

Project Build It! (Tower)

Project Title: _____

Group Members' Names:

Due Date: _____

Checklist

- | | | |
|--------------------------|--|------------|
| <input type="checkbox"/> | Preliminary Sketch | /4 |
| <input type="checkbox"/> | Criteria Check | /12 |
| <input type="checkbox"/> | Observation Deck | /1 |
| <input type="checkbox"/> | Aesthetics Paragraph | /4 |
| <input type="checkbox"/> | Area Ratio Paragraph | /4 |
| <input type="checkbox"/> | Materials Paragraph | /4 |
| <input type="checkbox"/> | 2 and 3-Dimensional Shape Paragraph | /4 |
| <input type="checkbox"/> | Design Difficulties and Changes Paragraph | /4 |

Total: /37

Project Build It! (Tower)

You are a contractor hoping that your design will be chosen for the new communications tower in Lethbridge. This tower must be the tallest in the city so that signals for telephone, television, and radio will be able to pass above all other buildings. The communications company would also like to build a restaurant and observation deck near the top of the tower, so the structure must be able to carry this additional load safely.

The problem: You and your group have been hired by one of the companies who want to build the new tower. As part of your preliminary work, you must design and build a tall, stable, free-standing model of the proposed tower with the materials and criteria listed below.

Materials:

- newspaper
- uncooked spaghetti
- bamboo skewers
- plastic straws
- masking tape
- scotch tape
- marshmallows
- a ruler (not for building)
- a balance (not for building)
- golf ball (not for building)
- a fan (not for building)

Criteria:

- Your structure must be built from at least three of the materials listed.
- Your structure must be the tallest possible free-standing structure you can create, that can support an egg or golf ball without structural failure (2 minute time).
- Your structure must be able to withstand the wind from a fan for 60s.
- Your structure must be aesthetically pleasing.

1. You must include a detailed preliminary sketch of your design. This sketch should be labelled and easy to read and understand. Graph paper must be used in this step.

<p>4 – Excellent preliminary design sketch. Labelled, easy to read, with no information about materials, structure missing.</p>	<p>3 – Good preliminary design sketch. Most is labelled and easy to read.</p>	<p>2 – Adequate preliminary design sketch. Some is labelled and easy to read.</p>	<p>1 – Minimal information is included in the preliminary sketch.</p>
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2. Tower is free standing. /2

3. Tower is made of at least three materials. /2

4. Tower can support the weight of a golf ball – A golfball will be placed on the top of your structure.

- 4 points - no structural failure for full 2 minutes**
- 3 points - no structural failure for at least 1.5 minutes**
- 2 points - no structural failure for at least 1 minute**
- 1 point - no structural failure for at least 30 seconds**

5. Wind Stability – A fan will be placed one meter away from your tower and turned on for 60 seconds. Your structure must not fall over.

- 4 points – can withstand wind for full 60 seconds**
- 3 points – can withstand wind for 45 seconds**
- 2 points – can withstand wind for 30 seconds**
- 1 point – can withstand wind for 15 seconds**

6. Is there an observation deck in the top 10cm of your tower?

/1

7. In paragraph form, explain how your structure has been made to be aesthetically pleasing.

4 – Excellent explanation. Comments are concise and backed up with scientific information learned in this unit.	3 – Good explanation backed up with scientific information learned in this unit.	2 – Adequate explanation, but missing evidence.	1 – Minimal explanation is given.
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8. Compare the area of the top of your structure with the area of the bottom of your structure. In paragraph form, explain what you found, and whether that ratio proved to be an advantage or disadvantage in making your tower strong and stable.

4 – Excellent explanation. Comments are concise and backed up with scientific information learned in this unit.	3 – Good explanation backed up with scientific information learned in this unit.	2 – Adequate explanation, but missing evidence.	1 – Minimal explanation is given.
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9. In paragraph form explain why you chose the materials that you did.

4 – Excellent explanation. Comments are concise and backed up with scientific information learned in this unit.	3 – Good explanation backed up with scientific information learned in this unit.	2 – Adequate explanation, but missing evidence.	1 – Minimal explanation is given.
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10. In paragraph form, explain what 2 and 3-dimensional shapes you used to build your structure. Why did you choose these shapes.

<p>4 – Excellent explanation. Comments are concise and backed up with scientific information learned in this unit.</p>	<p>3 – Good explanation backed up with scientific information learned in this unit.</p>	<p>2 – Adequate explanation, but missing evidence.</p>	<p>1 – Minimal explanation is given.</p>
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11. Describe any design difficulties you had and how your design idea changed from your preliminary sketch to your end product.

<p>4 – Excellent explanation. Comments are concise and a comparison is made between your preliminary sketch and your end product.</p>	<p>3 – Good explanation. A comparison is made between your preliminary sketch and your end product.</p>	<p>2 – Adequate explanation, but missing comparison.</p>	<p>1 – Minimal explanation is given.</p>
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