

Capital Community College Scientific Reasoning (SR) Rubric

Outcome	Scale	4 – Highly Competent	3 – Competent	2 – Minimally Competent	1 – Not Competent
SR1 - Explain the methods of scientific inquiry that lead to the acquisition of knowledge. Such methods include observations, testable hypotheses, logical inferences, experimental design, data acquisition, interpretation, and reproducible outcomes.		Student provided all appropriate or relevant explanations on the methods they used. All explanations were clear, complete and related to the problem posed.	Most explanations were clear, complete, and related to the problem posed.	Most explanations were: incomplete or not related to the problem posed or not provided.	Student did not provide: any explanations or understandable explanations or explanations related to the problem posed.
SR2 - Apply scientific methods to investigate real-world phenomena, and routine and novel problems. This includes data acquisition and evaluation, and prediction.		Student successfully applied scientific methods to investigate problem(s). All applications were efficient, complete, correct and related to the problems posed.	Student successfully applied most scientific methods to investigate problem(s). Most applications were complete, correct and related to the problems posed.	Student successfully applied some scientific methods to investigate problem(s). Most applications were incomplete or incorrect or not related to the problems posed.	Student did not apply: any scientific methods or scientific methods correctly.

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Outcome				
SR3 - Represent scientific data symbolically, graphically, numerically, and verbally.	<p>Identifies relevant data in connection with the argument or purpose of the work.</p> <p>Converts and presents scientific data accurately.</p> <p>Presents data in an appropriate manner, such as: a database, graphs, tables, images, symbols or descriptions, and: Organizes scientific data in a way that provides for clear interpretation:</p> <ul style="list-style-type: none"> ○ Units are always included. ○ When appropriate, features such as descriptive titles, labels, legends, and keys are used. ○ When appropriate, data are ranked, grouped or tabulated. 	<p>Identifies relevant data but not entirely in connection with the argument or purpose of the work.</p> <p>Converts data with minor errors and/or presents scientific data with minor inaccuracies.</p> <p>Presents data in an appropriate manner, such as: a database, graphs, tables, images, symbols or descriptions, and: Almost always organizes scientific data in a way that provides for clear interpretation:</p> <ul style="list-style-type: none"> ○ Units are almost always included. ○ When appropriate, features such as descriptive titles, labels, legends, and keys are used, but clarity would be enhanced with added detail or more labels. ○ When appropriate, data are ranked, grouped or tabulated. 	<p>Identifies relevant data but not in connection with the argument or purpose of the work.</p> <p>Converts data with major errors or presents scientific data with major inaccuracies.</p> <p>Presents data, but the manner of presentation is not particularly well suited for the task at hand or: Organizes scientific data in a way that somewhat impedes clear interpretation:</p> <ul style="list-style-type: none"> ○ Units are sometimes included. ○ When appropriate, features such as descriptive titles, labels, legends, and keys are used, but not all necessary and appropriate features are included, or most features are only marginally descriptive. ○ Data are ranked, grouped or tabulated in an inconsistent or haphazard manner. 	<p>Does not identify relevant data and does not connect it with the argument or purpose of the work.</p> <p>Converts data with major errors and presents scientific data with major inaccuracies.</p> <p>Presents data, but the manner of presentation is not particularly well suited for the task at hand and/or: Organizes scientific data in a way that severely impedes clear interpretation:</p> <ul style="list-style-type: none"> ○ Units are not included. ○ There is a lack of descriptive titles, labels, legends, and keys that makes accurate interpretation of the data impossible. ○ Data are ranked, grouped or tabulated in an inconsistent, haphazard, or unintelligible manner.

Scale	4 – Highly Competent	3 – Competent	2 – Minimally Competent	1 – Not Competent
SR4 - Interpret scientific information and draw logical inferences from representations such as formulas, equations, graphs, tables, and schematics.	<p>Almost always provides accurate explanations of information.</p> <p>Almost always makes appropriate interpretation of formulas, equations, graphs, tables and/or schematics. Interpretation contains all critical elements.</p> <p>Almost always uses scientific information to draw logical inferences in connection with the argument or purpose of the work.</p> <p>Almost always presents scientific information with comparisons and/or contextual information that gives it meaning.</p>	<p>Frequently provides accurate explanations of information.</p> <p>Frequently makes appropriate interpretation of formulas, equations, graphs, tables and/or schematics. Interpretation frequently contains all critical elements.</p> <p>Frequently uses scientific information to draw logical inferences in connection with the argument or purpose of the work.</p> <p>Frequently presents scientific information with comparisons and/or contextual information that gives it meaning.</p>	<p>Sometimes provides accurate explanations of information.</p> <p>Sometimes makes appropriate interpretation of formulas, equations, graphs, tables and/or schematics. Interpretation sometimes contains all critical elements.</p> <p>Sometimes uses scientific information to draw logical inferences in connection with the argument or purpose of the work.</p> <p>Sometimes presents scientific information with comparisons and/or contextual information that gives it meaning.</p>	<p>Seldom provides accurate explanations of information.</p> <p>Seldom makes appropriate interpretation of formulas, equations, graphs, tables and/or schematics. Interpretation seldom contains all critical elements.</p> <p>Seldom uses scientific information to draw logical inferences in connection with the argument or purpose of the work.</p> <p>Seldom presents scientific information with comparisons and/or contextual information that gives it meaning.</p>

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Outcome				
SR5 - Evaluate the results obtained from scientific methods for accuracy and/or reasonableness.	<p>Uses scientific analysis of data as basis for deep and thoughtful judgment, drawing insightful conclusions from the work</p> <p>A correct and complete evaluation of the results is clearly presented. There are no errors in correlation and causation. When appropriate, source credibility is fully explored.</p> <p>Explicitly describes assumptions and provides detailed rationale for the appropriateness of each assumption.</p>	<p>Uses scientific analysis of data as the basis for competent judgments, drawing reasonable conclusion from the work.</p> <p>An evaluation of the results is presented with minor inaccuracies. There are seldom errors in correlation and causation. When appropriate, source credibility is explored.</p> <p>Frequently describes assumptions and provides adequate rationale for the appropriateness of each assumption.</p>	<p>Sometimes uses scientific analysis of data as basis for judgments, drawing plausible conclusions from the work.</p> <p>An evaluation of the results is presented with major inaccuracies. There are frequent errors in correlation and causation. When appropriate, source credibility is rarely explored.</p> <p>Sometimes describes assumptions and provides some rationale for the appropriateness of each assumption</p>	<p>Seldom uses scientific analysis of data as basis for basis judgments and seldom draws plausible conclusions from the work.</p> <p>An evaluation of the results is presented with major inaccuracies and/or is incoherent. There are almost always errors in correlation and causation. When appropriate, source credibility is not explored.</p> <p>Seldom describes assumptions and does not provide rationale for the appropriateness of each assumption.</p>