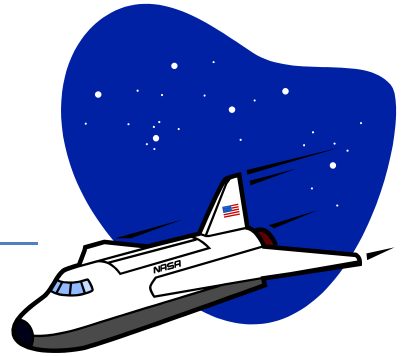


# Project 4: Bottle Rocket

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**Objective:** Design and construct a bottle rocket that will remain aloft for a minimum of 4 seconds. This is an individual project. Project must be the original work of the student; questions may be asked for verification.

**Team:** 2 members

**References:** Download Rocket Design Info PDF

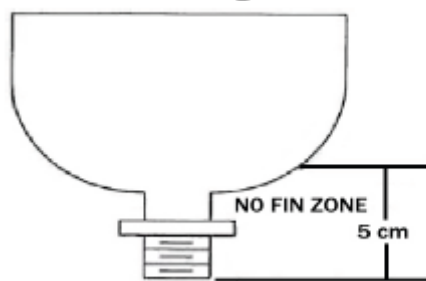
## Materials:

- 2 liter plastic carbonated beverage bottle (neck internal diameter of 2.2 cm). **LEAVE THE LABEL ON THE BOTTLE, NO LABEL = NO TESTING.**
- You may use any component materials (Nose, fins, etc.) but metal and commercial rocket parts are **prohibited**.

## Design Parameters:

1. All rockets **must** be launched using the launcher provided by the supervisor. Fins and other parts added to the bottle must be 5 cm (approximately 2 in) or higher above the level of the bottle's opening, to ensure rockets fit on the launcher (see Figure 2).

**Figure 2**



2. Rockets must not change shape or deploy any type of recovery system.
3. All energy imparted to the rocket at launch must originate from the water/air pressure combination. (No electronic devices, explosive chemicals, etc.)
4. No parts of the rocket fall off during flight.

**Testing Parameters:**

1. Safety glasses **must** be worn at all times.
2. **Never** stand over the rocket.
3. Timing begin when rocket separates from launcher and stops when any part of the rocket touches the ground, goes out of site or comes to rest on an obstruction.
4. Rockets with construction or safety violations will **not** be launched due to safety.
5. Rockets will be launched at 60 psi, 70 psi, and 80 psi. Once pressurized, nobody is to touch or approach the rocket.
6. When called to launch, each student has a total of 2 minutes to launch the rocket.

Student Name: \_\_\_\_\_

	Height (meters)	Time (seconds)
Run 1 (60 psi)		
Run 2 (70 psi)		
Run 3 (80 psi)		
Average Height (meters)		
Total Time (Run1+Run2+Run3)		
Average Time (Total Time/3)		

## Grading Rubric:

Section	Requirement	Points Possible	Points Earned
Technical Report	A. Entire Report must be <b>TYPED</b> in 12-Point Font, Double Spaced excluding section F.	5 Points	
	B. Report Cover	5 points	
	C. Cover Page	5 Points	
	D. Table of Contents	5 Points	
	E. Research	20 Points	
	F. Rocket design with Metric Dimensions (Dimensions in mm or cm)	20 Points	
	G. Observations and Conclusions	10 Points	
Rocket	H. Rocket meets constraints and material restrictions	20 Points	
	I. Rocket remains aloft for 4 seconds	10 Points	
	J. Bonus – Rocket with the maximum flight time	10 Points	
	K. Bonus – Rocket voted most popular by design and decoration	10 Points	
Total Points	Maximum points without Bonus	100	