

## Build The Tallest Tower

### Competition Category: Maker Family Challenge

*The Parent-Child equation often becomes stressful when it comes to learning. It is because learning is seen as equal to just studying. We want to change that by converting STUDYING into MAKING. “Maker Family Challenges” are organized to make parent-child engagement more exciting when it comes to learning. The **Maker Family Challenges** are online live events in which the child along with one parent solves a design problem in a limited time. The design problem may range from a wide variety of areas.*

*This version of Maker Family Challenge is based on **Building the Tallest Tower***

### Introduction

Throughout the world, engineers have designed a wide variety of observation towers in different shapes and sizes (Figure 1). The regular buildings and skyscrapers have rooms, offices, etc. on every floor, whereas observation towers may have a mostly "hollow" structure with an observation deck on top. Other similar structures that have a hollow frame with a heavy load at the top can include water towers and radio towers (Figure 2).



**Figure 1 (from left to right):**

The Eiffel Tower (France), The CN Tower (Canada), The Space Needle (USA), The Pitampura TV tower (India).



**Figure 2 (from left to right):** Water Tower, Radio Tower

The Tallest Tower Challenge is inspired by towers shown in Figures 1 and 2

### Challenge Statement

The challenge is to design and construct a model tower using only newspaper, tape and scissors. The teams will be using limited supplies and build the tower within the defined time limit. The goals are:

- The tower must be as tall as you can make it,
- It should be stable enough to stand upright,
- It should hold the weight of a Tennis ball for one minute.

### Challenge Description

Tallest tower challenge is about designing the tallest, stable and sturdy tower with the limited supplies in the given time. These are some of the challenges faced by engineers in the real world—with objectives, requirements and constraints such as budgets, material limitations and deadlines.

You will be working as an engineering team that can design a structure to meet the objectives with the fewest materials (hence, less cost) in the given timeline.

When you are brainstorming your idea, think about the real skyscrapers you have seen as inspiration, including the tallest buildings and towers that you have seen. What are their shapes? What are their foundations like?

As we are taking up this challenge we are learning-

- About structural engineering.
- About engineering design and redesign.
- How engineering can help solve society's challenges.
- Skills like teamwork and problem solving.



## Competition Timeline

- 7th January: Challenge opens
- 19th January: Registration closes
- 22nd-23 January: Challenge Day
- 29th January: Results announcement-Felicitation

## On the Challenge Day

- 10 min: Challenge Introduction
- 10 min: Prep up time
- 15 min: Building time
- 10 min: Testing time and activity submission time





## Team Structure

- Team 1+1 (2 Members)
- 1 Student + 1 Family Member (Parent)

## Rules & Regulations

1. The tower can only be built from paper and tape. See the materials list for allowed types of paper and tape. Tools cannot be used as structural elements of the tower.
2. You can only use 20 pieces of newspaper.
3. You can only use one roll of tape (1inch).
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. If you cut a sheet of paper in half and only use half the sheet, it still counts as a whole sheet.
7. For scoring purposes, 1 piece of paper is 1 sheet of paper.
8. The tower must support a Tennis Ball for at least 1 minute without collapsing. You cannot touch, modify, or repair the tower during this minute.
9. The Ball must rest freely on the tower and be removable. It cannot be taped to the tower.
10. It's a 15 min challenge therefore, the design (making) must be completed within this time.
11. Will only place the load on the tower when instructed to do so.
12. Must follow the instructions by the Coach/Mentor during the competition.
13. You will be making tower along with one parent
14. You will need complete the activities on Makershala Learn App
15. Camera must be ON during the time of the competition. Camera off will lead to disqualification.
16. Camera must be adjusted such that the workspace is clearly visible at all times throughout the competition.
17. It is advised to join from two devices (Join meeting in one and Open App in the other)

### Materials Required

Sr. No.	Material Name	Reference Image
1.	20 pieces of Newspaper sheets	
2.	Scissor	
3.	Cello Tape/ Masking Tape (1 inch)/ Stapler/ Glue	
4.	Measuring Tape	
5.	Tennis Ball	
6.	Makershala Learn App (Download <a href="#">iOS</a> , <a href="#">Android</a> )	
<p>Note: Use of A4 sheet, Chart Paper, Cardboard, Duct tape, Double Sided tape, Packing tape is <b>not allowed</b></p>		



## Evaluation Criteria

Teams (Parent-Kid) will be building and testing the tower live during the 1hr slot given to them. There will be other teams present in the slot. The towers built will be evaluated during the competition for the 1 hr slot based on following criteria.

### For age 8-10 (Tinkering Toms)

- Number of sheets used
- Height of the tower in cm
- Stability of the structure

### For age 11-13 (Brainy Bombs)

- Design/Idea/Sketch made
- Design Implemented
- Number of sheets used
- Height of the tower in cm
- Stability of the structure

**Note:** *The height will be measured twice, once at completion of building the model without the weight on top, and second after 60 seconds of holding the weight.*

## Rewards

- *First Prize:* The team with the best tower will be rewarded with First Prize. *Makershala DIY Project Kit, National Geographic Kids Magazine yearly Subscription, Kidzania Theme Park Tickets, First Position Certificate.*
- *Second Prize:* The team with the second best tower will be rewarded with Second Prize. *Makershala DIY Project Kit, Kidzania Theme Park Tickets, Position Certificate.*
- *Third Prize:* The team with the third best tower will be rewarded with Third Prize. *Makershala DIY Project Kit, Kidzania Theme Park Tickets, Position Certificate.*
- *Fastest First:* One team which is fastest to complete the tower building will be rewarded with Fastest First Prize. *Makershala DIY Project Kit, Category Certificate.*
- *Most Creative:* One team with the most unique tower building will be rewarded with the Most Creative Tower Prize. *Makershala DIY Project Kit, Category Certificate.*
- *Runner Up Prize:* 10 teams with good tower buildings but unable to make into top 3 will be rewarded with the Runner Up Prize.
- Certificates for all the participants
- 10% discount on Makershala Program for all participants



## Tutorials & Help Text

After registration, each team enrolled in the competition can access the tutorials and help text through the Makershala Learn App. This will help you in improving your outcomes. You can download the App for iOS or Android from Apple Store and Google Play Store respectively. Below given are the download links:

- iOS: <https://apps.apple.com/in/app/makershala-learn/id1594348811>
- Android: <https://play.google.com/store/apps/details?id=com.makershala.learn>

## A few inspirations to start with



*Keep Practicing to Build the Tallest Tower! We are waiting to see you on the challenge day!*

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***Happy Making,***

***Makershala***