



# Play-Doh STEM

## Use Play-Doh to Complete a Monster and Toothpick Tower Challenge

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# Introduction

This kit includes instructions for two different Play-Doh STEM challenges with a BONUS challenge at the end.

Play-Doh Monster Challenge- A parameter is something that defines operation, in this challenge it will define what supplies are needed to make a monster. In the lesson youth will be given two different sets of parameters to follow for creating two different monsters. Beyond the parameters, imagination is a key factor in creating the monsters.

Play-doh Tower-Two different tower challenges are given in this lesson. While creating the towers youth will need to follow the basic engineering design process: Identify, Brainstorm, Design, Create/Build, Test, Evaluate the product, Redesign the product, and then Share the solution or design. Youth will start by identifying the problem. With this project, youth will read the specific challenge. The next step is to brainstorm or think of as many ideas as possible to build a tower within the guidelines. Youth will then choose the design they think will work best. Next, youth will create or build their tower. That is not the end though, the only way to know if the design works is to test it! If it does not work or needs improvement, youth have the opportunity to redesign the project. This process can repeat many times until youth are satisfied with their results. Finally, youth can share their tower with someone else.

## Objectives

After completing both of the challenges youth will have a basic understanding of how to follow parameters and how to create a tower following the engineering design process.

## Supply List

- Instructions
- 2 Containers of Play-Doh
- Toothpicks
- Pipe Cleaners
- Feathers
- Googly Eyes

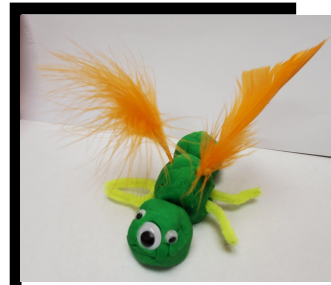
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**Do:**

## Monster Creation #1

Monster 1

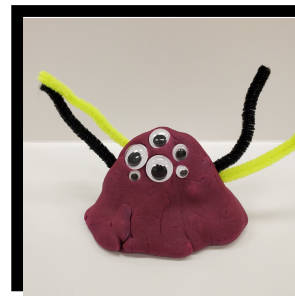
1. Build a monster following the following parameters:  
The completed monster must have at least 3 eyes, 1 feather, 2 pipe cleaners, and Play-Doh. Your monster must stand independently.
2. Remember, in construction you should follow the parameters, but you can also use your imagination.



## Monster Creation #2

Monster 2

1. Build a monster following these parameters:  
The completed monster must have at least one eye, 4 pipe cleaners, and stand on its own.



## Reflect

- Was it hard to follow the parameters given?
- Were you able to make more than one monster with the same parameters? Did they all look the same? Why not?



## Apply

- Try making a monster with a friend, both of you following the same parameters. Admire the differences in the monsters.
- Make up parameters for someone else to follow.
- A recipe gives you parameters on how to make something. Try making a recipe, but be sure to follow the parameters closely.



# Tower Challenges

Follow the basic engineering design process:

Identify the problem: What is the challenge? (see tower challenges 1, 2, and bonus challenge)

Brainstorm:

1. Before engineering the tower, brainstorm all the different ways you could make a tower. Imagine how you can attach the toothpicks together using the play-doh. Think about different 3-Dimensional (3-D) structures to see which might be the best one to use when constructing the tower. The more ideas the better.

Design:

1. Now it's time to take the best solution and plan how it will be built.

## Tower Challenge #1

Build:

Tower Challenge #1

1. Build the highest tower you can that is free standing, or stands on its own. How high is it?

Test, Evaluate, and Redesign:

1. What techniques did you use to make your tower stand on its own? What could you improve?
2. After analyzing your tower, try building it again. Were you able to make a taller tower?

