

Honors Engineering Drawing

Problem Solving – Egg Drop

Problem: You are to design & prototype a box that will hold at minimum 2 large grade A eggs in their natural state. The box must be resealable and durable being able to withstand repeated drops from a specified height (7' – 7") using only the materials provided. The eggs must not fracture or crack in any of the attempted drops, this includes checking the eggs (removing from the device). The eggs will be held in the device and the eggs will be dropped together as one unit.

People: groups of two (2) and one group of three (3)

Materials/Equipment:

- Scissors
- X-acto knife, metal/plastic ruler for cutting
- 3 hot glue sticks 5/16 diameter for the final prototype
- Self healing mat for cutting, gluing etc.
- 15" x 20" sheet of cardboard – paper or corrugated for final prototype
- 6 rubber bands (provided)
- hot glue gun for gluing purposes only
- 10" x 10" X ½" piece of cushioning material in volume – **your choice of material**
- Drafting machines/stations for drawing the layout
- CAD
- Compass, pens, pencils

Time: 12-14 class periods (may be shortened or extended)

- 3 possible solution drawings due in 3 class periods
*** (each group member will hand in their own three (3) possible solutions)
- Build working models and testing - 3 class periods
- Analysis - record your results/observations of what happened for each drop – 1 class period
- 3 class periods to build your final solution prototype
- 1 class period to present and test your final prototypes
- 1 class period for presentation

Knowledge: Any from the previous projects.

Resources: Any except Mr. Mugno

Grading:

A. Prototype: 35%
5 drops - 10 points per egg per drop only if they do not fracture/fail
EX: Drop #1
Egg#1 – pass = 10pts
Egg#2 – pass = 10pts
Total Pts = 20pts
Drop#2
Egg#1 – pass = 10pts
Egg#2 – fail = 0pts
Total Pts = 30pts (Drop1 + Drop2)

If this occurs the top grade to earn would be a 60 D-

B. Possible solutions: 12%
- Three (3) sketches with detailed explanation of device and materials that will be used.
- Orthographic Projection drawing
- Any Perspective/3D
***Can be a CAD drawing or paper and pencil on graph paper*

C. Final Drawings (CAD): 15%
1. Layout - CAD 5%
2. Sectional Orthographic Projection CAD 5%
3. Perspective Drawing CAD 5%
(Isometric, Oblique, 1 or 2 pt. perspective)

D. Presentation: 10%

E. Documentation Questions: 30%