



# High Touch High Tech®

Science Experiences That Come To You™

## Truss Bridge

### Supplies:

- 2 Styrofoam cups
- Strip of cardstock
- Toy cars
- 17 toothpicks
- Paper plate
- 10 gum drops
- Bowl of rocks

### Instructions:

1. With these supplies you should have enough to make 2 sets of trusses and connect them to form a bridge
2. Map out your truss by laying the toothpicks down on the table in a triangle pattern.
3. Now use the gum drops to connect your toothpicks. You should have 2 flat trusses.
4. Use your remaining toothpicks to connect your trusses. Now you have a truss bridge!
5. Place this new bridge across your Styrofoam cup span. Place the paper down so it has a “road” running across it.
6. Load your bridge up: How many rocks and cars can you place on your bridge?
7. Optional: Put just the paper across the span like a beam bridge. Can you put as many rocks and cars as you can with the truss bridge?

### The Science Behind it:

We use them all the time, but bridges were something that we invented to solve a problem. What sort of problem does a bridge solve? Get over a river! Get over a canyon! It helps us get from place to place more efficiently.

The most basic bridge is a **beam bridge**, which is just a simple beam across an open space. The problem with this design though is that it only works for short distances and low loads. So, inventors had to use physics to come up with new ways to span larger distances and hold things like heavy cars and trucks. One type of bridge they created is called a **truss bridge**. The structural frame of the trusses uses the geometric rigidity of the triangle to lend support to the bridge.

The triangle is super strong because the angles at the corners compress spreading the forces out so that the bridge can bear more weight and span greater distances.