



# Experimental Design

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| <b>Description</b>           | Teams will design, conduct and report the findings of an experiment using provided materials.  |
| <b>Time Limit</b>            | 50 minutes   |
| <b>Team Size</b>             | Up to 3 students   |
| <b>Details</b>               | <ul style="list-style-type: none"> <li>➤ Teams will be provided a reporting form. (reverse side of paper)</li> <li>➤ Teams will be provided an identical set of materials. The container in which the materials are found will be considered one of the materials.</li> <li>➤ Teams must use at least two of the provided materials to design and conduct an experiment.</li> <li>➤ The teacher will assign a question/topic area that determines the nature of the experiment.</li> </ul>   |
| <b>Competition Scoring</b>   | <ul style="list-style-type: none"> <li>➤ Points will be awarded based on the rubric below. Points will be given based on the completeness of each response.<br/>Total Points: 52 Points               <ul style="list-style-type: none"> <li>○ Statement of Problem (2 points)</li> <li>○ Hypothesis (3 points)</li> <li>○ Variables: Constants (4 points), Independent Variable (2 points), dependent variable (2 points)</li> <li>○ Materials (3 points)</li> <li>○ Procedure (6 points)</li> <li>○ Observations (4 points)</li> <li>○ Data (5 points)</li> <li>○ Graphs (6 points)</li> <li>○ Statistics (2 points) (mean, median, mode, range, line of best fit)</li> <li>○ Analysis of Results (3 points)</li> <li>○ Possible Errors (3 points)</li> <li>○ Conclusion (4 points)</li> <li>○ Recommendations for Further Experimentation and Practical Applications (3 points)</li> </ul> </li> <li>➤ Any student not following proper safety procedures will be disqualified from the event.</li> </ul> |
| <b>Notebook Requirements</b> | <ul style="list-style-type: none"> <li>➤ Experimental Design PPT Notes</li> <li>➤ Record Sheet for Practice Run (2)</li> <li>➤ Analysis for Practice Run (1)</li> <li>➤ Notebook Points: 30</li> </ul>   |



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| <b>Timeline</b> | Practice Runs:<br>Competition Date: |
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## **EXPERIMENTAL DESIGN RECORD SHEET (CONDENSED)**

**Note:** These sections will be spaced out on the official record sheet, allowing for you to write your responses. Graph paper will be provided.

- 1. Statement of Problem**
- 2. Hypothesis**
- 3. Variables:**
  - Controlled:**
  - Independent:**
  - Dependent:**
- 4. Materials**
- 5. Procedure, including diagrams**
- 6. Qualitative Observations during experiment**
- 7. Data Table**
- 8. Graph (s)**
- 9. Statistical information/summary of results (choose from mean, median, mode, range, line of best fit)**
- 10. Analysis of Results/Conclusion**
- 11. Possible experimental errors**
- 12. Recommendations for further experimentation**
- 13. Practical applications of findings**



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