Scientific Inquiry Scoring Guide: Plain Language Student Version (High School)

2011-13

(Unofficial: to be used as a support for students as they learn to use the official scoring guide)

Process Dimensions	**6/5	4	3	2/1*
SI-Forming a Question or Hypothesis • **Scientific Question or hypothesis is formed** • **Science background information and/or preliminary observations are included** • **Question or hypothesis can guide the design of an effective investigation**	• A question or hypothesis is formed that points toward thorough knowledge of scientific relationships and/or has the potential to develop new knowledge. • Well documented background science knowledge and observations are used to establish a detailed reasoning for this investigation. • Question or hypothesis clearly guides the design of an effective or creative investigation.	• A scientifically testable question or hypothesis is formed. • Sufficient background science knowledge and/or preliminary observations to establish reasoning for this investigation are present. • The question or hypothesis is specific enough to guide the design of the investigation.	• A question or hypothesis is formed that cannot be adequately investigated through the collection and analysis of data. • Some relevant background information and/or preliminary observations is stated. • The question or hypothesis is not specific enough to guide the design of the investigation.	• The question or hypothesis is not scientifically testable. • Limited or irrelevant background science knowledge and observations are used. • The question or hypothesis cannot guide the design of an investigation.
SI- Designing an Investigation • **Materials, safety and procedure are listed** • **Variables and control(s) are identified** • **An experimental design that provides data of adequate quality and quantity exists (*Multiple Trials)***	• A scientifically logical, safe and ethical procedure that is both precise and efficient in design is formed. • Control(s) and relevant variables are thoroughly identified. • A design that will provide data of exceptional quality and quantity to address the question or hypothesis and to investigate possible patterns or relationships is present.	• A scientifically logical, safe and ethical procedure that can be easily followed is used. • Relevant variables are identified. • A design that will provide data of sufficient quality and quantity to address the question or hypothesis is present.	• A scientifically logical, safe and ethical procedure that can be easily followed is used, but with scientific or logical errors. • Some relevant variables are identified. • A design that will provide data of insufficient quality or quantity is present.	• A limited scientifically logical, safe or ethical procedure that cannot easily be followed is used. • Partially or incorrectly indentifies variables, or presents an investigative procedure that lacks enough detail to be followed. • A design that will provide not enough quality data is present.

**6 for a given dimension would have most of the list; 5 would have some of the list.
*2 for a given dimension would be inadequate in some of the list; while a 1 would be inadequate in most of the list.

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SI-Collecting and Presenting Data • **Data collection is consistent with investigation** • **Accurate raw data is displayed with appropriate units and labels** • **Data is displayed appropriately (charts, graphs, illustrations, tables, etc…)**	• Data is collected that is comprehensive, complete and detailed that is consistent with the design plan. • Accurate raw data using appropriate units with both quantity (number) and quality is consistent with the planned investigation. • Appropriate data is displayed in manner that utilizes formats (charts, graphs, illustrations, tables, etc..) that clarify and highlight relationships to be analyzed and communicated.	• Collects data that are consistent with design plan. • Records raw data using appropriate units and labels. • Appropriate data is displayed in a manner that communicates results in an organized format (charts, graphs, illustrations, tables, etc..) to facilitate scientific analysis and discussion.	• Collects incomplete data that are consistent with design plan. • Records raw data with incorrect or some missing units or labels. • Appropriate data is displayed in a manner that communicates that data is in an understandable way, but may be somewhat incomplete or disorganized.	• Records data that are inconsistent with design plan. • Records inaccurate data and is missing units or labels. • Displays inaccurate, incomplete or disorganized data.
SI-Analyzing and Interpreting Results • **A valid conclusion is drawn** • **Sources of error and uncertainties are analyzed** • **Communicates the findings using relevant scientific terminology to report results, data patterns, and reasonable explanations**	• A valid and comprehensive conclusion is included that addresses the question or hypothesis. Relationships in the data are identified and how the conclusion is supported by the data is explicitly explained. • The results are used to analyze and critique the design and procedures, providing significant sources of errors and how these might affect the results. • Communicates the findings and possible patterns using relevant science terms. Alternate justifications are used if needed.	• A valid conclusion that addresses the question or hypothesis and supports the conclusion is included. • Evidence is provided that the design, procedures, and data have been reviewed for sources of errors and discussion occurs on how these errors may affect the results. • Communicates the findings and possible patterns using relevant science terms.	• A conclusion that addresses the question or hypothesis is only partially supported by evidence (data) is included. • Minimal evidence that the design, procedures and data have been reviewed for sources of errors is presented. • Communicates the findings using general (non-scientific) terms.	• A conclusion that is not clearly related to the question or the hypothesis and is minimally supported by evidence (data) is included. • Incorrect evidence that the design, procedures, data have been reviewed for sources of errors is presented. • Communicates the findings with inaccurate terms to report results or proposes inaccurate explanations.

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