Projectile Motion

Buena Vista High School
Buena, Arizona

Up until now, you have been studying linear motion. what other types of motion do you observe in the REAL world? Just as an example, pick up an object and toss it to one of your dassmates. How would you describe that type of motion? Is it linear? Is it constant speed or accelerated? By now, you are probably wondering what this is all about. This is your next assignment.

Problem

You will design and construct a repeatable and quantifiable demonstration of projectile motion using lowost materials. Using the Thayer Method, you will select and design a device. You will have approximately three dass periods to design and execute the experiment and to gather the initial data which you will analyze. At the end of the unit, you will hand in a written report

Assessment

You will be assessed on your written report and your group presentation by your teacher/review board.

Written Report

Utilization of Thayer Method
- Define the Problem
- Generate Specifications
- Generative Alternative Solutions
- Test Viability via Matrix
- Selected Best Approach

Execution of Best Approach/Experimental Procedure
- Viable Projectile Motion
- Made Appropriate Measurements
- Record of Data

Data Analysis
- Generated a Graph
- Describe a Curve Mathematically

General Conclusions
- Describe Projectile Motion
- Discuss Error
- Suggestions

Budget Report

Group Presentation

Demonstrate device
Illustrate your use of the Thayer Method including one matrix analysis
Mathematical analysis
Conclusions
Assessment

Design Report

I. Introduction: (15 pts)
- Title Page (4pts)
- Problem Statement (3 pts)
- Problem Redefined (3 pts)
- Constraints and Specifications listed and defined (5 pts)

II. Alternatives (15 pts)
- Several alternative solutions discussed (5pts)
- Matrix Analysis illustrated/discussed (10 pts)

Ill. Final Solution (15 pts)
- Clear reason for final choice given (5 pts)
- Final solution described (5 pts)
- Clear illustrations used (5 pts)
- Description of Cost or Prototype and Cost to Market (3 pts)

IV. Miscellaneous (5 pts)
- On time with paper trail (deduction only)
- Neatness of report (5 pts)

V. Self evaluation: (15 pts)
- Students worked together in the group (5 pts)
- Everyone did fair share (5 pts)
- Solution was the optimal one (5 pts)

TOTAL (65 pts)

Student Group Evaluation Form

Narnes of Students in the group—rate them on a sca!e of 0 to 5 (5=highest) for their effort in making your project a success.

1. _____
2. _____
3. _____
4. _____

If someone scored 3 or less, please explain what you perceive as the problem and why you scored them as you did (on the back of the paper).

1. Did your group function effectively?

2. Did your group work together to share responsibilities equitably?

3. Did your group maintain neat and accurate reports of each piase of your project?

4. Did your group meet all deadlines?

5. Did your group develop logical matrices to assist in redefinition of the problem and to generate ideas for the final product?

6. Did you feel that you did all or most of the work?

7. Did you try to involve all members of the group?

8. What were your specific responsibilities in the group and did you do them?

9. Did your project meet the ongmal problem statement.

10. Overall rating of your Project

Oral Presentation

_____ Group Number/Name
_____
_____ Project
_____

Presentation of Project Results:

1. Clear Statement of Problem 5 pts _____

2.Clear Statement of Constraints 5pts_____

3. Clear Reason Given for Choice of Solution (Matrix) 10 pts ___

4. Clear Description of Device (Verbally and Visually) 10 pts ___

5. Excellent Use of Visual Aids/Props for 1–4 above 10 pts _____

6. Spoke with clarity 5 pts_____

7. All Members of the Group Participated 5 pts _____

8. Answered Questions Clearly and with Intelligence 5 pts _____

TOTAL (55 points max) _____