Project Components

Scientific Method and Narrative

All **projects** must use the Scientific Method and must **contain a variable** (some change in the procedure where comparisons can be made) that has been tested **with at least 5 trials**. A demonstration project models a scientific concept or principle without testing a variable. It displays facts or information and may be put on display, but will not be judged.

All the following components must be included in the project presentation except the extensive research paper which is optional. **The problem, hypothesis, procedure, observations/results and conclusion should appear on the presentations board.** All **other materials** are considered extraneous and should be **placed with the display in any optional space**, either on the board or on the table with the board.

I. **PROBLEM**: The question to be tested.

- Should be stated as an interrogative sentence implying more than a yes or no response.
- Should identify the independent variable (the factor that is changed or tested) and the dependent variable (what will be measured or should change).
- Examples: What is the effect of ___ on ___? or How do/does____ affect____? or To what extent do/does____affect____?

II. **HYPOTHESIS**: An educated guess that outlines what is believed to be the intended outcome of the experiment.

1. Should also contain a statement of why this outcome will be observed based on some kind of background knowledge.
   Participant may use any of the following models in helping them construct a hypothesis.
   If I _____then_____, because_____.
   _____, when I _____ because_____.
   If I change _____ then_____ will (change by) _____, because_____.
   The statement that _____ (is/is not) true because _____.
   (More/Less) _____ will _____, because _____.

III. **PROCEDURE**: A list of the steps used to conduct the experiment.

- Each statement should begin with an action verb and contain a description of the use of the constant, independent and dependent variables.
- A materials list should be included.
- Indicate a minimum of 5 trials.

IV. **OBSERVATIONS/RESULTS**: Collected quantitative data from the experiment.

1. Should be displayed with a chart, graph, pictures, log/journal or some other type of recording device that accurately shows what happened while the experiment was being conducted.
2. Should display data collection of 5 or more trials.

V. **CONCLUSION**: An interpretation/analysis of the observations/results of the experimental procedure.

- States whether the hypothesis was or was not supported.
- Answers the question "What was learned?".
- The results should be interpreted and justified, but should not be stated as a ***proof***.
- May contain a statement about further exploration.

VII. **NARRATIVE REPORT**: This 2-3 page, 12 font double-spaced document (if typed), excluding attached bibliography, is designed to help facilitate judging.

- Cover page is optional.
- Should give a brief overview of the project, a short review of research, and any other information that would provide evidence for assessing the project.
- Bibliography for :
- **4th and 5th** grade projects should contain **one or more** sources.
- **6th through 8th** grade projects should have a **minimum of 3** sources.
- **9th through 12th** grade projects should have a **minimum of 5** sources.

VIII. **RESEARCH PAPER**: ***Optional for grades 4-8. Mandatory for grades 9-12.***

- This paper may be any length and should contain researched information that supports the experiment.
- Should contain a complete bibliography of sources and be placed with extraneous materials.