

## Assessment Criteria Checklist for Independent Science Investigations

### Identify a Researchable Question

- Define a scientific problem in biology or environmental conservation
  - Describe the need for the study or the source of the idea in the literature
- Formulate a statement of purpose and/or scientific question
- Formulate a testable hypothesis and make predictions
- Clearly explain how your research design follows from your question or hypothesis

### Plan and Conduct the Investigation

- Design and conduct scientific investigations related to the hypothesis
  - Define your variables and describe which are independent and dependent
  - Logically outline your methods and procedures
  - Document decisions made about study design and data collection
  - Demonstrate proper measurement techniques and sufficient sample size

### Analyze the Data, Interpret the Results, and Formulate Conclusions

- Accurately analyze and display data
  - Describe how you analyzed the data, noting assumptions or simplifications
  - Summarize data clearly using tables and graphs
  - Identify trends and outlying data that do not fit the trends
  - Identify potential sources of variability
- Interpret data and draw conclusions
  - Compare actual results to predicted results
  - State the meaning of the results in terms of the original research question
  - Compare trends in your graphs and summary data to published theory
  - Identify possible improvements in the study design
  - Suggest new directions for future research

### Communicate Effectively

- Communicate the study design and results in a level of detail and clarity that would allow others to replicate or improve your study
- Overall, state a convincing scientific argument by relating your question to evidence you gathered and to scientific theory from previously published work
  - Appropriately cite references
  - Organize ideas clearly
  - Use proper spelling and grammar