Experimental Design – Division C

2012 Twin Tiers Science Olympiad Invitational

Instructions:
Design, conduct, and report the findings of an experiment that incorporates one of **Newton's Laws of Motion** using the materials provided. You will have 50 minutes.

Provided Materials:
-Two 1 foot 1x2s
-Three ½ inch Hex Nuts (mass of one nut = 16 grams)
-Six ¼ inch Hex Nuts (mass of one nut = 2 grams)
-Four Screw Eyes
-Ten Feet of Rope
-Six Paper Cups
-Three Feet of Duct Tape
-Scissors

Student Provided Materials:
-Timepiece
-Ruler
-Non-Programmable Calculator

Newton's First Law states that every object in a state of uniform motion tends to remain in the state of motion unless an external force is applied to it.

Newton's Second Law states the relationship between an object's mass m, its acceleration a, and the applied force F is F = ma

Newton's Third Law states that for every action, there is an equal and opposite reaction.

Frequently Asked Questions:
-you **must** wear goggles at all times
-you **are** allowed to rip the sheets apart, please staple together at the end
-you **may** modify your materials
-you **may** have extra paper for the write up or continue onto the backs of the provided outline, please clearly designate which section you are continuing

Clean Up:
-please discard any modified materials; leave **unmodified materials at the station**
-ensure high school and team number is written on every page
-staple report in proper order **with this sheet as the cover page** then turn into event supervisor

High School: _____
Team #: _____
Team Name: _____

Station Number: _____

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Best of Luck.

High School: _____
Team Number: _____

1. **Statement of Problem**

2. **Hypothesis**

3. **Variables**

Independent Variables

Dependent Variables

Controlled Variables

4. **Experimental Control:**

5. Materials

6. Procedure

7. Qualitative Observations

8. Quantitative Observations

9. Graph(s)

10. Statistics

11. Analysis and interpretation of Data

12. Possible Experimental Error

13. Conclusion

14. Applications and Recommendations for Further Use