

Engineering with Legos : Sturdy Structures & Tall Towers

Name: \_\_\_\_\_



**BRIDGES**

There are many different bridges, but here are a few types. Try building some of these bridges and see which ones are the sturdiest! You can also combine different designs to make the bridge even sturdier.

**REVIEW:**

- What is Bracing?
- What is a cantilever?
- What is a strong shape?

**LESSON: Bridges**

Q: What is the purpose of a bridge?

A: Usually to connect to land masses which are separated by a river, body of water, or a big ditch.

Q: What does a bridge do?

A: It helps support weight so you can get from one side to another.

**Who has ever seen a bridge?**

**Has anyone gone to the Golden Gate Bridge in San Francisco?**

**WORKSHEET:** Pass out worksheet and go over bridges.

**Bridges that work well are always symmetrical and do a good job at distributing weight down to the ground through their columns.**



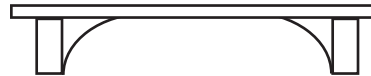
**BEAM BRIDGE:** Consist of a strong beam. These bridges are usually shorter in length and are the simplest bridge to build.



**TRUSS BRIDGE:** These bridges are more complex to build. But when built properly, they are very strong. They consist of multiple triangles which help distribute weight and make it very sturdy.



**ARCH BRIDGE :** This design uses arches to help distribute the force to the sides of the bridge. These can be complex. You can also try using a beam to triangulate the bridge instead of the arches.



**SIMPLE CANTIL EVER BRIDGE :** This bridge has beams that are supported by another beam or a tower that goes straight to the ground. This helps distribute weight in important areas.

**Challenge 1 - Individual or Team Build**

- Build a free standing bridge at least 10" long. (a little shorter than the length of a piece of paper). Must be off the ground.

**Challenge 2 - Individual or Team build**

- Build a bridge at least 12" that can support weight at different locations.

**Challenge 3 - Individual or Team build**

- Build a bridge that has arches or triangles to support it.

**Challenge 4 Ultimate- Individual or Team build**

- Build a bridge that can support the instructors foot!