



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title
The Precision of Paintball When Shot, Depending on the Brand of Material Characteristics

Abstract

Objectives/Goals
To determine manufacturing factors such as material characteristic of paintball, design of barrels and design of air tanks on whether the paintball will hit or miss. We will measure how the external environments affect the flight of the ball.

Methods/Materials
Manipulated Variables: Material characteristic (brand), design of barrel, design of marker, and design of tank
Responding Variable: Deviation from target
Control: speed of paintballs, height of barrel from floor, size of target board, distance between target board and barrel of markers
Step 1: Paintballs were put into separate bags and subjected to different temperatures: 37.79°C, 23.35°C, and 0°C. Step 2: Target board was put up on wall. Step 3: Markers were set up. Step 4: After 1 hour, paintballs were taken out and for each marker and tank, there were 5 trials.
To ensure barrel was level, a leveling tool was used. To make sure barrel was aimed at bulls eye, a string was stretched between tip of barrel and bulls eye. All five shots were fired, then measured, then wiped off.

Results
Of the Giant paint (with solid, filled level, rigid structure), fired with the Smartparts Ion and LPA tank at normal temp batch, it had the lowest mean out of all brands of paint and markers and tanks
Mean of 4.02cm, avg dev of 1.35, and %dev of 33.55%.
Of the White Box (with solid, filled level, rigid structure), fired with the Smartparts Ion and LPA tank at normal temp batch, it had the second lowest mean
Mean of 5.34cm, avg dev of 1.97, and %dev of 36.97%
Of the Giant (with solid, filled level, rigid structure), fired with the Alpha Black and CO2 at normal temp batch, it had the highest mean
Mean of 44.26cm, avg dev of 1.38, and %dev of 3.11%

Conclusions/Discussion
The study somewhat supported hypothesis, although the overwhelming data was all over the place
The Giant paint hit bulls eye twice
Other shots were close
White box paint hit bulls eye once

Summary Statement
The precision of paintball when shot, depending on the brand of materials characteristic (external environment)

Help Received