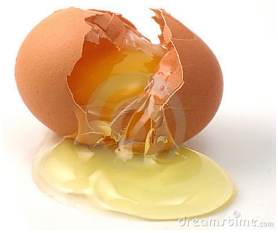
Operation Egg Drop



Mission Specifics

- **Objective:** Apply Newton's Laws along with the Principals of Conservation of Energy and Momentum to design a vessel that will carry and egg through a "free-fall" distance of 3 meters and land safely on the ground using *only a limited supply of materials.*
- **Who**: You individually or with a partner (students will be assessed individually)
- **When**: Starting today, Drop Date: _____
- **Where**: _____
- **How**: You will be given a budget and limited supply of materials with which to work. Only materials provided may be used. You will be given ONE egg for the testing and development of your structure.

Procedure

- Watch the introduction presentation and discuss variables that can be manipulated. Identify the laws of physics and the equations that predict how these variables are related to each other.
- Determine which variables you intend to manipulate. Refer to the list of building materials and design your vessel. Provide a sketch as well as a written explanation of how your design will change the variables in favor of the egg's survival. You may need to do some initial investigation or measuring to determine your strategy. You have unlimited used of common lab equipment: balances, spring scales, timers, tape measured, etc.
- Fill out the order list of supplies (make sure you do not exceed the budget) and submit your design and order form for teacher approval. You may not obtain materials or begin construction until you have approval.
- Build your design. You may run tests as you go but remember you will only get one egg to test and any materials damaged during construction are not replaced for "free"; replacement comes out of your budget.
- Test Day: You will have FIVE minutes to secure your egg in it's protective vessel. The class will assemble at the designated location. You should be prepared to "launch" your egg as soon as your name is called.

Outcomes

- Identify where Newton's first, second, and third laws apply to the situation.
  - You will write a paragraph on drop day explaining how you see these laws working in your device.
- 2nd Law: See how mass and acceleration can help identify how much force with which the egg hits the floor

FINAL REPORT

After all of the eggs have been dropped, you will be given a sheet to fill out as your final report. You will do this INDIVIDUALLY (even if you worked with a partner). You will be allowed to use any design notes or calculations that you wrote down in your notebook. Your final report will be completed in class.

See attached rubric for scoring details.