

## Egg Drop Competition

Your goal is to design a contraption that will allow an egg to fall slowly as well as land softly. You will drop the egg from a minimum of 2 meters initially. If it survives you will get to prove your scientific genius by moving on to the next level which is at a minimum of 6 meters (halfway up the bleachers). If it survives the second drop you are genuinely an Einstein and will get the opportunity to really demonstrate your skills by dropping it off of the bleachers. Some of you need extra credit, therefore if your egg survives the first fall you will get 10 points, if it survives the second try you will get 20 points, and if it survives the last time you will get 30 points. The bonus round will be your teacher throwing the contraption down to increase its velocity. If you survive this round you will get 50 points and my utmost respect.

To be successful you need to have a basic understanding of physics. The moment the egg is dropped there are forces acting upon it. You will see velocity, inertia, free fall, momentum, acceleration, and gravity in action. Your design will need to be able to manipulate these forces.

- Newton's first law: A moving object continues to move with the same speed and in the same direction unless acted on by an unbalanced force. Figure out how to create an unbalanced force against gravity..
- Speed/velocity describes how fast an object is moving and in which direction. Figure out how to slow your egg's velocity.
- Acceleration is the rate at which an object speeds up or slows down. Without any contraption, the egg will accelerate at  $9.8 \text{ m/s}^2$ . That is pretty fast. You will need to slow the acceleration down.
- Gravity is the force that will cause your egg to accelerate.

You will create your contraption using 4 items from the following list with 1 to 3 others. Make an idea first before deciding what from the list you will use. You will not be able to trade.

10 straws	4 napkins	1 garbage bag/plastic bag	4 rubber bands	1 cup
2 papers	4 cotton balls	2 bowls	1 plate	1 meter of string
100 cm <sup>2</sup> of bubble wrap	4 tissues	1 coffee filter	1 meter of toilet paper	1 Balloon

All groups will get an egg, 1 meter of masking tape, and a ziplock bag to place your egg into. Your egg must be easily set and secured into your contraption and be visible so that any crack can be observed..

1. What are the four items that you chose to use?
2. Describe how your contraption will slow the acceleration, velocity, and counterbalance gravity.
3. If you could redo this experiment, using the same material that you have chosen, how would you go about making it better?