Experiment Design

Presenter: Nicholas Ciambrone
Email: nickciambrone@pibso.org
NCSO Resources: https://www.sciencenc.com/resources/middle-school/experimental-design/

Description:
This event is run however the event supervisor deems necessary for the task(s) they have prepared. Teams may be give a full experiment or any combination of written test or stations. Teams will be presented with a semi-guided task or questions at each station.

Materials:
Splash goggles, something to write with

Scoring:
High score wins. Points are earned for the quality and accuracy of responses. Ties will be broken with preselected questions.

Coaching Tips:
- Students need to think quickly and be focused on the task for the entire time period.
- Any slacking off during the competition will result in not completing the experiment on time.
- Teams should be a combination of older and younger students.
- Students should review a variety of science topics (experiments could be anything).
    - Typically they involve physics and basic chemistry.
    - Physics topics: Newton's Laws, Simple Machines, Speed, Energy Transfer
    - Chemistry topics: Acid-Base Reactions, Endothermic/Exothermic Reactions
    - This is only a small selection of possibilities.
- Students should split who completes which experimental components to maximize time.
    - Make this plan ahead of time and find who is strongest in which part.
    - Put your "aces in their places".
- Common strategy:
    - First 5 minutes, discuss experiment, write hypothesis.
    - 5-20 minutes, write all part 1 steps and begin running the experiment. Make sure variables and procedure are correct. They are worth a lot of points!
    - 20-30 minutes, data collection/ calculations. Make sure calculations the graphs are accurate!

- 30-50 minutes: Analysis, Conclusions, Errors and Applications (spend the time to make sure these are detailed, points can easily be lost here. The more detailed the better).