## Tower Challenge #2

Build:

Tower Challenge #2

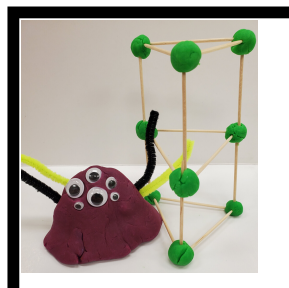
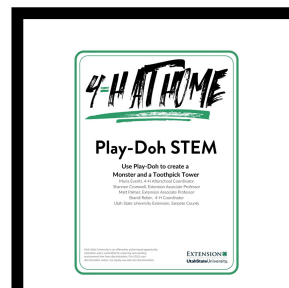
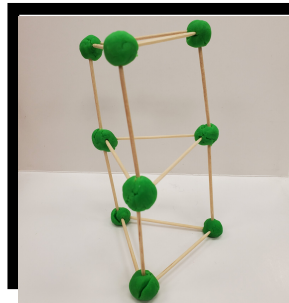
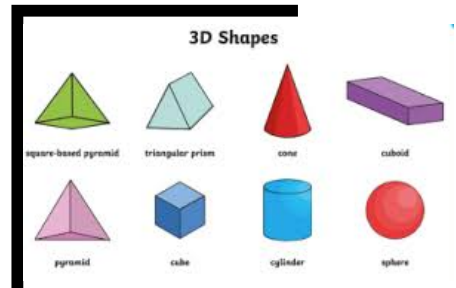
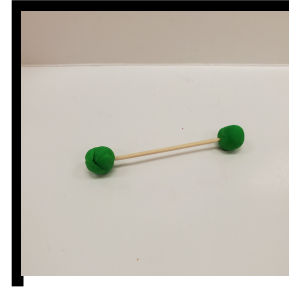
1. Build a tower at least three toothpicks tall that will support three sheets of paper. You can even use the Play-Doh Stem Lesson Plan.

Test, Evaluate, and Redesign:

1. Were you able to do it on your first try? If not, try different types of structures until you can do it.

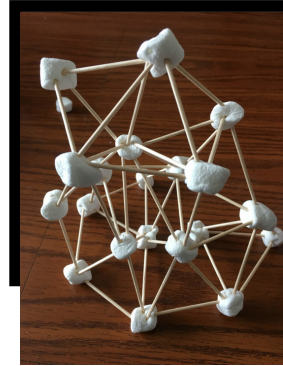
## BONUS Challenge

1. Try to build a tower at least two toothpicks high that will support your Play-Doh monster on the top.



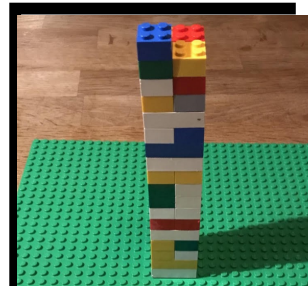
## Reflect

- Was it hard to engineer the towers?
- Was it helpful to be able to see the weaknesses with the tower and try constructing it again?
- Do you think it would be easier to do this challenge with marshmallows instead of Play-Doh? Why or why not?
- How was the engineering design process helpful in creating a tower?



## Apply

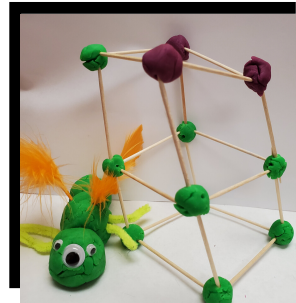
- Have tower building challenges with family and friends. Who can build the highest tower, or who can build a tower that holds the most weight?
- Try engineering towers with other materials. Use blocks, Legos, paper, tape or other items you may have at your house.



## Final Product

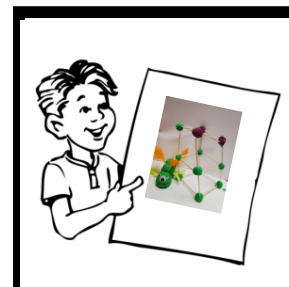
Share: The final step in the engineering design process is to Share, show someone your amazing tower!

Your final products (monsters and towers) in this kit can be taken apart and used over and over again. See how many ways you can make them. Plan ahead and learn from your weaknesses. There are no mistakes, only opportunities to learn.



## Mastery

- Take pictures of your monsters and tower challenges and make a poster to in the local County Fair that explains the engineering process.



## For additional Help

Please watch our tutorial on You Tube:

[https://www.youtube.com/channel/UC\\_h3xuBMm9UzppX-T\\_BxcFA](https://www.youtube.com/channel/UC_h3xuBMm9UzppX-T_BxcFA)

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