Earthquake Proof buildings: Engineering design challenge

Purpose: Create a stable building using toothpicks and mini-marshmallows, which can withstand a variety of “earthquakes.” As contractors and engineers, you will have to design a building that will be cost effective, yet sturdy. Height and visual appeal will be taken into consideration. You must write this up as a lab report with these sections:

1. Statement
2. Materials and Methods, including a blue print of your design
3. Data (including how many materials used, as well as cost of said materials) You and your group will be providing before and after estimates.
4. Results (use the rubric below)
5. Conclusion

Materials:

1 plastic wrap (provided by teacher)

1 bag mini-marshmallows or 1 bag of big marshmallows

1 box of toothpicks flat or round

What to do:

1. Try to come up with a design and cost analysis of your project. Please consider:
   1. 1 marshmallow = $1.00
   2. 3 toothpicks (flat) = $5.00; 2 toothpicks (round) =$5.00
   3. Labor $500 per person in your group
2. Estimate the costs and submit it to Ms. Heaton for you start building.
3. After steps 1-3 are complete, you may begin building.
4. You will be building on your cookie sheet so you must at the very least, bring that.

Your construction will be graded using the rubric below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Sturdiness | Cost Effectiveness | Richter Rating | Damage Assement |
| 4 | Taller than 8 inches in height, solid foundation, and reinforced bars. | More than 25% underbudget | 8-10 (3 or more inch push) | 0 to little damage; less than 25% |
| 3 | 5-8 inches in height solid foundation, and reinforced bars. | At or less than 25% under budget | 6-7 (2.5 inch push) | 25% damage; standing |
| 2 | 3-5 inches in height with a solid foundation | 50% over budget | 3-5 (2 inch push) | 50% damage; leaning |
| 1 | Ineffective base or foundation; less than 3 inches in height | More than double over budget | 1-2 (1.5 inch push) | Completely destroyed |