

2002 - 2008 Official Scientific Inquiry Scoring Guide CIM

	Forming a Question or Hypothesis <i>Based on observations and scientific concepts, ask questions or form hypotheses that can be answered or tested through scientific investigations.</i>	Designing an Investigation <i>Design a scientific investigation that provides sufficient data to answer a question or test a hypothesis.</i>	
6	<p>A) Provides a focused rationale for the investigation by using the most relevant background science knowledge or preliminary observations.</p> <p>N) Forms a question or hypothesis that focuses and defines an investigation of scientific relationships (e.g., interaction, dependency, correlation, causation).</p> <p>C) Expresses question or hypothesis along with the application of background information clearly enough to suggest specific investigative procedures.</p>	<p>A) Applies knowledge of scientific research and procedures to create or adapt a design that is controlled, precise, safe, ethical, and consistent with accepted scientific practice.</p> <p>N) Presents a practical design that should provide reliable and valid data sufficient to answer the question or test the hypothesis and to explain the relationship(s).</p> <p>C) Communicates a unified (but flexible) design and logical, detailed procedures that can be fully replicated anticipating possible need for adjustment.</p>	6
5	<p>A) Provides background science knowledge or preliminary observations which are connected to the investigation.</p> <p>N) Forms a question or hypothesis that generally points toward an investigation of scientific relationships (e.g., interaction, dependency, correlation, causation).</p> <p>C) Expresses question or hypothesis along with the explanation of background information clearly enough to imply a particular investigative design.</p>	<p>A) Applies scientific knowledge to create or adapt a design with precise, safe, and ethical procedures.</p> <p>N) Presents a practical design that should provide data of sufficient quantity and quality to answer the question or test the hypothesis and investigate possible relationships.</p> <p>C) Communicates a unified design and logical, detailed procedures that can be reviewed, replicated, and revised.</p>	5
4	<p>A) Provides background science knowledge or preliminary observations that are relevant to the investigation.</p> <p>N) Forms a question or hypothesis that can be answered or tested using data gathered in a scientific investigation.</p> <p>C) Expresses question or hypothesis along with the explanation of background information clearly enough to imply an appropriate investigative approach.</p>	<p>A) Proposes scientifically logical, safe, and ethical procedures in a design with only minor scientific errors.</p> <p>N) Presents a practical design that should provide data of sufficient quantity and quality to answer the question or test the hypothesis (i.e., fair test).</p> <p>C) Communicates an organized design and procedures that have enough detail that they could be followed and revised.</p>	4
3	<p>A) Provides background science knowledge or preliminary observations that are either irrelevant or incomplete.</p> <p>N) Forms a question or hypothesis that can be investigated using data but not directly answered or tested.</p> <p>C) Expresses a question or hypothesis along with the explanation of background information that is understandable, but does not imply a direction for an investigation.</p>	<p>A) Proposes safe, ethical procedures in a design that contains some significant scientific errors.</p> <p>N) Presents a design that should provide relevant data but not sufficient to fully answer the question or test the hypothesis.</p> <p>C) Communicates a general plan and some procedures that can be followed.</p>	3
2	<p>A) Provides background science knowledge or preliminary observations that are inappropriate or substantially incorrect.</p> <p>N) Forms a question or hypothesis that cannot be investigated using data.</p> <p>C) Either question or hypothesis or background information is unclear.</p>	<p>A) Uses little scientific knowledge or does not consistently use reasonable, safe, or ethical procedures in a proposed design.</p> <p>N) Presents a design that should provide data somewhat applicable to the question or hypothesis.</p> <p>C) Communicates a summary of a plan that generally can be followed.</p>	2
1	<p>A) States a question or hypothesis without supporting background information.</p> <p>N) Forms a question or hypothesis that cannot be answered or tested.</p> <p>C) Background information is not included.</p>	<p>A) Uses minimal or incorrect scientific knowledge and unacceptable procedures in a proposed design.</p> <p>N) Presents a design that will not provide applicable data.</p> <p>C) Communicates a plan that is unclear or illogical.</p>	1

