

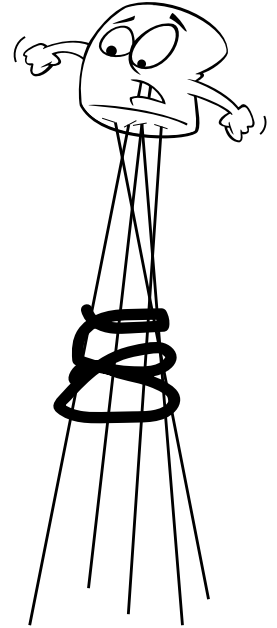
40 minutes

Marshmallow/Spaghetti Challenge

Here's a fun exercise to warm up your brain and build your teamwork skills before you create your prototype.

Design Challenge:

Build the tallest free-standing structure with a marshmallow on top using no more than twenty sticks of spaghetti, three feet of tape, three feet of string, and one marshmallow.



The Rules:

1. The structure is measured from the tabletop surface to the top of the marshmallow. That means the structure cannot be suspended from a higher structure.
2. The entire marshmallow needs to be on the top of the structure. No cutting or eating part of the marshmallow.
3. Teams can use as many or as few of the twenty spaghetti sticks, as much or as little of the string or tape.
4. Teams can break the spaghetti and cut the tape and string.
5. Teams cannot hold on to the structure after time runs out.

Experiment (One):

Build the structure in **ten minutes**.

After building, measure the height of your structure and test if it will support the weight of one marshmallow. The marshmallow must sit firmly on top of your structure. Take photos of your structure and debrief the success of your design process.

Now, **FAIL** on Purpose!



Ask yourselves:

- What would guarantee **failure** in this next round?
- What would I **NEVER** do when building a tower?

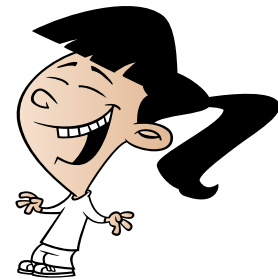
Write down 3-5 outrageous ideas for failure (they can be silly):

Use only one spaghetti stick.

Build it upside down.

Now, pause and laugh—it's part of the process!
Then take each wild or failed idea and ask:

- What lesson is hiding in this?
- How could we turn this idea into a better approach?



Then come up with three ideas for building a more successful structure in Round Two.

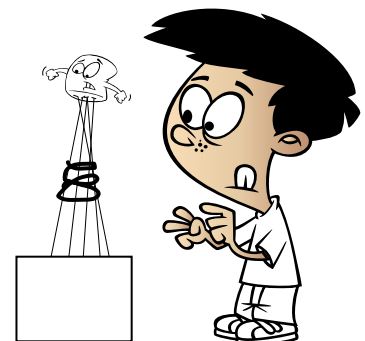
- 1.
- 2.
- 3.

Experiment (Two):

Using your new ideas, build another free-standing structure with a marshmallow on top in just **ten minutes**.

After building, measure the height of your structure and test if it will support the weight of one marshmallow. The marshmallow must sit firmly on top of your structure.

Take photos of your structure.



Analyze:

1. Were both building attempts successful?
2. Which building attempt was taller?
3. Which building attempt used fewer materials?
4. What building techniques made the tower stronger?
5. Does the size of the base alter the strength of the tower?
6. How do you think you worked as a group?

Share:

What did you learn in this exercise to help you build a prototype of your idea?