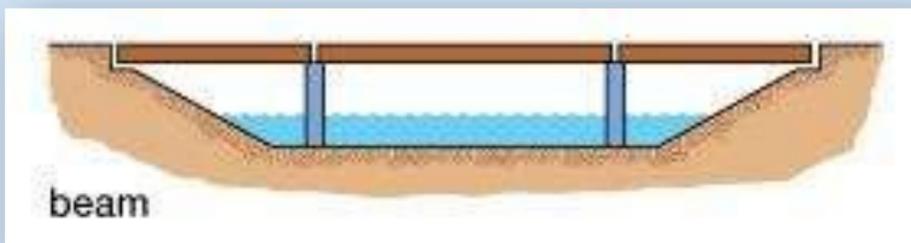
## Your Engineering Challenge!

Create a bridge, made from available materials around you, that spans 18 inches. How much load it can carry in the middle before it starts to fail? Ask yourself to identify how it failed, make adjustments, and then try again. You can also challenge a partner to a bridge building contest!

### Materials

1. Found materials like popsicle sticks and string, tape or glue
2. Data Sheet
3. Pencil
4. Weights like pennies or beanbags
5. Tape measure
6. Two blocks to elevate your bridge

## Types of Bridges



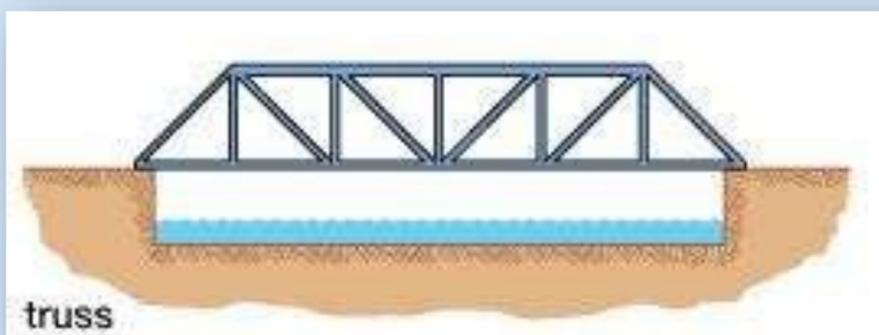
A beam bridge is supported on two ends and can have support columns.



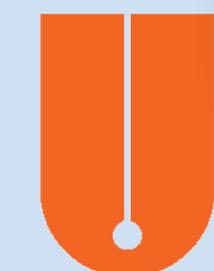
A suspension bridge carries loads through cables.



An arch bridge works by transferring loads to each end of the bridge.



A truss bridge is made up of connecting units in the shape of triangles.



# Bridge Data Table

For your first experiment, describe your bridge type. Use a block under each end of your bridge to elevate it off a table top, or the floor. Add pennies, or weights to the center of your bridge until it begins to deform. Record the amount of weight you added. In your following experiment, describe what changes you made and record the new weight it holds. See if your changes make your bridge stronger!

Experiment Number	Bridge Type / Changes	Number of Pennies or Weights
1.		
2.		
3.		

