

## Scientific Reasoning Rubric

Skills	Beginning (1)	Developing (2)	Competent (3)	Accomplished (4)
<b>Student can describe methods of scientific inquiry and apply them to investigating, questioning and solving problems</b>	The student cannot:	The student can:	The student can:	The student can:
	Identify a scientific problem	Identify and clearly state a scientific problem	Restate the scientific problem in a question format	Develop a proper research question
	Recognize that problems have solutions	Select one possible solution to the problem	Predict one or more possible solutions to the problem	Evaluate alternate solutions to the problem
	Recognize the definition of an hypothesis	Select a hypothesis appropriate to the problem	Generate a testable hypothesis appropriate to the problem	Propose how to evaluate a hypothesis appropriate to the problem
<b>Student can describe and carry out experimental procedures.</b>	The student <b>cannot</b> :	The student can:	The student can:	The student can:
	Recognize the purpose/ objective of an experiment	State the purpose/ objective of the experiment in their own words	State the purpose/ objective of the experiment in their own words	Explain the purpose/ objective of the experiment in their own words
	Determine the materials needed to complete the experimental procedure	Determine the materials needed to complete the procedure	Determine the materials needed to complete the procedure	Determine the materials needed to complete the procedure
	Recognize experimental variables	Differentiate between independent and dependent variables	Differentiate between independent, dependent, and confounding variables and controls	Select the experimental variables and controls
			Describe the relationship between the experimental steps	Manipulate the experimental variables and controls
				Suggest modifications of the experimental design, as appropriate
<b>Student can perform laboratory tasks appropriate to the field.</b>	The student <b>cannot</b> :	The student can, with frequent reminders:	The student can independently:	The student takes initiative to:
	Obey safety rules and handle lab equipment safely	Obey safety rules and handle lab equipment safely	Obey safety rules and carefully handle lab equipment	Obey safety rules and carefully handle lab equipment
	Follow written procedures	Follow written procedures accurately	Follow written procedures accurately	Follow written procedures accurately
	Identify scientific tools appropriate to the task	Employ scientific tools with proper technique	Employ scientific tools with proper technique	Employ scientific tools with proper technique
	Work independently	Measure and record data	Measure and record data with minimal errors	Measure and record data accurately

<b>Student can interpret and communicate scientific information using written, oral and/or graphical means</b>	The student <b>cannot</b> :	The student can:	The student can, with few errors:	The student can, with few to no errors:
	Interpret quantitative information from tables and graphs using basic vocabulary	Interpret quantitative information from tables and graphs using vocabulary appropriate to the discipline	Interpret quantitative information from tables and graphs results using technical vocabulary	Accurately interpret quantitative information using highly technical vocabulary and make appropriate inferences
		Construct data tables and represent information graphically	Independently construct data tables and represent information graphically.	Independently construct data tables and represent information graphically
			Communicate experimental or investigative results	Clearly communicate experimental or investigative results
			Draw logical conclusions from collected data	
<b>Student can describe and analyze one or more relationships among science, technology and society and demonstrate an understanding of scientific applications in everyday life</b>	The student <b>cannot</b> :	The student can:	The student can:	The student can:
	Identify a technological breakthrough and its connection to science	Identify a technological breakthrough and its connection to science	Identify a technological breakthrough and its connection to science	Identify a technological breakthrough and its connection to science
		Place a technological breakthrough in an historical context	Place a technological breakthrough in an historical context	Place a technological breakthrough in an historical context
		Explain some of its impacts on society	Explain some of its impacts on society	Explain and analyze some of its impacts on society
		Explain one or more scientific principles behind a technology	Explain one or more scientific principles behind a technology	Describe examples or possible future developments related to science, technology and society
<b>Student can demonstrate logical reasoning in explaining natural phenomena, experimental procedures or outcomes, and/or application of scientific or technological concepts.</b>	The student struggles to:	The student can:	The student can:	The student can:
	Identify logical explanations for observed phenomena	Identify logical explanations for observed phenomena	Identify possible alternative logical explanations for observed phenomena	Develop possible alternative logical explanations for observed phenomena
		Identify fallacies or illogical conclusions based on observations	Identify fallacies or illogical conclusions based on observations or data	Describe fallacies or illogical conclusions based on observations or data
			Evaluate claims based on observation, experimentation or data presented	