

TECHFEST

EGGCITING EXPERIMENTS

Even though the Easter holidays feel a little different this year, there are still lots of amazing activities that you can do from the comfort of your own home. We've made a list of our favourite fun-filled and easy to set up Easter inspired STEM activities. Hours of fun for the whole family!

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THE UNBREAKABLE EGG

**Eggshells are pretty
fragile right?**



If you've ever dropped one you know it doesn't take much force for that egg to splatter everywhere. But what if I was to tell you that eggs are actually stronger than you? If you were to squeeze an egg on the top and bottom, I bet you won't be able to break the egg. Go on and try it, I dare you!

So just how strong are eggs?
Well, let's do an experiment to find out.

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What you will need:

- Eggs (at least 1)
- Plastic bottle-caps (2 per egg)
- Heavy items to place on top of eggs
- Carboard

Step 1

Give each egg a bottlecap top and bottom. The bottle-caps stop the egg from rolling away and allows us to stack things on top.



Step 2

Try balancing a book on top of your egg. Can it hold the weight? See how heavy you can make it while still keeping your egg intact.



Step 3

Lets take it up a notch! Place three eggs (each with top and bottom bottlecaps) in a triangle and place a piece of carboard on top. How much weight are you able to stack on top without breaking the eggs? Get in touch and let us know

The Science Behind it!

So why are eggs so strong? Any guesses? All right I'll tell you - the answer lies in their dome shape. When we apply weight to the top of the egg, the dome shape causes the pressure to be evenly distributed all over the shell, rather than concentrating it at any one point. However, eggs do not stand up well to uneven forces, which is why they crack easily when you push on just one side (or why it cracks on the side of a bowl).

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COLOURED EGGS



An oldie but a goodie!

Dyeing eggs is a classic Easter tradition but have you ever considered the science behind the fun?

We will talk you through the basic principle below but feel free to get as creative as you like with your egg decorating!

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What you will need:

- Eggs you will need to blow* • Heatproof bowl, cups or jars
- Food colouring
- Vinegar
- *how to blow out eggs <https://www.wikihow.com/Blow-Out-Eggs>

Step 1

In a jar or bowl, mix a teaspoon of food colouring (or more if you want the colour to be more intense!), a tbsp of vinegar and enough warm water to cover the egg.



Step 2

Lower the egg into the dye carefully (if the egg is blown you could use a chopstick or pencil to pin the egg underwater) until fully submerged. Play around with different timings until you get the colour you desire.

Step 3

To create different tints, vary the dipping time. Using tongs makes handling the eggs easy. And if you want to get fancy, you could try making patterned eggs! Try wrapping elastic bands around your eggs before you dip them. Once the egg is completely dry you can remove the bands and voila - Stripes!

Want to up your egg game?

Try cutting out shapes and sticking them on your egg before dyeing. Or you could even use wax crayons to draw intricate patterns. We would love to see your beautiful creations, so make sure you send us a photo!

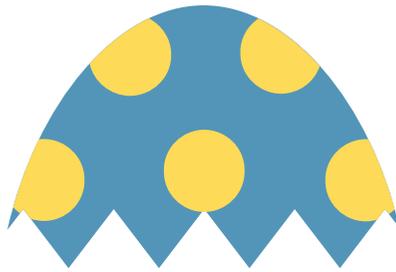


The Science Behind it!

So what's the science behind the dying process? And why did we need to add the vinegar to the dye? Aren't eggs stinky enough without us having to add vinegar as well? But it turns out, food colourings are acid-based dyes, so only work really well in acidic conditions. The vinegar, which is acidic, is necessary to bring the pH low enough that the dye will work optimally and stick to the eggshell.

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THE EGG DROP CHALLENGE

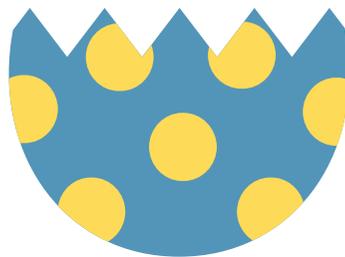


The Ultimate Egg Engineering Challenge

The mission is to create a container that will protect an egg from breaking from a high fall

You can make this challenge as simple or complex as you want depending on the materials you have available

Many an egg has been sacrificed in this ultimate challenge. Will you be able to save yours?



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What you will need:

- Newspaper
- Shoebox
- Ice lolly sticks
- Sellotape
- Rubber Bands
- Egg boxes
- Plastic Bags
- Straws
- String
- Balloons
- Packing Peanuts

Follow these instructions for the Egg Drop Challenge. Be sure to tag us in any photos or videos you take of the activities!

STEP 1

Design your egg container

Have a think. Will it have a parachute, or will it bounce or have lots of padding?

Tip: Try drawing your design out first. Here are some ideas for inspiration - <https://www.pinterest.co.uk/mystvamp3/egg-drop-ideas/>

STEP 2

Build your own container using whatever materials you have available

STEP 3

Have a practice run

Drop your container from a low height. Do you think it will protect your egg? if not, go back and make some adjustments to your container

STEP 4

Time for the real thing!

Place your egg in your container and drop from a high height (remember to be safe - get a grown up to help you with this part)

STEP 5

Check your egg for casualties!

Has it been smashed to smithereens or did it survive?

If you were successful and your eggs are intact, you could try dropping it from an even further height. How high do you dare to go!



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THE EGG CATAPULT



What could be more fun than flying eggs?!

Each member of the family is challenged to design an egg catapult!

Although best to use the plastic type. The family member that manages to launch their (plastic) egg the furthest wins!

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WHAT YOU WILL NEED:

- Plastic Eggs
- Measuring Tape
- Space to create a landing zone
- Materials for your catapult (you can use whatever you have around the house) examples: Rubber bands, plastic spoons, clothes pegs, bits of pipe, cardboard tubes, balloons, straws

Follow these instructions for the Egg Catapult. Be sure to tag us in any photos or videos you take of the activities!



STEP 1

Each member of the family designs their own catapult egg (or you can work together as a team)

Tip: Try drawing your design before building (use the photos for some inspiration)

STEP 2

Build your catapult using whatever materials you have available

STEP 3

Have a few practice shots. Is there any way you can improve your design? If so, make the adjustments.

STEP 4

Set up your landing zone

Clear a space and set up your tape measure so you can record the distance the eggs travel

Tip: You might want to do this in the garden.

STEP 5

Take it in turns to launch your eggs. Whoever's egg travels the furthest distance wins!



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PHOTO CREDITS

[HTTPS://WWW.ALLTHINGSMAMMA.COM/HOW-TO-DYE-EASTER-EGGS-AND-GET-VIBRANT-COLORS/](https://www.allthingsmamma.com/how-to-dye-easter-eggs-and-get-vibrant-colors/)

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