Engineering Design Project

Research Plan Instructions: (**Attach to Form 1A**)

*A written outline of your project PLAN (NOTE- you cannot begin experimenting until this plan is approved)*

Heading: Name Title of Project Category

1. Identify Need for Item to be Made- Overview of the topic investigated
2. Design Criteria- specific statements of the factors to be considered and the features of the design that will fulfill the need(s) identified.
3. Research of Prior Developments- What structures / machines have been previously built to address the needs Identified above? What are the good and bad features of current or previous designs? Why are improvements needed for the structures / machines in use currently?
4. Preliminary Design -List features of project with specific explanation of each (may need illustrations/diagrams)
5. Materials-

List materials to be used In column format Give model name or number appropriately for tools

List equipment Use ® for any brand names used

Itemize consumables Do not number the list

Method-

1. Number the steps to be followed
2. Use 3rd Person, Passive Voice, Future Tense for text of Research Plan Method(“length will be measured”)
3. Be specific about every step.
4. Be sure that another scientist reading this would be able to exactly imitate your experiment, and therefore be able to support your findings.
5. Use illustrations or diagram(s) to fully identify models

Plans for Testing Prototype-

1. Identify how many trials will be run for testing each prototype .
2. Identify what is to be recorded (dependent variable) with the units to be used.
3. Indicate what criteria will be used in deciding to modify prototypes.

Data Collection from Testing Prototype-

 Prepare Data Collection Table:

SAMPLE:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Title: Measured Goal (units) |  |  |  |  |  |  |
|   | Trial #1 | Trial #2 | Trial #3 | Trial #4 | Trial #5 | Trial #6 | Form of Data Analysis (e.g. Average or Mode) |
| Prototype |   |   |   |   |   |   |   |
| Current Standard Tools |   |   |   |   |   |   |   |

Data Analysis-

 Describe what you will do to the data collected to arrive at a proper conclusion regarding need for modifications and effectiveness of model built.

For Quantitative data (values on a standard scale) such as “time (min)” or “temp (oC)” mathematical analysis such as averaging, squaring, totals, differences, or proportional equations can be performed.

For Qualitative data ( non-standard scales e.g.“Scale of Effectiveness (0-5)”) the mode can be used for analysis. Maximum values, minimum values, and ranges can be reported.

Actual or Projected Modifications- Describe improvements made or suggested by your testing of the prototype

1. Safety Concerns-

List potential safety hazards that may be faced in doing your project. Include any tools or potentially dangerous activities. Explain what adult supervision will be provided during building and testing of models/ prototypes.

1. Bibliography-

Use proper MLA format. Do not number entries, but put entries in alphabetical order by author’s last name. Have at least five entries (At least 2 sources have to be Non-Internet sources).