

The Toothpick Bridge Project

The Scientific Method

Make careful observations of nature.

Form a hypothesis to explain a specific phenomenon or event.

Perform experiments to replicate and understand the phenomenon.

Gather evidence through experimentation to support, reject, or modify their hypothesis.

Repeat these steps until the weight of evidence indicates a sound hypothesis.

Create a theory based on a sound hypothesis that has not been proven false by experimentation.

Accept a theory as a law, if it is proven to be a *non-varying* phenomenon.

The Rules:

Your bridge must be free-standing, and span a gap of 30 cm. It will sit on a piece of plywood that has a hole in the center; this is to attach the string which will hold the weights used to test the bridge.

The bridge roadway should be at least 5 cm wide and 30 cm long, and be able to accommodate the testing string attached to the support rod. The roadway need not be filled in ... a row of toothpicks on either side is acceptable. But it must be level. There must be a space under the bridge of at least 5 cm, and not more than 10 cm, that runs the length of the span. Glue (ordinary white glue only) may be applied only to points of contact; toothpicks may not be soaked or coated with glue.

When your bridge is tested, it will 'fail' when the roadway breaks, or flexes more than 2 cm.

Your bridge will receive an 'efficiency' rating, calculated as follows:

Efficiency = mass supported (in grams) divided by the weight of the bridge (in grams)

Clearly, the more mass your bridge will hold, the better, ... but the more your bridge weighs, the lower its score will be. Don't use too many toothpicks! **This bridge Can Not have a mass greater than 40grams**

