



Minds in Motion

It's Raining Eggs



Activity Rundown:

This is your chance to break some eggs at home! Hopefully, if done correctly, you won't make a mess. One of this week's activities will include you launching your eggs from the highest point you can find in your home or even outside! You will try and protect this egg at all costs in hopes you don't make a mess that you have to clean up. Good luck!

You will need: (Many of these are optional and are included in case you have them at home. Otherwise use anything you can find!)

- + Eggs (can use a cup of water as a replacement)
- + Styrofoam
- + Cardboard
- + Paper
- + Tape
- + Glue
- + Bubble wrap
- + Elastics
- + Garbage bags
- + Anything you might think of!



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Let's do it!

- 1) The first part of your mission will include locating the highest but also safest point that you will be allowed to drop your egg from. Please ask permission during this portion of the experiment.
- 2) Next you will get ready to create two separate designs for your egg drop challenge.
- 3) First you will create a design for your egg that will keep it safe using any amount of materials you see fit.
- 4) Be sure to draw out your design as well as include a list of materials that you will be using to keep your egg safe.
- 5) Once you feel your design is complete you may begin the building process.
- 6) Refer to the "background" section of this write up for some information that may help with your design!
- 7) Once you have completed your build you may go to the destination you marked earlier to go ahead with your testing! During this portion lay down a few garbage bags, tarp, or towels in the spot you feel your egg will land. (Hopefully this helps with the mess if needed)
- 8) Let us know in the feedback portion or on social media as to how it went!**
- 9) Your second challenge is an addition to your initial design challenge. If you were successful in completing the first drop your next mission is to minimize the amount of materials used in your next design!
- 10) Look at the materials you used in your first prototype and think about where materials were wasted. Where can you cut back or redesign what you've built to make it better?
- 11) This is good practice for any experiment or design challenge you do in the future!





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Background:

Newton's Laws of Motion, Force/Mass/Acceleration, and the Conservation of Energy:

- The science behind solving the falling egg "problem" is found in Sir Isaac Newton's laws of motion. The first law states that an object at rest will stay at rest, and an object in motion will stay in motion, unless acted upon by an external unbalanced force. This law means that if the forces acting on a falling egg are equal, it will remain in its current state of motion. If a force greater than those acting on the egg is applied, it will accelerate. "Acceleration" means any change in velocity -- slowing down, speeding up or changing direction. If you hold an egg, the forces you are applying are equal and balanced, canceling out the force of gravity. Therefore, it remains motionless in your hand. If you let go of the egg, gravity becomes an unbalanced force and causes the egg to fall to the ground.
- Newton's second law deals with the relationship between an object's mass, its acceleration and the amount of force it exerts. The heavier an object is, and the faster it is traveling, the more force it exerts. Gravity causes falling objects to accelerate at a rate of 32.2 feet per second squared. By reducing the amount of mass in the egg container, you are reducing the amount of force it exerts as it falls.
- The law of conservation of energy helps understand how to mitigate the effect of an egg that is falling to the ground. Energy can neither be created or destroyed, only transferred. When an object falls to the ground, some of its energy is transferred to the ground, while it retains some energy. This is why a ball may bounce lower and lower each time. Eventually, the kinetic energy dissipates and the ball stops bouncing. By understanding that kinetic energy from a fall can be diminished over time, students can attempt to minimize the force of impact from a falling egg by using materials that allow for a bounce.



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Reach out!

We would love to hear from you about all the amazing STEM projects you are doing at home! Show us your finished products on any of the following social media platforms by tagging us or by using the following hashtags. We hope these projects have brought some excitement to your day during these difficult times.

Let us know how we did! Please [click here](#) to fill out a short survey on how well we did and what you would like to see more of in the future. Thank you!

Twitter: **@MyMindsInMotion**

Facebook: **@mindsinotion2014 & @ucactiveliving**

Instagram: **@ucalgaryactive**

Please use the following hashtags!

#ucalgarycamps #ucalgarytogether