

Think Like an Engineer Journey Pt. 2

Engineering Notes: Camp Cabin

Design Challenge:

You've been contacted by a local engineering firm. The firm has a client who owns a local summer camp and would like you to design their new cabins. She would like the cabins to be based upon, or inspired by, shelters created by animals.

IDENTIFY & INVESTIGATE THE PROBLEM.

Goal: Engineer a model cabin inspired by a shelter created by an animal.

Design Thinking Process

- Identify the Problem
- Investigate the Problem
- Brainstorm & Plan
- Build
- Test
- Analyze Results and Improve
- Share Your Solution

CRITERIA

- Your model cabin must be inspired by at least one of the example animal shelters.
- Your model cabin must be water and wind resistant.
- Your model cabin must contain an entrance. The entrance should allow for a ¼ sheet of construction paper to easily be placed inside and taken out.
- Your model cabin must be at least 5 inches tall and 5 inches wide.

CONSTRAINTS

- You have 10 minutes to brainstorm and plan. After, you have 20 minutes to engineer.
- You may use up to one sheet of cardboard, two sheets of construction paper, two plastic cups, 12 inches each of masking and packaging tape, and any amount of aluminum foil and string.
- A measuring tape and scissors may be used as tools.

(continued)

**BRAINSTORM SOLUTIONS, PLAN AND BUILD A PROTOTYPE.**

**Which animal shelter(s) will you draw inspiration from?**

- Bird's Nest
- Beaver Lodge
- Termite Mound
- Wasp Nest
- Other: .....

**What's the design plan for your model cabin?** Write ideas or draw plans for your design here. Use extra paper if you need to!

*(continued)*

**TEST, EVALUATE, AND REDESIGN.**

- **Is the cabin wind resistant?** Place your cabin in front of the fan for 15 seconds. Start the fan on the lowest setting. If your cabin isn't moved by the wind, turn the fan to a higher setting.
- **Is the cabin water resistant?** Put a small sheet of construction paper inside of your cabin. Spray the top of the cabin with water 15 times, and check if the construction paper was able to stay dry.

**What happened during testing?**

In the wind, my cabin:

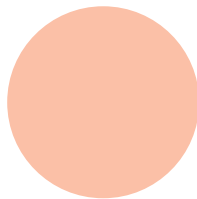
- It slid.
- It tipped or fell.
- The wind pushed it.
- No movement.

This much water dripped on the paper in my model cabin:

- None
- Spots of  $< \frac{1}{2}$  inch
- Spots of  $\frac{1}{2}$ –1 inch
- Spots  $>1$  inch



$\frac{1}{2}$  inch



1 inch

*Courtesy of the Museum of Science, Boston. Adapted from the Engineering is Elementary, It's in the Bag: Engineering Bioinspired Gear. ©2014, 2016 Museum of Science.*