

Tiered Science Rubric 01/06/03		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	
		◀ Grade 9 ▶								
				◀ Grade 10 ▶						
					◀ Grade 11 ▶					
						◀ Grade 12 ▶				
Investigate a Problem	Background	Brief research	Broad research on general topics, indirectly related to question & hypothesis		Focused research that directly relates to question & hypothesis		Synthesizes information from various sources smoothly Integrates theoretic models relevant to investigation		Finds appropriate sources using peer reviewed scientific journals	
	Sources	Does not cite sources Does not paraphrase		Occasionally cites sources Partial paraphrasing		Cites sources appropriately Paraphrases consistently and accurately		Thoroughly cites sources for quotes and ideas Smoothly links paraphrased pieces to own ideas		
	Question	Produces testable question with help	Produces testable question independently		Knowledge of independent and dependent variables justifies testable question		Testable question demonstrates clear relevance and value to society		Systematic manipulation of multiple variables results in final testable question	
	Hypothesis	Makes simple prediction		Draws on previous experience or observations		Reflects some understanding of background research and integrates prior observations	Reflects a synthesis of background research and prior observations and states degree of certainty	Predicts future events using theoretical models		
Design an experiment	Materials and Diagram	Complete materials listed Diagram illustrates individual materials		Materials are listed in specific amounts and correctly named					Multiple independent and dependent variables are incorporated systematically into materials and methods	
				Diagram represents set-up		Schematic diagram(s) shown				
	Procedure	Brief outline		Sequential procedure		Sequential procedure generated and independently documented		Exactly reproducible	Recognizes experimental limits and relevance of controls	
	Variables	Can identify independent and dependent variables with help		Can identify ind. and dep. variables without help		Knowledge of ind and dep variables defines materials and methods, controls are stated in design				
Data and Results	Collection	Describe qualitative observations	Make relevant qualitative observations and measure quantitative data		Make series of observations, comparisons and measurements with precision		Uses wide range of apparatus, identifies need for additional data collection and repetition		Collects data to test multiple variables and repeats tests for outliers	
	Organization	Record observations and measured quantities	Includes labeled data table and graph	Includes descriptive table headings, graph title, axis labels with units, and clear legends		Independently chooses appropriate graph type	Independently plots correct and relevant variables	Independently applies correct trend line, consolidates multiple data sets into best communicative graph	Graph self-sufficiently demonstrates conclusion	
	Analysis		Simply repeats numbers in explanation	Identifies general trends in the numbers	Uses basic algebraic functions for analysis (avg)	Uses statistical analysis (stdev, R ²)	Discerns patterns in the data and identifies outliers	Uses basic algebra and more than one statistical test to assess reliability of data		
Conclusion and Discussion	Supporting hypothesis with data	Indicates simple conclusion		Conclusion addresses hypothesis and is supported by numerical data			Conclusion summarizes all findings and discusses connections to research		Conclusion integrates all findings, indicates degree of certainty, quantifies magnitude of error	
	Error analysis		Lists sources of error		Evaluates experimental method for sources of error		Evaluates the magnitude of possible errors by showing how it affects results			
	New directions			Lists possible improvements apart from eliminating errors	Lists new directions for experiment	Suggest improvements to experiment based on error analysis Accurately determines limits of theoretical models	Discusses how improvements would affect results, new directions are logical and insightful		Identifies additional patterns in data set, derives theoretical model and uses it to predict future results	