

QUARTER PHYSICS PROJECT

1st Quarter Project = Rocket

INTRODUCTION

Each student will need to research, design, and construct a rocket using an empty 2-liter bottle. The data collected from the launching of the rocket will then be used along with the formulas from class for 1st quarter to calculate the vertical height the rocket climbs to as well as the initial launch velocity. There will be 3 phases of the project, each worth 100 points.

MATERIALS NEEDED

Empty 2-Liter Bottle
Paint
Decorations

PART I = RESEARCH & DESIGN PHASE

In this phase, each person will research various bottle rockets, choose their design, and determine the materials needed for their rocket. They will also need to answer all of the questions on the Research & Design Worksheet.

Research & Design Report Due on _____

PART II = LAUNCH DAY

In this phase, each student must have their rocket completely built and ready to operate by the due date. The launch pad, launcher, and stopwatch will be provided by the teacher. How well the rocket is built, its appearance, and how well it flies will be graded.

Launch Day (Rockets Due) on _____

PART III = CONSTRUCTION & LAUNCH WORKSHEET

In this phase, each person will analyze their construction process, the effectiveness of their rocket, and calculate the height their rocket climbed to and its initial launch velocity on the Construction & Launch Report Worksheet, then type a report summarizing the project.

Construction & Launch Worksheet Due on _____

**REMEMBER THAT NO PART OF QUARTER
PROJECTS CAN BE TURNED IN LATE!!!**

Make sure that you and/or your partner turn in the research phase before the due date!
Make sure that you and/or your partner bring the car to class on the due date!

Physics Project

1st Quarter = Rocket

Name: _____

Period: _____ Date: _____

Research & Design Worksheet

Use this worksheet to help gather the information needed to type your research and design part of the project

RESEARCH

Use the internet to research rockets and rockets made from plastic 2-liter bottles. If you are going to use any information from a website to help you decide how to build your rocket, what to build it with, or even just information about what various parts of the rocket help it with, document the websites below. Be sure to use APA or MLA format when you are citing them in your final report. You will have to reference them correctly in your report as well. Write the websites down so you can go back to them as you continue to work on your project:

DESIGN

You are going to need a list of materials you intend to use for your rocket. The body, fins, nosecone, weighing materials, and how you will attach everything together will need to be decided. Start making a list of all the materials here as well as why you are going to use this specific material (why this one instead of another possibility?):

Physics Project

1st Quarter = Rocket

Name: _____

Period: _____ Date: _____

Are you going to add any special features to your rocket that would not be considered a “basic” or “normal” design? If so, explain what they are and why you are adding them:

Once you know what you plan to do for your rocket, you are going to need to put together a step-by-step list of instructions on how to build your rocket. Don't try to do all of these before you build it. You may start building your rocket and run into an issue where you will have to add/remove or switch the sequence of steps as you try to build the rocket. Use this space to jot down notes on what you do so you can type the steps in the correct sequence for your report. You will want the steps to be short, clear, and well-written. Anyone who reads them should be able to reconstruct your exact rocket using them.

All construction projects require a diagram of the object being built. On a separate piece of paper, sketch a complete diagram of your rocket and be sure to label each part just as you would see on the instructions on how to put together something from IKEA or with any toy that requires you to put it together. For the report, it would be better if you were able to draw the diagram on the computer and label it, but a hand-drawn diagram is acceptable if it is well-drawn and easy to see and read.

BE SURE THAT YOU TYPE YOUR REPORT WHICH MUST INCLUDE ALL OF THE INFORMATION FROM THIS WORKSHEET AND USE THE RUBRIC FROM THE WEBSITE TO MAKE SURE THAT EVERYTHING YOU NEED TO EARN YOUR POINTS IS IN YOUR REPORT.

R & D WORKSHEET DUE _____

Physics Project

1st Quarter = Rocket

Name: _____

Period: _____ Date: _____

CALCULATION OF LAUNCH VELOCITY AND HEIGHT

Assume that your time from the launch was the time it took for your rocket to go straight up and down. Then calculate the following values for your rocket using your knowledge of Newton's Laws.

3) What the launch velocity of your rocket? Be sure to show the formula you used to determine your answer.

4) What was the approximate height that your rocket reached? Be sure to show the formula you used to determine your answer and explain why you had to modify your time to determine the height.

BE SURE TO COMPLETE THIS WORKSHEET AS THOROUGHLY AS YOU CAN, SHOW ALL OF YOUR CALCULATIONS, AND THEN TYPE YOUR REPORT BY THE DUE DATE.

C & L REPORT DUE _____