

# TOWER CHALLENGE

## UNIT: STRUCTURES LEVEL 2

### THE PROBLEM:

Design and build a tower that will hold as many of the 5 lbs. weights as possible, keeping them balanced for 5 seconds or more.

Bonus points will be earned for the overall height of the tower. ***Tower must exceed 10 inches to be tested.*** The height of the tower will be determined by the top of the weight platform to the ground.

### CRITERIA

1. Follow the **Design Process** - Points are awarded for completing each step and documenting in this engineering packet.
2. Use **Effective Teamwork**. Teamwork points will be taken away if necessary.
3. Remember **SAFETY FIRST** at all times.
4. Use only the supplies and equipment provided.
5. You may use one weight plate to test the balance of your tower. All testing will be done at the end. We will test until your tower cannot support the weight (destructive testing).

### MATERIALS:

You may only use the items provided. You do not need to use them all.

#### Supplies:

- 1 plastic cup
- 6 plastic straws
- 6 rubber bands
- 6 popsicle sticks
- 3 paper clips
- 1 pink foam square (4"x4")
- 5 Hot glue sticks
- 10 Cardboard Strips (2"x12")
- 2 Balsa Wood Strips ( $\frac{1}{8}$ " x  $\frac{1}{8}$ " x 36")
- 1 Clear Platform



## Brainstorming - Design Plan Sketches/Notes:

(At least 2 different ideas in two boxes required to receive full score)

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## Design Plan Sketch:

**Evaluate:**

1. What modifications did your team make to your original design plan and why?

## Tower Rubric

- 0 = missing
- 5 = incomplete/limited details/difficult to read
- 10 = meets expectations/thoughtful/neat

|   | 0 | 5 | 10  |  |
|---|---|---|-----|--|
| <b><u>Brainstorming Sketches &amp; Notes</u></b><br>2 or more ideas including sketches and words, neatly drawn and written  |   |   |     |  |
| <b><u>Final Design</u></b><br>Detailed design neatly drawn and described with words or labels   |   |   |     |  |
| <b><u>Weight Test</u></b><br>Add 5 lbs. weights, one at a time (5 points per 5 lbs. of weight added.) <ul style="list-style-type: none"><li>• Weight must rest at least 5 seconds</li><li>• Test until collapse</li></ul> |   |   | /50 |  |
| <b><u>Height Measurement</u></b> <ul style="list-style-type: none"><li>• Towers over 12 inches earn bonus 5 points</li><li>• Towers over 18 inches earn bonus 10 points</li></ul>   |   |   |     |  |
| <b><u>Evaluate</u></b><br>Question answered completely and thoughtfully   |   |   |     |  |
| <b><u>Teamwork/Time Management</u></b><br>Team utilized effective teamwork  |   |   |     |  |
| <b><u>Creativity</u></b><br>Thinking outside of the box, Team used a variety of supplies in different or unexpected ways  |   |   |     |  |
| <b>Column Point Totals:</b>   |   |   |     |  |