

This is Rocket Science Lab Report

Directions:

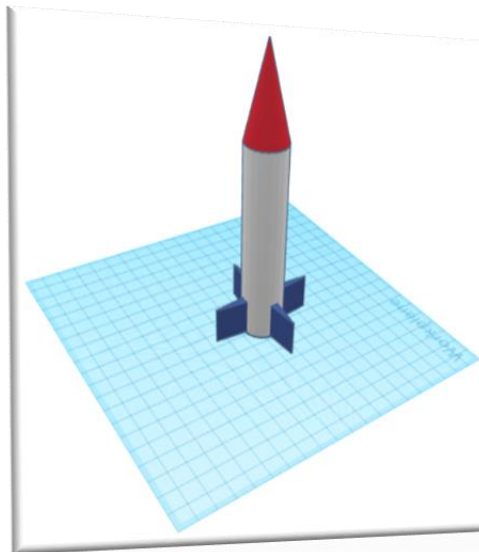
1. **Create** at least 2 rockets and a maximum of 4 rockets.
 2. **Research and design** (R&D) any improvements and changes based upon your first rocket's performance (you want to better your max high vs. your 1st rocket).
 3. **Construct** your new rockets (name and number each rocket).
 4. **Test** your new designs and collect data.
 5. Enter your [design info](#) and [cost data](#) in the Google Sheet (see [weekly homework](#) for the links).
 6. Measure, record and enter flight data (TIME to APEX, TOTAL FLIGHT TIME and DISTANCE*)
 7. **Draw a scale model** of your best design.
 8. Do the **calculations** listed below.
 9. **Answer** the **post project questions**.
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Final Design Drawing:

Include a detailed drawing of your **final** design. (use the FULL PAGE for the drawing).

You need to include the following drawings:

- a. A **neat, accurate drawing** of your rocket.
- b. Use a **ruler** for making straight lines.
- c. **Measurements** (in cm) for the **length (height)** and **width** or **all the parts** of your rocket.
- d. In **FULL COLOR**
- e. Include the **FORCES** acting on your rocket and their **direction** (use **arrows**).



(Turn this CLASS COPY over... You're Welcome)

Data:

1. **Record** ([Google Sheet](#)) the following **before launch**:
 - a. Fuselage length (length of the rocket body)
 - b. Nose cone length
 - c. Number of fins
 - d. Shape of fins
 - e. Mass of rocket
2. **Record** the following **after launching** for each rocket:
 - a. **Time** (in seconds) to the **apex** (highest point)
 - b. **Total time** from launch to hitting the ground

Calculations:

You will do the calculations for each of your rocket designs (3 rockets total). Make sure you **show your work**. In your notebook include the following calculations:

1. **Calculate** the approximate **HEIGHT** reached by your rocket using this formula: $d=1/2at^2$
 - a. d = **distance** traveled (to highest point or **apex**)
 - b. a = **acceleration** due to gravity, (9.8 m/s^2)
 - c. t = the amount of **time** it took for your rocket to reach the apex
2. **Calculate** the **AVERAGE VELOCITY** reached by your rocket using this formula: $v= d/t$
 - a. d = **distance** traveled (from the equation above)
 - b. t = the amount of **time** it took for your rocket to reach the apex
3. **Calculate** the **AVERAGE MOMENTUM** reached by your rocket using this formula: $p= mv$
 - a. p = momentum (quantity of motion that your rocket has)
 - b. m = mass in (kg not grams)
 - c. v = average velocity from #4 above

Post Project Questions: (Answer in complete sentences)

1. Explain your rocket using each of Newton's 3 Laws of Motion. (All 3 laws should be addressed.)
2. What did you change from the original design? Why?
3. Which rocket worked better (in terms of height of launch), your original design or your 2nd, 3rd or 4th design? Why? **Use data to support your claim.**
4. What forces influenced your rocket? Explain at least three.
5. What is something you learned from this lab that you can apply to your personal life?