

DiscoverE Challenge: Tallest Cup Tower

Student Instructions:

Challenge

Build a stable tower out of cups and make it as tall as possible!

These instructions are also presented in a video by ExxonMobil engineer Sylvana Azana. Watch on YouTube here: <https://youtu.be/FWckfmtspEs>

Materials

- Large paper or plastic cups of uniform size (12 oz or 16 oz are best)
 - The more cups you have, the higher you can go. But fewer cups may challenge you to think creatively about how to design your tower.
- Alternative materials: empty soda cans, dixie cups, rolls of toilet paper, round plastic plant pots

1. Identify the Problem

- The most critical step of any engineering challenge is to **understand the problem** you are trying to solve.
- How can you make a cup tower as tall as possible without it falling over? Here are the **specs**:
 - The only materials you can use are the cups themselves.
 - The tower must stand on its own without any human assistance and:
 - You can build on your own – or with a partner. If you're at home, team up with a sibling, a friend or a parent!

2. Brainstorm Designs

- Spend a few minutes trying out different arrangements of cups to get ideas for which design would work best.

3. Build and Test

- As you build, look for ways to make improvements along the way. How high can you go?
- If your tower falls down completely, no worries. Engineers learn from what *isn't* working all the time.
- Have a limited number of cups? Try timing yourself to see how quickly you can build your tower.

4. Evaluate and redesign

- What worked and what didn't? Think about any changes you would like to make using these questions:
 - What happens if the tower base is the same width as the rest of the tower?
 - What if the tower base is a different size and/or shape from other parts of the tower?
 - How can the cups best be arranged to help hold each other in place?
 - How can the cup edges be used to create the most stability?

5. Make Changes and Try Again!

- Try to build your tower even higher.
- If you timed your first build, try to beat your time with a quicker build.
- Or test your design with a different set of materials to see how it affects tower stability.

6. Share Your Results with a teacher, parent/guardian, or DiscoverE!

- You can email photos to DiscoverE at social@DiscoverE.org or post on Instagram/Twitter using the hashtag **#DiscoverEChallenge**