Bottle Rocket Design Unit

<u>Problem</u>: To use a 2 liter bottle and create a water rocket that will fly the highest.

Rules

1. A standard 2 liter plastic bottle must be used as the basic rocket.
2. The bottle may not be altered in any way. You may only add things to the bottle. Taking the label off is okay.
3. Nothing may be done to the bottle or added to the bottle that will add stored energy to the system. This means that you may not add things like engines, rubber bands, baking soda & vinegar etc. that will help the rocket to go higher. Nobody may touch or support the bottle once it is launched.
4. Northing may be added to the bottle that will interfere with launch of the bottle. (Make sure to test your design so it will not interfere with the launch of your bottle)
5. The pressure of all launches will be the same. (40 lbs. of pressure (psi) measured by the teacher)
6. The judging will be based upon the maximum height it achieves in meters.

Students will produce 2 reports.

<u>Report #1</u>

: Including the following.

1. Describe the problem to be tested.
2. A drawing of your first rocket with labels, measurements, and explanations.
3. Explanation of variable to be tested.
4. Description of our testing method.

<u>Report #2</u>

:Including the following.

1. A drawing of your final rocket with labels, measurements, and explanations.
2. Launch data for final rocket.
3. Triangulation data for final rocket.
4. Conclusion discussing:
    a. How does each of Newton's Laws apply to Bottle Rockets.
    b. How does mass affect the flight of your rocket.
    c. How would you improve your rocket if we were to build again.