

Islip Invitational 2013 Experimental Design

Balls have been toys practically forever, but the bouncing ball is a more recent innovation. Bouncing balls were originally made of natural rubber, though now bouncing balls can be made of plastics and other polymers. Polymers are molecules made up of repeating chemical units. Glue contains the polymer polyvinyl acetate, which will form cross-links to polymers when reacted with additional materials, such as borax and corn starch.

You have been given the following materials by the Islip Toy Company to determine which combination of materials will develop the most effective bouncing ball.

- 2 spoons
- 2 small cups
- 1 large cup
- A container of Borax (sodium borate)
- A container of Corn starch
- Water (from the faucet)
- A container of Glue
- A thermometer
- A ruler or similar measuring device

Your report to the Islip Toy Company must include the components listed below. Be sure to **clearly** indicate the different required sections of your report (**5 point deduction**).

1. Statement of Problem (4 points)
2. Hypothesis (8 points)
3. Assignment of Variables (20 points)
4. Experimental Control, if appropriate (4 points)
5. Materials (6 points)
6. Procedure, including any relevant diagrams (12 points)
7. Qualitative Data (8 points)
8. Quantitative Data (12 points)
9. Graphs (12 points)
10. Statistics (4 points)
11. Analysis of Results (8 points)
12. Possible Experimental Errors (6 points)
13. Conclusion (8 points)
14. Applications and Recommendations for Further Use (8 points)

Ties will be broken by comparing the total points in (1) procedure, (2) data table(s), and (3) analysis of experimental error, in that order. You must clean up all supplies, as instructed by the event supervisor, or the team will be assigned a **10% penalty** to the total points of the event. If additional paper is needed for your report, please alert the event supervisor.