

ICP: Analysis for Balloon jet Lab**Name:** _____

Refer to the lab on page 383 of your texts.

RESULTS TABLE:

Length of Balloon: _____ cm

Mass of balloon: _____ g

Mass of Nuts: _____ g

Mass of straw: _____ g

Number of nuts used	Trial Number	Total mass of system	Time (s)	Distance (cm)	Average Speed	Acceleration
0	1					
0	2					
1	3					
1	4					
2	5					
2	6					
3	7					
3	8					
4	9					
4	10					

ANALYSIS:

- 1) Showing all work, calculate the average speed for all trials and put your results in the chart.
- 2) Showing all work, calculate the acceleration using one of your kinematics formulae

Newton's First Law

- 3) Why does the balloon not move until the end is released?

Newton's Second Law

- 4) Complete the chart for your six trials

Trial	Mass	mass x acc (F)	1/m
1,2			
3,4			
4,5			
7,8			
9,10			

5) Mathematically, mass multiplied by acceleration is equal to the force applied to move an object. Using all of your data points from above, plot the following graphs:

- a) force on the y axis and mass on the x axis
- b) force on the y axis and acceleration on the x axis
- b) acceleration on the y axis and $1/m$ (reciprocal of mass) on the x axis

6) Doing your work on the graph calculate the slopes under these graphs. Show your calculations. Look carefully at the units, what do these slopes mean?

- a) slope in graph #1 means →
- b) slope in graph #2 means →
- c) slope in graph #3 means →

7) What is the relationship between force and mass? Force and Acceleration? Acceleration and mass?

Newton's Third Law

8) In what direction was the air moving when it leaves the balloon?

9) In what direction is the force of the air going when it leaves the balloon (away from the balloon or towards it)?

10) In what direction does the balloon move?

11) Summarize the relationship between the direction of applied forces.