

# *Egg Drop Experiment:*

## *Physics Experiment*

### *Background Information:*

In this experiment we will be looking at 2 different concepts: Gravity and Drag. If you have ever studied gravity, you probably have heard about Isaac Newton, a physicist that came up with the concept while observing a falling apple. Gravity is a pull towards the earth's core that objects, like humans or apples, feel and it helps us not float off into space. When Isaac Newton observed the apple falling from the tree, he was watching gravity's affect on the apple. The apple fell down to the earth's surface because gravity was pushing it down. During this egg drop we will be dropping a home-made structure with an egg in it to see if we can find a design that will prevent an egg from being broken due to gravity. When we drop it from high up, we will see gravity acting on our structure and it accelerate to the ground. The second force we will be studying is drag. Drag is a force acting opposite to the direction of motion of the object. If something is dropping down to the ground, drag is acting in the opposite direction and is going up. This means that when we drop an egg, gravity is pushing it towards the ground and drag is pushing up on the egg. In our experiment we want to maximize drag by increasing the surface area to volume ratio of our egg drop structure. Having a larger surface area to volume ratio means we want the structure to be wide but not heavy. This will mean that there will be more drag on the structure and it will go against gravity, helping save our eggs from cracking when they hit the ground.

### *Materials:*

Be creative -- These are recommended materials but you want to have your own take on the experiment. Have fun and try to use your imagination on what kind of structure you want to make. You can use a variation of these materials or none at all and go your own route.

1. To reduce drag → look for things that can mimic a parachute
  - a. Plastic bag, toy parachute
2. Popsicle sticks
3. Glue
4. Rubber bands
5. Styrofoam pieces
6. Balloons (or rubber gloves)
7. Tape
8. Scissors
9. Shoe Box

### *Experimental Steps:*

### Adult Supervision needed

1. Design your experiment: you will likely need a structure to hold the egg, something that cushions the fall so that the egg doesn't break inside the structure, and a parachute (plastic bag)
  - a. Try to look around your house for materials you already have and have fun. You can look online for inspiration but try to make it your own creation
2. Build! Build! Build! - time to take your design and turn it into a real life egg drop structure. This part is the hardest but don't be afraid to get creative with materials. When I was creating mine I used glue and rubber bands to hold things together but you can also use tape or a box that already has a closed top.
3. Drop from high up: ask your parents to help you. You can use a chair or have your parents stand on the roof. Test how well your experiment went by increasing the height of the drop so you can see the parachute engage.

*Here are some ideas of egg drop structures to be inspired by. Try not to copy them exactly but find a structure that you find the coolest and make it your own.*

