Experimental Design Test
12/2/17
Raisbeck Aviation High School

Names: ________________________________

School: ______________________________

Team Number: __________________________

Background:

The Boeing company has been commissioned to design a new glider for the United States Air Force special forces. Boeing has hired your aerospace consulting company to design a handheld prototype.

Task:

Your team is to design and conduct an experiment that explores different ways of constructing a paper glider and launcher to find the best way to make a paper glider flight last the longest and hit a target. You have 50 minutes to conduct, write up and clean up your experiment station.

Materials:

- Paper Clips
- Scissors
- Calculators
- Rubber Bands
- Extra Paper
- Graph Paper
- Meter Stick

- Glue Sticks
- Tape
- 3 sheets white printer paper
- 3 sheets notebook paper
- Stopwatch
- Ruler
- Label Tape for target

Directions:

Please use the notebook paper to write up your experimental design. Using the notebook paper in your experiment will lead to a point deduction. Please only use the label tape for making a target. Grading will be done using the attached rubric.

Do your best to not interfere with other teams in their design and operation. Interference with another team deemed inappropriate will lead to a warning. Another further interference will lead to up to a 4 point deduction and could lead to disqualification.

Good Luck!
2017 Experimental Design Checklist for B/C (rev. 10/4/15)  
(Note: all tasks listed under each section are worth a maximum of 2 points unless otherwise stated)

A. Statement of problem (4 Points)
____ Not a yes/no question and includes independent and dependent variables
____ Problem is clearly testable and is written in a clear and concise manner

B. Hypothesis (8 points)
____ Statement predicts a relationship or trend
____ Statement gives specific direction to the predictions(s): A stand is taken.
____ Prediction includes both independent and dependent variables
____ A rationale is given for the hypothesis.

C. Variables

Independent Variable (IV) (6 Points)
____ IV correctly identified
____ IV operationally defined
____ At least three levels of IV given

Dependent Variable (DV) (6 points)
____ DV correctly identified
____ DV operationally defined

Controlled Variables (CV) (8 points)
____ One CV correctly identified
____ Two CVs correctly identified
____ Three CVs correctly identified
____ Four CVs correctly identified

D. Experimental Control (Standard of Comparison-SOC) (4 points)
____ SOC correctly identified and makes logical sense for the experiment
____ Reason given for selection of SOC

E. Materials (6 points)
____ All materials used are listed
____ All materials used are listed properly (no extras)
____ Materials listed separately from procedure

F. Procedure: Including Diagrams (12 points)
____ (2pts) Procedure well organized
____ (2pts) Procedure is in a logical sequence
____ (2pts) Diagrams used
____ (2pts) Repeated trials
____ (4pts) Enough information is given so another could repeat procedure

G. Qualitative Observations (8 points)
____ Observations about results given
____ Observations about procedure/deviations
____ Observations about results not directly relating to Dependent Variable or other data
____ Observations given throughout the course of the experiment

H. Quantitative Data - Data Table (12 points)
____ All raw data is given
____ All data has units
____ Condensed table containing most important data
____ Table(s) labeled properly
____ Example calculations are given
____ All data reported using correct figures (significant figures C Division only)

I. Graphs (10 points)
____ Appropriate type of graph used
____ Graph has title
____ Graph labeled properly (axes/series)
____ Units included
____ Appropriate scale used

J. Statistics Division B&C (6 points)
____ Such as: average (mean), median, mode, range, line of best-fit or other appropriate statistic used

K Analysis and interpretation of data (8 points)
____ All data discussed and interpreted
____ Unusual data points commented on
____ Trends in data explained and interpreted
____ Enough detail is given to understand data and all statements must be supported by the data.

L. Possible Experimental Errors (6 points)
____ Possible reasons for errors are given
____ Important info about data collection given
____ Effect errors had on data discussed

M. Conclusion (8 points)
____ Hypothesis is evaluated according to data
____ Hypothesis is re-stated
____ Reasons to accept/reject hypothesis given
____ All statements are supported by the data

N. Applications and Recommendations for Further Use (8 points)
____ Suggestions for improvement of specific experiment are given
____ Suggestion for other ways to look at hypothesis given
____ Suggestions for future experiments given
____ Practical application(s) of experiment given