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	Collecting and Presenting Data <i>Collect, organize, and display sufficient data to facilitate scientific analysis and interpretation.</i>	Analyzing and Interpreting Results <i>Summarize and analyze data, evaluating sources of error or bias. Propose explanations that are supported by data and knowledge of scientific terminology.</i>	
6	<p>A) Records accurate data consistent with complex procedures and deals with anomalous data, as needed.</p> <p>N) Transforms data into visually powerful displays/formats that clarify and highlight relationship(s) to be analyzed and explained.</p> <p>C) Creates precise and thorough displays (e.g., tables) for communicating observations or measurements, using appropriate units, in a logical and organized fashion.</p>	<p>A) Apply scientific terminology or notation correctly to analyze and explain relationship(s) investigated.</p> <p>N) Analyzes and critiques the design and procedures in light of the results and suggests insightful revisions or extensions.</p> <p>C) Explicitly analyzes the results of the investigation to support conclusions that address the question, hypothesis and relationship(s) investigated.</p>	6
5	<p>A) Records accurate data completely consistent with the planned procedure.</p> <p>N) Chooses data transformations that highlight information and patterns and support interpretation of relationships.</p> <p>C) Creates thorough displays (e.g., tables) for communicating observations or measurements, using appropriate units, that are logical and organized.</p>	<p>A) Uses scientific terminology or notation with minimal errors to report results, discuss relationships, and propose explanations.</p> <p>N) Provides evidence that the design, procedures, and results have been reviewed to identify important limitations and sources of error, suggesting design improvements when appropriate.</p> <p>C) Explicitly analyzes the results of the investigation to support conclusions that address the question or hypothesis and any relationships discovered.</p>	5
4	<p>A) Records reasonable data consistent with the planned procedure.</p> <p>N) Chooses data transformations that are valid and facilitate scientific analysis and interpretation.</p> <p>C) Creates displays (e.g., tables) for communicating observations or measurements, using appropriate units, that are logical and organized.</p>	<p>A) Uses scientific terminology with minimal errors to report results, identify patterns, and propose explanations.</p> <p>N) Provides evidence that the design, procedures, and results have been reviewed to identify some obvious limitations or sources of error.</p> <p>C) Explicitly uses the results of the investigation to support conclusions that address the question or hypothesis.</p>	4
3	<p>A) Records reasonable data consistent with the planned procedure with some obvious errors.</p> <p>N) Chooses data transformations that are valid and complete but do not facilitate scientific analysis and interpretation.</p> <p>C) Creates displays (e.g., tables) for communicating observations or measurements that are understandable, but somewhat incomplete or disorganized.</p>	<p>A) Uses scientific terminology, with some significant errors, to report results, identify patterns and propose explanations.</p> <p>N) Provides evidence that the design, procedures, and results have been reviewed but deals with errors and limitations in a trivial or illogical manner.</p> <p>C) Develops conclusions related to the question or hypothesis, but support from the investigation is either incomplete or not explicit.</p>	3
2	<p>A) Records data inconsistent with the planned procedure.</p> <p>N) Chooses data transformations that are sometimes invalid or incomplete.</p> <p>C) Creates displays (e.g., tables) for communicating observations or measurements that are substantially inaccurate, incomplete, or disorganized.</p>	<p>A) Uses scientific terminology incorrectly to report results, identify patterns or propose explanations.</p> <p>N) Provides minimal evidence that the design, procedures, and results have been reviewed.</p> <p>C) Presents interpretations or conclusions that are not clearly related to the question or hypothesis or supported by the results.</p>	2
1	<p>A) Records data unrelated to the planned procedure.</p> <p>N) Presents results in ways that are confusing or incorrect.</p> <p>C) Does not display data.</p>	<p>A) Does not clearly explain results or use scientific knowledge correctly.</p> <p>N) Does not provide evidence that the design or procedures have been reviewed.</p> <p>C) Does not present any interpretations.</p>	1