

NAME:

Which 9 weeks? 1 2 3 4

Design and test flight #7 of Paper Airplanes /40



<https://www.grc.nasa.gov/WWW/K-12/aeroact.htm>

<https://www.grc.nasa.gov/WWW/K-12/TRC/Aeronautics/AeronauticActivitiesHome2.htm>

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Enrichment Science Lab Report

KEY TERMS/ QUESTIONS	NOTES
TITLE	Design and test flight of Paper Airplanes
Introduction:	In this lab you will need to use the scientific method to design, build, test, and redesign paper airplane.
Problem: (you complete)	<i>Minimum passing flight is one plane MUST clear 8.0 meters once</i>
Hypothesis: (you complete)	
Materials:	Paper, stop match, ruler
Procedures:	See Lab sheet for directions (Minimum Flight distance: 8 meters) YOU need to show ALL work for the Calculations
Data:	<p>- 1 centimeter = 0.3937 inch 1 meter = 3.28 feet</p> <p>- Bernoulli's Constant is $P = \text{air pressure} = 14.7$</p> <p>- gravity $(g) = 9.8 \text{ meters/second}$; Height of Flight = 5.94 meters</p> <p>WHICH PLANE DID YOU USE?</p> <p>- Mass of plane = _____ grams</p> <p>- $p = \text{density} = \frac{\text{mass}}{\text{volume}} = \frac{\text{(see above)}}{58.17 \text{ cm}^3}$</p> <p>- $v_{\text{final}} = \text{final Velocity} = \frac{\text{distance(meters)}}{\text{time(seconds)}}$</p> <p>- Convert v_f to miles per hour: $(v_f \times 2.23 = \text{mph})$</p> <p>- Bernoulli's Constant = $P + \frac{1}{2} \rho v^2 + pgh$</p>
Graph:	See Back of THIS lab report.

+2

+4

Conclusion:
SUMMARY

+10

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YOU must include the formula and the numbers. Units are not needed for THIS problem only

WHICH PLANE color was the BEST? _____

Mass of plane = _____ grams

Longest distance flew = _____ meters

Time for longest flight = _____ seconds

**complete the following calculation about you plane.

UNIT must be included to receive credit **

$$p = \text{density} = \frac{\text{mass}}{\text{volume}} = \frac{\quad}{58.17\text{cm}^3} =$$

$$v_f \text{ final Velocity} = \frac{\text{distance(meters)}}{\text{time(seconds)}} \{ \text{insert numbers below} \}$$

$$V_{\text{final}} = \text{-----} = \underline{\hspace{2cm}}$$

Convert v_f to miles per hour : ($v_f \times 2.23 = \text{mph}$)

$$(\underline{\hspace{2cm}})(2.23) = \underline{\hspace{2cm}}$$

$$\text{Bernoulli's Constant} = P + \frac{1}{2} \rho v^2 + \rho gh$$

Bernoulli's Constant is = _____

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Minimum passing flight is one plane MUST clear 8.0meters once

You MUST Highlight your BEST longest flight

What design was different	Flight #	Distance Traveled (meters)	Time of Flight (seconds)	Observations	Velocity (Distance ÷ Time)	Velocity (mph) (V _f x 2.23)
Standard model	1.					
	2.					
	3.					
	4.					
	5.					
	6.					
	7.					
	8.					
	9.					
	10.					
	11.					
	12.					
	13.					
	14.					
	15.					
	16.					
	17.					
	18.					

+13

+6

+3

+21 total

MASS (in grams) of BEST plane: VOLUME (in cm³) of BEST plane: 58.17cm³ Bernoulli's Constant= $P + \frac{1}{2}\rho v^2 + \rho gh$

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Minimum passing flight is one plane MUST clear 8.0 meters once

You MUST Highlight your BEST longest flight

What design was different	Flight #	Distance Traveled (meters)	Time of Flight (seconds)	Observations	Velocity (Distance ÷ Time)	Velocity (mph) (V _f x 2.23)
Standard model	19.					
	20.					
	21.					
	22.					
	23.					
	24.					
	25.					
	26.					
	27.					
	28.					
	29.					
	30.					
	31.					
	32.					
	33.					
	34.					
	35.					
	36.					

+13

+6

+3

+21 total

MASS (in grams) of BEST plane: VOLUME (in cm³) of BEST plane: 58.17cm³ Bernoulli's Constant= $P + \frac{1}{2}\rho v^2 + \rho gh$