

(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*
<p><u>SI-Forming a Question or Hypothesis</u></p> <ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● A question or hypothesis is formed that can be scientifically tested and demonstrates thorough knowledge of scientific relationships. ● 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. 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● A question or hypothesis is partially formed that could still be scientifically investigated. ● Some relevant background information and/or preliminary observations are stated. ● The question or hypothesis is not specific enough to guide the design of the investigation. 	<ul style="list-style-type: none"> ● The question or hypothesis is not scientifically testable. ● Irrelevant background science knowledge and observations are used. ● The question or hypothesis cannot guide the design of an investigation.
<p><u>SI- Designing an Investigation</u></p> <ul style="list-style-type: none"> ● Materials, safety and procedure are listed ● Variables and control(s) are identified ● Appropriate use of resources/materials and techniques 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● A scientifically logical, safe and ethical procedure that can be easily followed is used. ● Relevant variables and controls are identified. ● A design that uses appropriate resources/materials and techniques to collect relevant data is present. 	<ul style="list-style-type: none"> ● A scientifically logical, safe and ethical procedure that can be easily followed is used, but with a few scientific errors. ● Some relevant variables are identified. ● A design that uses insufficient resources/materials and techniques to collect relevant data is present. 	<ul style="list-style-type: none"> ● Procedures that are hard to follow and/or include significant scientific errors are included. ● Partially or incorrectly identifies variables or controls. ● A design that lacks the necessary resources/materials and techniques to collect relevant 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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<p><u>SI-Collecting and Presenting Data</u></p> <ul style="list-style-type: none"> • Data collection is consistent with investigation design • Accurate raw data is displayed with appropriate units and labels • Data is displayed appropriately (charts, graphs, illustrations, tables, etc...) 	<ul style="list-style-type: none"> • Detailed data is collected that is consistent with the design plan. • Accurate raw data is carefully recorded in a detailed and organized manner. • Appropriate data is displayed in manner that clarifies and highlights patterns to be analyzed and communicated. 	<ul style="list-style-type: none"> • Collects data that are consistent with design plan. • Accurate raw data is collected in an organized manner. • Appropriate data is displayed in a manner that communicates results in an organized format to facilitate scientific analysis and discussion. 	<ul style="list-style-type: none"> • Collects incomplete data that are consistent with design plan. • Relevant data is collected in an inconsistent or disorganized manner. • Data is displayed in a manner that is understandable, but may be somewhat incomplete or disorganized. 	<ul style="list-style-type: none"> • Records data that are inconsistent with design plan. • Irrelevant or inaccurate data is collected and displayed • Displays incomplete or disorganized data.
<p><u>SI-Analyzing and Interpreting Results</u></p> <ul style="list-style-type: none"> • Data Analysis and Evidence Based Explanation of Results • Communicates conclusions including possible sources of error • Relates results to Question or Hypothesis with relevant revisions or possible new investigations 	<ul style="list-style-type: none"> • A valid and comprehensive explanation is included that addresses the question or hypothesis. Relationships in the data are identified and how the results relate to other scientific information is included. • Clearly communicates the conclusions including sources, size, and significant sources of error and how these might affect the results (data) • Relates detailed results to question or hypothesis. Suggests and describes further investigations based on data analysis. 	<ul style="list-style-type: none"> • An evidence-based explanation that addresses the question or hypothesis and supports the conclusion is included. • Clearly communicates conclusions including possible sources of error and how these might affect the results (data). • Relates results to question or hypothesis. Suggests relevant experimental design revisions or further investigations based on data analysis. 	<ul style="list-style-type: none"> • A partial analysis of the data and general explanation of the results is included. • Communicates conclusions in a general manner, sources of error or invalid or common. • Partially relates results to question or hypothesis. Suggests relevant revisions to the experimental design without reasoning. 	<ul style="list-style-type: none"> • Data is inaccurately analyzed and a simplistic explanation of the results is included. • Communicates incomplete conclusions and sources of error are either missing or invalid. • Does not relate results to question or hypothesis. Suggested revisions are unrelated to the investigation.

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