



Task Shell Example 12—Scientific Inquiry

Science Assessment Activity: Scientific Inquiry—Your Turn and Your World

In this activity, you will

- propose, design, and carry out an experiment;
- present your findings in a laboratory report; and
- make a presentation to your peers about what you learned.

Part I—The Experiment and Laboratory Report of Your Experiment

In this part of the assessment activity, you will propose, design, and carry out an experiment and communicate the experiment and results in a laboratory report. To propose your experiment, you must have it approved by your teacher. Use the form, Experimental Approval Form, before you proceed.

Important Note: Follow appropriate safety precautions based upon your experiment.

Your experiment and laboratory report should include the following:

(A) Purpose

- (a) A title
- (b) A clearly stated problem
- (c) (Optional) Research of the problem
- (d) A hypothesis stated in terms of cause and effect and based on observations and research information (if . . . then)

(B) Experimental design and procedures

- (a) A safe experimental design that addresses the cause and effect relationship in your hypothesis, includes appropriate controls, and considers the sample size necessary to study your problem
- (b) A safe implementation of the experiment as designed (or changes made based upon data collected)
- (c) Observations or measurements sufficient to address the question being asked and that are reproducible

(C) Data

- (a) Data collected, organized, analyzed, and displayed with appropriate statistics, graphs, and tables
- (b) Measurements taken that are repeatable, including a discussion of procedures and an analysis of experimental error

Science Assessed

- Ability to design and carry out an experiment
- Ability to draw conclusions from evidence
- Ability to represent and use data to make inferences and draw conclusions
- Ability to communicate findings in a laboratory report and defend findings in a presentation to your peers

(Continued)

(D) Conclusions

- (a) Conclusions drawn based upon the data and observations generated and that address all aspects of the hypothesis and original problem
- (b) Explanations provided for any experimental errors with suggestions for improved experimental design
- (c) Communication of your experiment and results

(E) Optional Analysis:

An analysis of the central tendencies of the data that includes any or all of the following: mean, median, standard deviation, range and interquartile ranges, and depending upon the nature of the experiment and data derived, a scatterplot with a line of best fit and the equation for that line, and the correlation coefficient. The analysis should include the meaning and implication of these findings.

Part II—Presenting Your Findings

Peer review of scientific findings has historically been an integral part of scientific research and the scientific community. Scientists present their findings to their peers through scientific journals, seminars, and conferences to name a few ways. Peers evaluate the experimental results in terms of the experimental design and consistency with other research methods and findings.

In this part of the activity, you will present your findings to your peers:

- Develop and complete a 5- to 8-minute presentation of your experiment and findings.
- Use visual aids, such as PowerPoint, overheads, or posters as part of the presentation. Visual aids should enhance understanding and meaning of the information being shared.
- Be prepared to field questions for an additional 3 to 5 minutes after your presentation.
- Consider other technologies to use in your presentations, such as video microscopes, digital cameras, spreadsheets, or databases.

Source: Adapted from assessment developed as part of the Wyoming Body of Evidence Consortium & Wyoming Department of Education Performance Assessment Project—Grade HS (2002–2004).



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