

Hit the Cup Project Report

The hit the cup project will bring together all of the concepts that we have been learning during the first six weeks. You may remember that abstraction of a concrete event requires language, diagrams, graphs, and algebra/ mathematics. This report will require all of those abstractions to describe your knowledge of kinematics that you used to land a toy car in a moving cup.

It is my intention to make your reports available to Mr. Young and members of the school board. I may even publish some of your reports online (without your names). Please take them seriously because real people will be reading them and the contents of the reports are a reflection on you.

This report will count as a test grade. Use the following outline to guide you in preparing your report. A rubric is also available.

Just for your reference, I would expect this report to be 3-5 pages in length. One page is for the diagram. It will probably take $\frac{1}{2}$ - 1 page for the results and calculations if you organize them neatly (You can use the equation editor in word to make calculations look nice). The video analysis image will take $\frac{1}{2}$ page; the discussion will require some room.

A rough draft of sections I-IV will be due on Thursday. I simply want to see evidence of work those areas. The rough draft will count as a literacy grade; have some actual work done and it's an easy 100.

I. Title

The title must state clearly the *aim* of the project. It must tell the reader what you are trying to prove or measure.

II. Introduction

The introduction for the report should state the overall purpose for the research activity. In the Hit the Cup activity explain to the reader what you plan to demonstrate. (Don't just say, "I'm planning on landing a Hot Wheel in a cup...") This unit is about Kinematics; what does this activity demonstrate about kinematics? What is Kinematics?

III. Hypothesis

Before starting your investigation, you usually have some idea of what you expect the results will show. The hypothesis is basically a statement of what you are expecting. (Make a prediction)

IV. Method/ Procedure

The method section should give enough detail to enable another experimenter to repeat the experiment to see if he/she agrees with your results/conclusions. The method should include

- a description of the apparatus used (You may refer to the diagram)
- what measurements you made (if possible, in the order you made them)
- what precautions you took to ensure the best accuracy possible
- a mention of any unexpected difficulties (and how you overcame them)

V. Diagram

Create a clearly labelled diagram of the ramp and landing area. This needs to include the physics structures as well as the flight path of the projectile. Dimensional measurements need to be clearly shown.

This diagram needs to be drawn using a ruler and be done as neatly and precisely as possible. A pencil drawing on copy paper is preferred – it can be included in the final printed report.

VI. Results/ Calculations

You should record *all* the measurements made during the experiment.

Include all of your calculations. Make sure each calculation begins with a formula, then has numbers with units, followed by an answer with units. Include a sentence that identifies the purpose of each calculation if necessary.

VII. Conclusion/ Evaluation

Every experiment report must have a conclusion.

A. Video Analysis

Capture a video of your attempt to land your car in the cup and analyze the video as we did in class. Include a screen capture of the video analysis in your paper. This is a great way to compare and evaluate your results and mathematical predictions. Include an explanation of the video analysis.

B. Write your evaluation of the project.

Did you demonstrate what you wanted? Were there unexpected problems? What would you do differently if you repeated the investigation? What were your sources of error? Were those errors human, mechanical, or other?