

Name \_\_\_\_\_  
Intro to Engineering  
Period \_\_\_\_\_

Date \_\_\_\_\_  
Egg Drop  
Mr. Moy

## Egg Drop

### The Challenge

Your task is to design, build and describe the performance of an egg safety container that will allow an egg to survive a fall from the ceiling. In the spirit of all three of Newton's laws and momentum, design a container to HOLD an egg such that the container can be dropped from the ceiling onto the hard, unforgiving floor without the egg being broken.

### Rules

- You may use only the supplies provided. If the container is non-compliant with specifications it will result in a penalty (loss of points)
- You will be creating a detailed schematic/diagram of your container (you can make a quick sketch for reference first).
- **Materials** - You will not be given extras of any materials. ***Plan before you build.***
  - 2 pieces of computer paper
  - 20 straws
  - 20 toothpicks
  - 1 meter of scotch tape
  - tacky glue
- You may not tape the egg shut.
- You will only have the time allowed and no more. If you do not present your container when requested, it will result in a penalty.
- You must be able to prove your egg is intact. **Make sure that you can extract your egg from your device without destroying your container.**

### The Point System

- Your egg must survive a fall from the ceiling. If your egg survives you will earn full credit for this portion of the project. (20 points)
- Bonus points are possible for a successful drop from an increased height. All containers that are successful at the ceiling drop will be brought to Rec Center. All eggs that survive this increased height will be awarded 5 bonus points.
- Additional points may be earned in the following categories:
  - Best Aesthetic Design (5 bonus points)
  - Most Spectacular Crash (5 bonus points)
- **As always the decision of the Judge (Mr. Moy) is FINAL.**

**Analysis** - Please write/type this on a separate sheet of paper.

- Using a pencil and ruler create a detailed schematic/diagram of your container on a piece of blank paper. Your diagram must be neat with all components labeled with size and material used. A minimum of two views of your container should be shown (side, aerial, interior, exterior). This diagram should be attached to your Project Sheet. (10 points)
- Describe any reasoning that led to your design (individual components or the overall design). (10 points)
- Comment on the success or failure of any particular piece of your design as well as the fate of your egg. (10 points)
- Using Newton's 1st Law explain why the egg continued through the container to the floor even after the container hit the floor. (10 points)
- Using Newton's 2nd Law explain how a decrease in the net force pulling the container to the ground would have an effect on the acceleration of the container as it fell. (10 points)
- How did the design of your container have an effect on the components of impulse on the egg while stopping/crashing into the ground? [Think about how impulse is related to the time a net force acts on an object] (10 points)
- Explain how some of your container designs may be used in the real world. (10 points)
- Given the chance, what modifications would you make to your design to improve it and why? (10 points)