

Tallest Paper Tower Challenge

Name: _____

Date: _____

Instructions

Overview: in this contest, your goal is to build a tower that is as tall as possible and can support a can of food at the top. Your final score depends on both the height of the tower and the amount of paper you use. Watch this video to learn about the project:

<https://sbgo.org/fluorchallenge2021-video>

Materials

You can only use the types and amounts of paper and tape described in the video as construction materials for your tower. You can use scissors, a ruler, and a pencil as tools while you design and build.

Scoring

Your score is calculated using this equation:

Total score = (distance to the bottom of the can in centimeters) – (2 × number of pieces of paper)

Rules

1. The tower can only be built from paper and tape. Tools (scissors, ruler, and pencil) cannot be used as structural elements of the tower.
2. You cannot use more than 30 pieces of paper.
3. You cannot use more than one roll of tape.
4. The bottom of the tower can only be taped to the horizontal surface that it rests on (floor, table, etc.). It cannot be taped to anything else (like the vertical leg of a table or a wall) or supported by a person.
5. You are allowed to fold, bend, roll, cut, etc. the pieces of paper.
6. Materials cost is not prorated. If you cut a piece of paper in half and only use half the sheet, it still counts as a whole sheet.
7. The tower must support one can of food (14–16 oz or 400–500 g) for at least 1 minute without collapsing. You cannot touch, modify, or repair the tower during this minute.
8. The can must rest freely on the tower and be removable. It cannot be taped to the tower.

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Student worksheet

Directions: Fill out this worksheet as you work on your project.

1. **Background research.** Use this space (and extra paper if necessary) to write down your background research.

2. **Preliminary testing.** Use this space to record any important notes about your preliminary testing, for example, which beam cross-section you found to be the strongest.

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Student worksheet

3. **Design.** Use this space to draw design ideas for at least two different towers. Use the back of the page or extra paper if you have more ideas and need more space.

4. **Build.** Share your ideas with other people in your group. Decide which tower you will build. You can combine ideas from different people to make a single tower.

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Student worksheet

5. **Test.** Test your tower by gently placing a can of food on top. Record any observations about your test here.
6. **Evaluate.** Based on the design criteria and constraints, what changes could you make to your tower to improve your score?
7. **Iterate.** Based on your evaluation, try to improve your tower to get a higher score.
8. **Final design.** What could you improve about your final design if you had more time?
9. **Calculate your score.**
- How many pieces of paper did you use in your final tower design? Paper used in earlier designs does not count. _____
 - When you place the can of food on top of your tower, what is the distance (in centimeters) from the floor to the bottom of the can after one minute has passed?

 - Calculate your final score using this equation:

$$\frac{\text{distance in centimeters}}{\text{number of pieces of paper}} - (2 \times \text{number of pieces of paper}) = \text{final score}$$