SCIENTIFIC REASONING VALUE RUBRIC

Revised: October 8th, 2019

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.
This rubric aligns with student learning outcome 2

Outcome: Demonstrate knowledge and understanding of scientific reasoning and how new knowledge is acquired in one or more areas of science, including the selection and use of appropriate methods, tools, and technology for answering questions and solving problems.

		Level				
Domain	**4**	**3**	**2**	**1**	**0**	**NA**
Methodology. Recognizing methods of inquiry that lead to scientific knowledge	Demonstrates advanced ability to propose a reasonable method or experimental design to solve a problem or answer a question that includes all necessary elements with no flaws that will interfere with interpretation of results.	Demonstrates basic ability to propose a reasonable method or experimental design to solve a problem or answer a question that includes all necessary elements, but might include one or more flaws that will interfere with interpretation of results.	Demonstrates ability to apply vocabulary by correctly identifying some elements of methodology and experimental design, but elements needed to solve a problem or answer a question are missing.	Demonstrates definitional knowledge of vocabulary associated with methodology and experimental design, but does not demonstrate the ability to apply the methodology/experimental design to solve a problem or answer a question.	Does not demonstrate definitional knowledge of vocabulary associated with methodology and experimental design, and does not demonstrate the ability to apply the methodology/experimental design to solve a problem or answer a question.	
Analysis & Reasoning. Deduction, induction, and analogy.	Demonstrates advanced ability to apply scientific reasoning and analysis by appropriately applying deduction, induction, or analogy to a complex set of data or results to draw a reasonable conclusion. Analysis does not include obvious flaws.	Demonstrates basic ability to apply scientific reasoning and analysis by appropriately applying deduction, induction, or analogy to a simple set of data or results to draw a reasonable conclusion. Analysis might include one or more flaws.	Demonstrates ability to apply vocabulary by correctly identifying examples of scientific reasoning and analysis, but deduction, induction, or analogy are inappropriately applied to a set of data or results.	Demonstrates definitional knowledge of vocabulary associated with scientific reasoning and analysis, but does not demonstrate the ability to apply deduction, induction, or analogy to a set of data or results.	Does not demonstrate definitional knowledge of vocabulary associated with scientific reasoning and analysis; also does not demonstrate the ability to apply deduction, induction, or analogy to a set of data or results.	
Conclusions. Limitations and Implications; Causation and Correlation.	Demonstrates advanced ability to draw reasonable conclusions from evidence, including recognizing limits of	Demonstrates basic ability to draw reasonable conclusions from evidence, but the conclusions might	Demonstrates ability to apply vocabulary by correctly identifying examples of conclusions, implications,	Demonstrates definitional knowledge of vocabulary associated with scientific conclusions, but does	Does not demonstrate definitional knowledge of vocabulary associated with scientific conclusions; also does	

	the strength of conclusions and stating important or obvious implications.	extend beyond the actual evidence or might lack important or obvious implications.	causation, and correlation, but inappropriately draws conclusions and lacks implications.	not demonstrate an understanding of conclusions, implications, causation, or correlation.	not demonstrate an understanding of conclusions, implications, causation, or correlation.	

The following rubric applies to learning outcome 3:

Outcome: Relate scientific principles and methods to problems that are important to individuals and societies

		Level				
Domain	**4**	**3**	**2**	**1**	**0**	**NA**
Relate scientific principles and methods to problems that are important to individuals and societies	Demonstrates advanced ability to relate scientific principles and methods to problems that are important to individuals and societies, without obvious flaws in logic.	Demonstrates basic ability to relate scientific principles and methods to problems that are important to individuals and societies, but may have flaws in logic.	Demonstrates ability to relate scientific principles and methods to problems that are important to individuals and societies, but lacks key details.	Demonstrates definitional knowledge of scientific principles and methods, but lacks the ability to relate them to problems for individuals and societies.	Does not demonstrate definitional knowledge of scientific principles and methods; also lacks the ability to relate them to problems for individuals and societies.	