

Here are some great activities to keep your child entertained and learning during this strange time. These activities are all STEM (science, technology, engineering, mathematics) related!

Marshmallow Tower Competition

The goal of this challenge is to see who can build the tallest tower out of spaghetti and tape. The tower must be able to support a marshmallow at its peak. This activity teaches kids about structures, and what makes some structures better than others. For example, kids will see that a sturdy base is very important in their tower not falling over. They will see that if they reinforce their spaghetti pieces near the base of their tower they will have an easier time building it higher. They will see that it is important that they take time to make sure that their joints are all sturdy.

Each kid (or team) should get:

- 20 spaghetti noodles
- 1 yard of tape
- 1 marshmallow

Each kid will then get 20 minutes to create their structure. The structures cannot be taped to the table or surface that the kid is working on. When their tower is complete, they must place a marshmallow at the top, and their tower must be able to withstand the weight of the marshmallow without falling over. Other than that, kids are free to be as creative as they would like in designing their bridge. It may be smart to encourage your child to first think about or even draw their design on paper before beginning crafting. They don't have much time so they want to be efficient once they start building!

After towers are complete, here are some things to think about, and some questions to ask:

- What challenges did you encounter in the marshmallow challenge?
- What did you notice worked well in terms of design?
- What worked differently from what you thought would work?

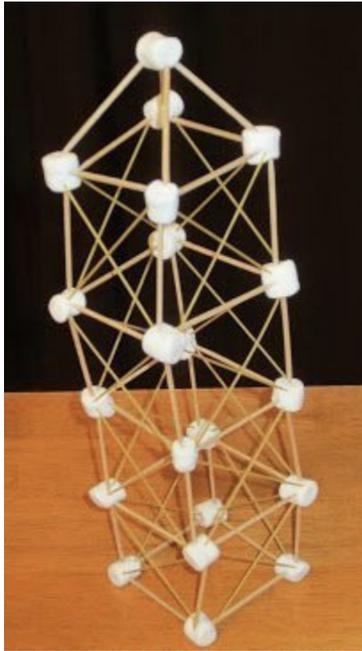
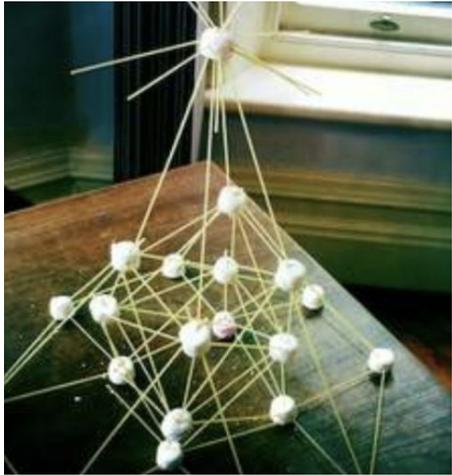
This activity aligns with what some engineers do in the real world, specifically civil engineers. They think about these same design principles that one has to keep in mind as they do the spaghetti challenge. If your child liked this challenge, encourage them to look more into what a civil engineer does! They help design everything from bridges to roads to buildings, and more.

Some variations to the activity:

- Supply your child with more spaghetti and tape to allow them to build their tower higher
- Give your child more time to craft so they can think about their design more
- Allow your child to complete the activity multiple times, so they can improve upon their past ideas
- Can their tower hold 2 marshmallows at the top? 3???

Here are some potential designs that have been done in the past. These could be used to inspire your child as they begin brainstorming, or to compare to your child's final design when they are done.

NOTE: These designs use slightly different materials, but the structural ideas are the same.



Make Your Own Volcano!

The goal of this workshop is to expose students to chemical reactions in a hands-on, involved way. This activity teaches kids about how chemical reactions form, allowing them to witness it with their own eyes! It also teaches them about proportions within chemical reactions, and how adding more of one component might change things up. For example, the amount of baking soda used might make the volcano shoot up more/less lava! This activity is also a fun way for kids to learn more about volcanoes.

What You Need:

- Baking Soda
- Vinegar
- Dish Soap
- A few drops of orange or red food coloring (not necessary)
- Tape
- Tinfoil
- Paper Plate
- Dixie cup

First, students should take the paper plate and draw a circle in the middle with a diagonal line connecting the circle to the end of the plate. Students should then cut this line so that the plate can be propped up in the shape of a volcano, as well as cut the hole out to form the top of the volcano. Students can decorate this plate if they wish to personalize their volcano!



