

## Alternative HSPE Science Assessment: Guidelines for Experimental Design

**\*\*\*Although not an absolute requirement, students are strongly encouraged to submit an experimental design for an investigation that they have personally designed, planned, and conducted. \*\*\***

**Below are the areas to address in each section of the experimental design. Please respond in paragraph form.**

### 1) Introduction (100 points)

- What was your research question?
- What background information did you use or need to design your investigation?
- What was your hypothesis?
- How did you formulate your hypothesis?
- Do you believe your hypothesis is accurate? Why or why not?

### 2) Methods (100 points)

- What did you do to test your hypothesis to address your original question?
- What were the variables of your experiment (dependent and independent)?
- Which variable(s) are you manipulating? What was the reasoning that led to your choice(s)?
- What exactly did you (will you) measure or count? What comparison(s) are you making?
- How did you (will you) make measurements? Describe any appropriate statistical tests you would use to test your hypothesis.

### 3) Results (80 points)

- Provide a written narrative describing your results.
- Represent your collected data using appropriate graphs, tables, charts, etc.

### 4) Discussion (80 points)

- Based upon the data you collected during your investigation, what claim(s) were you able to make to address your research question?
- Does your data support your claims? Why or why not?
- Did you accept or reject your initial hypothesis? Why?
- How did your results fit with what you already knew, or have learned from other sources?
- Would you make the same hypothesis again, given the same set of circumstances? Why or why not?
- If you were able to repeat this experiment, what changes would you make to address possible sources of error that may have affected your results?
- Do you believe you would be able to replicate your results, given the same set of circumstances? Why or why not?
- How could your experiment be important in the application of this information to real world problems?

### 5) References (40 points)

- Quality of cited references using approved APA or MLA format
- Amount of cited references using approved APA or MLA format (see rubric for scale)