

## **Elementary Trades and ADST Projects at Home**

**Project:** Marshmallow Challenge

**Time required:** 1 to 2 hours

**Theme:** STEM challenge, ADST and Design Thinking.

This challenge can be done individually with challenges or as a fun collaborative exercise with family and was modified from:

[https://docs.google.com/viewerng/viewer?url=https://kenanfellows.org/wp-content/uploads/2016/05/Marshmallow\\_Challenge.docx&hl=en\\_US](https://docs.google.com/viewerng/viewer?url=https://kenanfellows.org/wp-content/uploads/2016/05/Marshmallow_Challenge.docx&hl=en_US)

This challenge can be used as a lead up to the Skills Canada Spaghetti Bridge Challenge and requires participants to design, build, and test to improve a freestanding tower that supports a marshmallow.

Participants are given 20 minutes to complete each build and are encouraged to try multiple designs to improve on design attempts.

**Grades:** K-3 with assistance, 4-7 as individuals or small groups.

### **Tools and Materials:**

(Participants will need the following materials for each build that is attempted)

- 30 pieces of uncooked spaghetti
- 1 meter of string
- 1 meter of masking tape
- 1 large marshmallow

(Participants will need the following for the duration of the challenge)

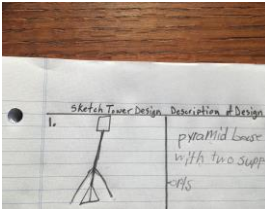
- pencil and paper for design and reflection
- tape measure
- scissors

## **Procedure:**

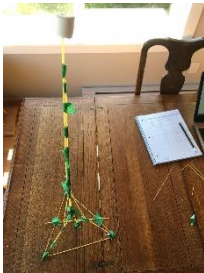
1. Gather materials. A reminder that 30 pieces of uncooked spaghetti, 1 meter of string, 1 meter of masking tape, and 1 large marshmallow will be required for each build attempt.



2. Begin with the design and sketch of the tower to be built during this first attempt. Use the space provided in the Recording Chart on page 4, or substitute pencil and paper to draw a similar chart if you decide not to print this document. Draw and describe the design features in this build attempt with approximate dimensions. Separate pieces of spaghetti and materials to be used can also be labeled.



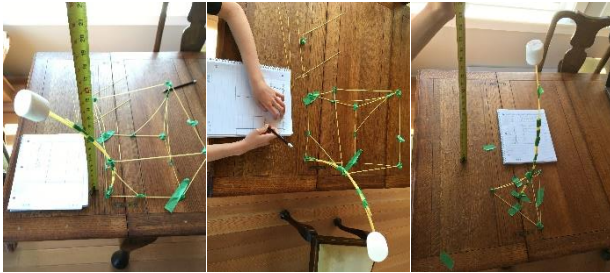
3. Begin a 20 minute timer before building the tower and mounting the marshmallow at the highest point.



4. Measure the tower from the work surface to the tallest point and record in the chart. If a tower fails it can still be measured and recorded.



- Repeat steps 1-4 for at least two more attempts and try different base types.



## **Extensions:**

- Research the tallest structures in the world.  
[https://en.wikipedia.org/wiki/List\\_of\\_tallest\\_structures](https://en.wikipedia.org/wiki/List_of_tallest_structures)
- Attempt a new design with information learned through previous attempts and research.

## **Reflection questions:**

1. Which base type worked best for you? Why do you think it worked better than the others?
2. Did your plan change as you were building? If so, why was it necessary to build a tower different than you had designed?
3. Did you use all materials for each attempt? Would it help to have more of one or more materials? Which materials would you choose to use more of? Why?
4. What are three important things you learned while working on this challenge?

## **Assessment:**

Discuss reflection questions and present findings to other participants.

Refer to <https://www.rcampus.com/rubricshowc.cfm?code=UX3B785&sp=yes&> for an assessment rubric specifically designed by Rcampus for the Marshmallow Challenge

## **Resources and Links:**

<https://static1.squarespace.com/static/57c6b79629687fde090a0fdd/t/58ab5a6046c3c4e069a2842d/1487624802348/SpaghettiMarshmallow.pdf> (modified from this lesson)

<https://www.common sense.org/education/lesson-plans/the-marshmallow-challenge> (modified from this lesson)

[https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/curriculum/continuous-views/en\\_ADST\\_k-9\\_big\\_ideas.pdf](https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/curriculum/continuous-views/en_ADST_k-9_big_ideas.pdf) (BC's ADST Curriculum)

[https://en.wikipedia.org/wiki/List\\_of\\_tallest\\_structures](https://en.wikipedia.org/wiki/List_of_tallest_structures) (World's tallest structures)

Marshmallow Challenge Recording Chart

Sketch Tower Design

Description of Design

Success (Y/N)

Height

1.			
2.			
3.			

