

Toothpick Bridge Design

Subject Area	Inside Earth
Age or Grade	8 th
Estimated Length	5+ class periods (does not have to be consecutive classes)
Prerequisite knowledge/skills	Students have completed the chapter on earthquakes and their affects. They are also working on a Safety Project outside of class a long with this project.
Description of New Content	Students are introduced to what makes a strong, sound structure. Students will learn about the truss structure, the importance of the strength of the triangle and the distribution of forces along the truss.
Goals	Students should work in teams to: 1) Create an original bridge design. 2) Build the bridge out of toothpicks and glue using their design. 3) Test the bridge by measuring how much weight it can hold.
Materials Needed	Bridge Powerpoint presentation (see references), toothpicks, Elmer's glue, wax paper, graph paper, rulers, weights, a cup that can hang from the bridges
Procedure	<p>Opener- Show students a square structure made out of straws. Ask them to brainstorm ways to make the structure stronger.</p> <p>Development- 1) Show Bridge Powerpoint presentation which outlines the instructions and guidelines of the project. Either assign teams or have students pick their own teams. (Teams of 4 work best.) Students will spend ~two class periods brainstorming about a bridge design, drawing a rough draft, and drawing a final draft which will be used to build the bridge. Students will spend ~two class periods building the bridge with toothpicks and Elmer's glue. Building the bridge works best if you place wax paper over the design and students build directly on the design.</p>

	<p>Closure- Once bridges have been completed, they will be tested. Hang a cup (coffee can works well) from the “driving bed” of the bridge and have teams place weights in the cup. They decide how they want to place the weights and at what speed. (NOTE: Bridges hold more weight than expected; make sure you have enough weights available.)</p>
<p>Evaluation</p>	<p>Students are graded on teamwork. Their designs are graded for being within guidelines and for completeness. Bridges that do not work will not be penalized. The effort is the most important part!</p>
<p>References</p>	<p>See the Toothpick Powerpoint on the Homepage</p>