

Newspaper STEM Challenges

Newspaper STEM Challenge 1: Build a Tower

Challenge: Build the tallest freestanding tower with only 2 sheets of newspaper and 12 inches of tape. No wedging or taping to the table or floor! Students can manipulate the newspaper in any way they wish.

Time: 8 – 12 minutes (8 minutes recommended for middle school)

This challenge is actually doable with no tape if you really want to challenge students, but there is a limit to the achievable height. A small amount of tape and newspaper forces teams to wisely use resources and plan ahead. Students (and you) will be amazed at the height only 2 sheets of newspaper can reach! At the end of the challenge, walk around measuring heights and discussing the various designs.



Newspaper STEM Challenge 2: Hold Weight

Time to really test the limits of the newspaper!

Challenge: Using 10 sheets of newspaper and 18 inches of tape, build a tower that holds a textbook 6 inches above the table for at least 3 seconds. The tower be free-standing, which means no taping or holding to the table.

Time: 20 minutes (including testing)

For this challenge, I have a couple copies of the same weighted textbook for testing. As students complete their design, I have a student place the text book on top of the tower. If the book is not at least 6 inches above the table or collapses within 3 seconds, they continue re-designing. If the tower holds, they continue to add other textbooks until failure. This way, everyone is aiming to at least hold the first textbook, but a competition keeps the teams working and designing. I was impressed at all the different designs and approaches to this challenge! Note: depending on group size, you may decide to limit the building phase to 10 minutes, stop the time to test all the designs, and then allow another 10 minutes for re-design following by a second round of testing.

Engineering 101

TAKE THE MARSHMALLOW & TOOTHPICK CHALLENGE!

ENGINEERS START WITH A CHALLENGE:

- How to solve a problem
- How to improve on something that already exists

They review information they already know, think of ideas and imagine solutions, plan something to try, build it and test it, and then think about ways to improve on that!

HERE'S YOUR CHALLENGE:

What is the tallest freestanding structure you can build with

20 MARSHMALLOWS AND 25 TOOTHPICKS?

Start with what you know...

- What shapes can you make with your marshmallows and toothpicks?
- Which of these shapes are strongest? (Wobble them to find out!)
- Think of a plan, and begin building!

Foil Boat Challenge:

How many pennies will your boat hold?

Focus Questions:

*What happens to a full glass of water when you add a bunch of ice cubes to it?

*What happens to a ship when more and more weight is added to it?

Each team will get one square of aluminum foil and as much time as they need to build a foil boat. Test your boats to make sure they float before adding weight. Start adding weight to the boat. Make sure to distribute the weight evenly.

- Place pennies one by one into the boat. Participants can keep track or count along.
- Keep adding weight until the boat sinks.
- Make observations along the way. Does the boat change shape, spring a leak, or lean in one direction? Ask questions to encourage further discovery. Redesign the boat and test again.