

# Popsicle Stick Semester Project

## Project Introduction

2017 Physics Semester Project

Popsicle Stick Bridge

What follows is an outline as to how you can run such a “contest” in your classroom and meet the expectations of the curriculum at the same time. This is not, however, a set of prescriptive lesson plans. It is, however, a collection of ideas and helpful hints from someone who has had a great deal of fun running this classroom contest over the past ten years.

### The Contest

The challenge can be stated quite simply.

- Students must construct a bridge made of popsicle sticks and carpenters glue. No other materials may be used. Standard popsicle sticks are 11.5 cm long, 1 cm wide, and approximately 0.2 cm thick.
- The bridge must span a gap of 1 m.
- Students are allowed to use a maximum of 150 popsicle sticks.
- This deck must be unobstructed and 8 cm wide.
- The load will be applied to the deck of the bridge by means of a rope or strap that will hold the weight below the bridge.
- Students must incorporate structural elements learned in class (e.g., laminated beams, trusses, sway bracing, etc.)
- Students must include a blue print on their design (detailed sketch)
- Students must also include a one page report on their bridge. Include design details, why particular bridge design was chosen, problems, ways to improve their design.

I always make it a goal for the students to make a bridge that will support at least 45 pounds.

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Criteria	Level 1 – 5pts	Level 2 – 10pts	Level 3 – 15pts	Level 4 – 20pts
Weight Held	10lbs	25lbs	35lbs	45lbs
Weight to sticks used ration	Weight held / Sticks used	Weight held / Sticks used	Weight held / Sticks used	Weight held / Sticks used
Design elements -incorporates the design elements (beams, trusses, triangles, braces) learned in class	-the student demonstrates little understanding of the design elements used in their bridge	-the student demonstrates some understanding of the design elements used in their bridge	-the student demonstrates a considerable understanding of the design elements used in their bridge	the students demonstrates a thorough understanding of the design elements used in their bridge
Use of Materials and Aesthetic Appeal -the bridge is symmetrical -the materials have been used neatly and effectively	-bridge lacks symmetry -most of the materials are put together ineffectively and are sloppy	bridge is almost symmetrical -some of the materials are put together ineffectively and are sloppy	-bridge is symmetrical -most of the materials are put together neatly and effectively	-bridge is symmetrical -materials are put together in a neat and highly efficient manner
Blueprint – the student is model how and why certain designs were used	The student demonstrates little understanding of the design elements used In their bridge	The student demonstrates some understanding of the design elements used In their bridge	The student demonstrates considerable understanding of the design elements used In their bridge	The student demonstrates thorough understanding of the design elements used In their bridge
Discussion of Design Elements -students is able to discuss how and why they used certain design elements to bridges holding 45lbs	-the student demonstrates little understanding of the design elements common to bridges holding lbs.	the student demonstrates some understanding of the design elements common to bridges holding 45lbs.	-the student demonstrates considerable understanding of the design elements common to bridges holding 45 lbs.	-the student demonstrates a thorough understanding of the design elements common to bridges holding 45 lbs.
Reflection -students provides a thorough reflection about the project	-student provides little reflection about design elements, use of materials, or ways to improve the project	-student provides some reflection about design elements, use of materials, or ways to improve the project	-student provides a thoughtful reflection about design elements, use of materials, or ways to improve the project	-students provides and thoughtful and thorough reflection about the design elements, use of materials, or ways to improve the project