

# LAB 5: Overthrowing Gravity w/ Air Rockets

Date:

Group:

Purpose: To demonstrate how forces affect a rocket's flight, calculate flight data, & understand Newton's laws of motion

(Notes from Drusky)

## Hypothesis

\* Must be pre-written by launch day

Data

1) My Rocket

1 mL H<sub>2</sub>O =  
1g H<sub>2</sub>O

Name of Rocket	Mass of Rocket (kg)	Volume H <sub>2</sub> O (mL)	Mass of H <sub>2</sub> O (kg)	Volume Air (mL)	Relative Pressure (# of Pumps)	Hang Time (sec)	Time of Fall Down (sec)	Displacement (Δx) (m)	Final Velocity (m/s)	Average Velocity (m/s)
			*						*	*

Altitude (d <sub>y</sub> ) (m)	Force @ Launch (N)
*	*

## Calculations (\*) (Show work)

$$\text{Mass of H}_2\text{O} = \# \text{ mL} \times 1 \text{ gram} = \underline{\hspace{2cm}} \text{ g} \times \frac{1 \text{ kg}}{1000 \text{ g}} = \underline{\hspace{2cm}} \text{ kg}$$

$$\text{Average Velocity} = \frac{\text{Total Distance}_y}{\text{Total Time}_y} = \underline{\hspace{2cm}} \text{ m/s}$$

$$\text{Final Velocity} = V_f^2 = V_i^2 + 2gd_y$$

$$\text{Altitude} = d_y = \frac{1}{2}gt^2$$

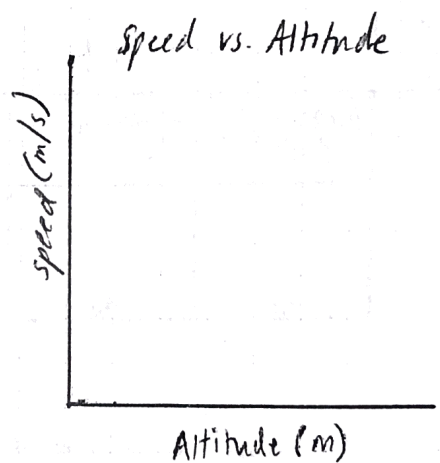
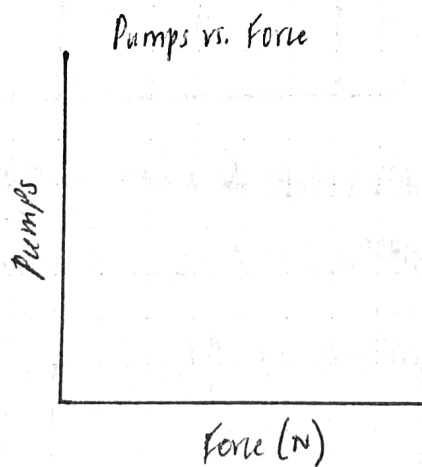
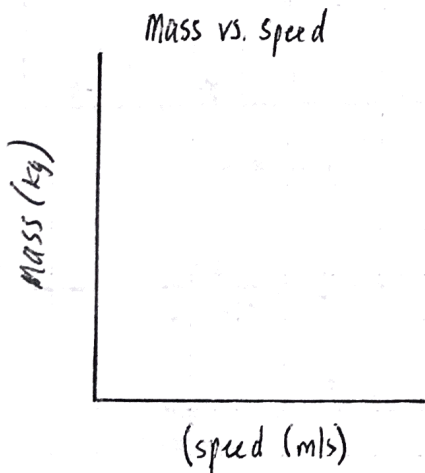
$$\text{Force at Launch} = F = ma$$

② Class Rocket Data  
(kg)

Rocket #	Mass (Rocket + H <sub>2</sub> O)	# of Pumps	Hang Time	Displacement	Avg Speed	Top Speed	Altitude	Force (N)

③ Detailed Schematic Sketch of Rocket (w/ measurements)

Analysis → Make 3 graphs of the class data (pick the variables)



Conclusion →