Virginia State University General Education
SCIENTIFIC LITERACY RUBRIC

Definition

Scientific Literacy is the ability to analyze and apply basic scientific principles and methods of scientific research and inquiry to make informed decisions and engage with issues related to the natural, physical, and social world.

Glossary
The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Credibility or credible source:** refer to reliable sources. The references are acceptable, free from bias, backed up with evidence, trustworthy, and valid according to professionals in the subject areas.
- **Ethical implications** of scientific research and practices refer to the moral considerations and consequences associated with scientific inquiry's conduct, outcomes, and applications. Some common ethical implications include informed consent, protection of human subjects, animal welfare, conflict of interest, data integrity and reproducibility, publication, and cultural sensitivity.
- **Legal implications** of scientific research and practices pertains to the legal obligations, regulations, and potential consequences associated with conducting scientific inquiry, utilizing research findings, and implementing technological innovations. Some common legal implications include intellectual property rights, regulatory compliance, research funding and grants, privacy and data protection, product liability, health and safety regulations, human subjects, environmental regulations, and professional standards and codes of conduct.
- **Reliability or reliable source**: A dependable source that provides a thorough, well-reasoned theory, argument, discussion, etc., based on solid evidence. A source that experts in your subject domain would agree is valid for your purposes.
- **Peer-Reviewed Articles:** provide detailed descriptions of research methods, results, and conclusions, supported by evidence and references to other scholarly work. They are typically published in academic journals and written by scholars, researchers, or professionals with expertise in a specific subject area.
- **Popular Media sources:** include newspapers, magazines, websites, social media, and television programs. These sources often provide news coverage, feature articles, or opinion pieces on scientific topics but may not always adhere to rigorous scientific standards. Popular media sources may oversimplify or sensationalize scientific findings to attract readers or viewers, leading to potential misunderstandings or inaccuracies.
- **Pseudoscience:** refers to beliefs, theories, or practices that claim to be scientific but lack empirical evidence, fail to adhere to scientific principles, and are not supported by the scientific community. Pseudoscientific claims often rely on anecdotal evidence, logical fallacies, or misinterpretations of scientific research to support their assertions.
- **Scientific method**: various methods of analysis are employed across different disciplines to investigate phenomena, test hypotheses, and draw conclusions based on empirical evidence. *Examples include qualitative, quantitative, action research, mixed methods, experimental research, case study, meta-analysis, and modeling and simulation.*

- **Scientific reasoning skills:** are fundamental abilities that enable individuals to think critically, analyze information, solve problems, and make informed decisions within the context of scientific inquiry. These skills are essential for understanding and applying scientific concepts, conducting research, and evaluating evidence. Some key scientific reasoning skills include observation, hypothesis formation, research design, data collection and analysis, and deductive reasoning.

- N/A: Not applicable to the assignment. Artifact is not appropriate for the assessment of this SLO.

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	Exceed Standard	Meets Standard (Assess @ Reinforce)	Approaching	Introduction (Assess @ Introduce)	Not Evident Or Not Applicable
	4	3	2	1	0 / N/A
SLO 1: Identify the credibility and reliability of scientific sources by distinguishing among peer-reviewed articles, popular media, and pseudoscience.	Demonstrates a deep understanding and consistently identifies and effectively distinguishes their differences with clear and accurate reasoning.	Demonstrates a good understanding and mostly accurately identifies and distinguishes their differences with adequate reasoning.	Demonstrates a fair understanding and partially identifies and distinguishes their differences with some reasoning.	Demonstrates a partial understanding and inconsistently identifies and distinguishes differences with limited reasoning.	Did not address the established standard. Not applicable to the assignment.
SLO 2: Compare different scientific methods of analysis and investigate their use in evaluating empiric information. Applies a systematic approach to comparing scientific methods based on methodological considerations, advantages, disadvantages, and context and purpose	Student thoroughly compares and analyzes different scientific methods of analysis, providing clear examples and evidence of their application in evaluating empirical information.	Student adequately compares and analyzes different scientific methods of analysis, providing relevant examples and evidence of their application in evaluating empirical information.	Student moderately compares and analyzes different scientific methods of analysis, providing some examples and evidence of their application in evaluating empirical information.	Student partially compares and analyzes different scientific methods of analysis, providing limited examples and evidence of their application in evaluating empirical information.	Did not address the established standard. Not applicable to the assignment.
SLO 3: Discuss ethical, legal, economic, social, cultural, and environmental implications of scientific research and practices.	Demonstrates a comprehensive understanding and effectively discusses past, present, or future ideas about science based on these impacts and how it has or can	Demonstrates a good understanding and adequately discusses past, present, or future ideas about science based on these impacts and how it has or can evolve with relevant	Demonstrates a basic understanding and moderately discusses past, present, or future ideas about science based on these impacts and how it has or can evolve with relevant	Demonstrates a partial understanding and somewhat discusses past, present, or future ideas about science based on these impacts and how it has or can evolve with limited	Did not address the established standard. Not applicable to the assignment.

	evolve with insightful analysis and clear connections.	analysis and connections	analysis and connections.	analysis and connections.	
SLO 4: Apply scientific reasoning skills to analyze and solve problems, interpret scientific data, draw conclusions, and make evidence-based decisions.	Applies complete and logical steps to solving a problem. Selects a scientific principle or concept, discusses rationale for selecting the principle, and applies the principle to solve the problem.	Applies logical steps to solving a problem. Selects a scientific principle or concept and applies the principle to solve the problem	Applies steps to solving a problem, but a few steps are missing or not applied correctly. Demonstrates a basic ability to determine conclusions or solve the problem.	Applies steps to solving a problem, but some steps are missing or not applied correctly. Demonstrates a limited ability to determine conclusions or solve the problem.	Did not address the established standard.

Not applicable to the assignment. |