

# The Egg Drop Project

## Objective

An egg drop project has a lot to do with physics! Physics deals with properties, changes, movements (and so on), of matter and energy. An egg is made of matter, it moves when it drops, and it may break when it hits. You need to rely on your knowledge of physics and Newton's Laws of Motion when designing and building your contraption to avoid breaking the egg when a large force is applied to it.

## Container Design

The container you design will have to house one egg. The egg will be inserted at school and will be provided by me. In building the container, you and your partner should think about how the energy is converted from potential energy to kinetic energy, and the work done on the container and the work done on the egg. Remember . . . for every action there is an equal but opposite reaction!

## What is Involved?

This experiment involves dropping an egg in a container from a height of more than 30 feet. The container can be made of material of the designer's choice but may not include anything listed on the "banned material" list below. There must be an opening so that an egg can be inserted by me the day of the drop. The final result you want is an egg that survives the drop.

## Rules and Banned Materials

1. The VUSD maintenance workers will be doing the dropping. They can throw it any way they want!
2. No balloons or parachutes are allowed.
3. Your egg drop project must fit on top of your desk without any part hanging over. Approximately 18" by 24", and be no taller than 26".
4. The project cannot weigh more than 6 pounds.
5. You may not use nerf balls, pillows, diapers, packing peanuts, or stuffed animals.
6. Once a project has hit the ground, it is your responsibility to retrieve your egg and show it to me for scoring.
7. You may work alone or with **ONE** partner (no groups).
8. You may only use **12 inches** of tape in the design of your project. Any type of tape is allowed.

*Why did the egg go to school.  
To get egg-ucated.*

*...lol...*

*Aren't my yolks egg-cellent*

## Requirements for the Project

### Report (45 points)

1. List of materials you would like to use for your container. (5 Points)
2. **Detailed** drawing or diagram of what your container will look like. Include color! (10 Points)
3. Create a drawing that uses arrows and labels to describe the forces that are involved in the drop. (10 points)
4. Written portion is at least a minimum of 1.5-2 pages double-spaced or 1 page single-spaced, and no larger than a 12 point font with one-inch margins. (20 Points)
  - Written portion includes (**before the drop**)...
    - Procedure for how you built your container and explain your theory for why you think it will work
    - Include concepts of motion and forces. How will the forces help or hurt your project?
    - Discuss the physics involved in a free fall (remember free fall means no air!) – include how and why distance, velocity, and acceleration do or do not change.
    - Discuss the effect air resistance has on the fall of an object.
    - Describe the fall in terms of **each** of Newton's Laws.
    - Describing **the landing** in terms of **each** of Newton's Laws.
  - Written portion includes (**after the drop**)...
    - What was the final result? Did your egg survive?
    - What would you improve the design?

### Container (25 points)

Build your container. Creativity and ingenuity will help a lot on your grade. Although, the end result of the egg surviving is the most important aspect to remember.

### Grading Scale For Drop Only (10-30 points)

30 Points – Egg survives the fall fully intact

20 Points – Egg is cracked, but intact

10 Points – Egg is broken

**Written Report + Egg Survival = 100 points**

**The drop will take place on Thursday, December 20<sup>th</sup>.**

**No late assignments!**

**Written portion is due on December 21<sup>st</sup>.**