Next, in the dixie cup, the experiment will take place! Add two spoonfuls of baking soda, one spoonful of dish soap, and 5 drops of food coloring. Then, students can prop the decorated plate around the dixie cup, with the dixie cup directly under the hole with the plate wrapped around it. Add about an ounce of the vinegar and watch your volcano explode!



Allow your child to make another volcano and play around with the proportions of ingredients used to think like a scientist! Each ingredient contributes a certain aspect to the volcano's explosion.

Here are some fun facts to share with your child about volcanoes:

- The danger area around a volcano covers about a 20-mile radius
- The ash can cause damage to the lungs of older people, babies and people with respiratory problems
- More than 80% of the earth's surface is volcanic in origin. The seafloor and some mountains were formed by countless volcanic eruptions
- There are more than 500 active volcanoes in the world
- Active volcanoes in the U.S. are found mainly in Hawaii, Alaska, California, Oregon and Washington
- Three quarters of all eruptions happen underneath the ocean
- the tallest volcano in the Solar System isn't on Earth at all, but on Mars. Olympus Mons, on Mars, is a giant shield volcano that rises to an elevation of 27 km, and it measures 550 km across

Egg Drop

This workshop is a great way for your child to have fun while considering physics concepts- all while using common household items! Through this activity, students get to build an egg drop, with the goal of dropping their egg from a certain height without it breaking! Kids will have to think through how they can best protect their egg and utilize different materials to add extra layers, reduce the speed at which the egg travels at, and provide a cushion.

Other than an egg, the supplies necessary are flexible! Whatever you have laying around in your household will do. Here are some ideas:

- Toothpicks
- String
- Paperclips
- Cereal Boxes
- Rope
- Newspaper
- Rubber bands
- Tape
- Cotton
- Balloons
- Plastic Bag

Before beginning, here are some concepts kids can keep in mind when building their egg drop:

- Gravity: the force that pulls you, or any object on earth down to the ground
- Free Fall: when something is falling to earth, it continues to speed up until it hits the ground.
- Air Resistance: when an object falls, air resistance will help to slow it down.
 - Drop a piece of paper next to a crumpled piece of paper. Regular paper “catches air” as it falls and falls slower than the crumpled piece of paper.
- Force: dropping an egg on concrete vs. trampoline will have a difference on what happens to the egg
 - Adding a ‘cushion’ or layers around the egg drop may imitate a softer surface/ force

Kids' egg drops need to find a way to resist the force of gravity. Finding ways to slow falling objects down is something that engineers are always attempting to figure out! This is a great way to have your child think like an engineer and build a 'prototype'.

With the concepts above in mind, kids can begin to build their egg drop! To make it more challenging, give students a certain time frame to complete this process in- around 30 minutes is plenty! Also, limit the amount of supplies they can obtain in order to have them thinking about what is important! You can make each supply a certain amount of 'money' and give students a certain budget to spend. This will get them to really think and prioritize.

Below is a great sample to use, with students being given \$100 'spend'.

Material	Cost (\$)	Quantity	Cost x Quantity
1 Toothpick	2		
1 Paperclip	2		
1 Straw	3		
1 String (12")	3		
1 Cotton Ball	5		
1 Pipe Cleaner	5		
1 Rubber band	5		
1 Sheet of Paper	6		
1 Paper Plate	15		
1 Set of Newspaper	20		
1 Piece of Cardboard	20		
1 Balloon	20		
Total Cost =			

Here are some great examples of creative egg drops!



After students' are done building their egg drop, it's time to test their creation! Drop their egg drops either from a balcony or out of a window on a second floor! Happy egg drop!

Hour of Code

From computers to phones to cars to vacuums, code is found everywhere in our world. Code is a language that computers are able to read and then do stuff with, such as adding $2 + 2$, printing "hello world" onto the screen, or telling your car to stop at a red light. Code is amazing and found in almost everything we do.

There is a great organization that has put together an "hour of code", where kids of all ages can go and code for an hour, picking out an activity that interests them. The link to all of these activities are found below.

<https://hourofcode.com/us/learn>

Happy coding!

Freerice

Freerice is an educational trivia game that donates to World Food Programme (WFP) as questions are answered. Users can pick questions from a number of categories, such as

- Multiplication Table
- Basic Math (Pre-Algebra)
- Human Anatomy
- Chemical Symbols (Basic)
- Chemical Symbols (Full List)
- And many more.... Including geography, languages, etc. (stem and non-stem related)

Pick your category and begin playing!

<https://freerice.com/categories>

