



Lesson Time: 15–20 minutes

## Design Challenge

### Objectives & Outcomes

**Lesson Objectives:** Students will learn participate in a hands-on design challenge.

**Lesson Outcomes:** *Students will be able to...*

- brainstorm ways to build a tower out of straws and tape
- collaborate and work as a team

**Subject Area Connection:** Engineering

### Background

Who doesn't love a challenge? Real-world design challenges are an opportunity for groups of people to work together as collaborative teams to solve a problem, often in a timed setting. During these projects, students must learn to negotiate, problem solve, think critically, and work together with their peers.

“Who doesn't **love a challenge?** ”

### Introduction and Modeling

Begin the lesson by telling the students that they are going to participate in a real-world challenge. Show them the box of straws and tape and instruct them that their team will have 20 minutes to build a freestanding structure. The goal is to make the tallest, most stable structure possible. An option is to have students place one marshmallow on the top of the structure.

### Getting Ready

**Teacher Preparation:** To prepare for this lesson, set up stations for the student teams.

**Materials Required:**

- 20 drinking straws per team
- 1 roll of masking tape per team
- marshmallow (optional)
- clock or timer

### Key Vocabulary

**design challenge:** a real-world team project.

## Procedure

1. Place students in teams of 4 students.
2. Hand out 20 straws and one roll of tape to each team. (marshmallow optional)
3. Allow the students to begin working. Keep track of the time and call "stop" at the end of 20 minutes.
4. Look at all the towers and choose a winner!

## Discussion Questions

- What was the most difficult part of the challenge?
- What did you learn from this activity?
- What would you do differently if you were to do this activity again?

## Evaluation

Ask each team to create a list of "dos and don'ts" for this challenge.

\*adapted from The Marshmallow Challenge

## Tips for Tailoring this Lesson

### For Higher Grade Levels

- Ask students to perform the challenge with dry spaghetti and string in place of the straws.
- Challenge students to balance an egg on top of the marshmallow at the top of the structure.

### For Lower Grade Levels

- Give students more time for the challenge.
- Allow students to create a structure out of 20 straws, 20 marshmallows, and tape.

## Alignment to Standards and Frameworks

### Common Core State Standards:

#### College & Career Readiness

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#### Anchor Standards for Speaking and Listening

**CCRA.SL.1** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

### Next Generation Science Standards

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#### MS-ETS1-2

Evaluate the competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.