

Pasta Tower Challenge

What you'll need

- 40 pieces of spaghetti for each person
- 20 mini-marshmallows for each person

Introduction

Discuss failing: Ask your child if they think failing is bad, and why or why not. Discuss some of the possible consequences of failure in different situations (for example, failing a test in school, or falling while riding a bike, etc.).

Did you know that failing is a pretty important part of the engineering process? Discuss with your child--ask them if they knew that, and why they think it might be important to engineers.

To get an idea why failing is important to engineers, watch this video: "Succeed by failing: Crash course kids" on YouTube: <https://youtu.be/TcUX6eNT2j4>

Summary: Failing is important to engineers, because they can see exactly how the things they make will fail before they are used in the real world. If engineers weren't able to fail before they finished, it could be disastrous, like the example of Galloping Gertie in the video.

Do it!

In the Spaghetti and marshmallow challenge, you and your child will get to experience the engineering process by building prototypes and failing quickly.

Here is the challenge:

- You must build the tallest tower you can with 20 spaghetti and 10 mini marshmallows
- You may break the marshmallows and spaghetti into smaller pieces if you want
- You will have 10 minutes to build your tower (and then 10 more minutes to build another)

Set a timer for 10 minutes, and build some towers!

Note: You can work with your child, or build your own tower.

Once the timer is up, compare towers. If you'd like, measure the towers to see how tall they are.

Discussion and debrief: Discuss these questions with your child:

- What was the hardest part of the challenge?
- What was the easiest part?
- Did something not work like you expected it to?
- How did you fix that?

Now, do another round and build a new tower. Once finished, compare the new and old towers, and discuss some of the new things you and your child tried.

If you like, you can repeat the challenge as many times as your child wants. This helps show kids how repeated testing, failing, and then improving based on the failures can be helpful to engineers.

Once finished, discuss these questions:

- What was something you discovered that you hadn't known before?
- What was the coolest part of this challenge?

Adaptations	Vocabulary	Fun facts
<p>For Younger children Give them more hints and tips on how they might make their tower stronger, for example, that triangles are strong shapes.</p> <p>For An Extra Challenge Add more rules, for example:</p> <ul style="list-style-type: none">• There must be 1 marshmallow on top• The tower must be at least 1 foot tall	<p>Engineering process: The steps engineers and makers take to create something new.</p> <p>Design: What engineers call the plans they make for something they might build.</p>	<p>More videos of Galloping Gertie: You can find videos of Galloping Gertie on YouTube, including when it collapsed!</p> <p>Ted Talk for older kids: Astro Teller, the head of the part of Google that works on projects like driverless cars gave a Ted Talk about why failing is important. It's 15 minutes long and uses complicated words, but might be good for older children: search for "The unexpected benefit of celebrating failure Astro Teller" on YouTube.</p>