

## Assessment of Overall Quantitative Literacy

Topic	Proficient	Adequate	Deficient
Logical Quantitative Reasoning <u>and Analysis</u>	Can understand problems and develop their own innovative logical quantitative analyses	Can follow and reproduce logical quantitative analyses	Analyses are based principally on random thoughts and guesswork
Validity, applicability, and limitations of quantitative arguments	Adept at developing valid quantitative arguments and understanding their assumptions, applicability, and limitations	Can apply learned arguments to similar problems, but also tries to apply them to problems which are beyond the scope of the argument/analysis	Tries to solve all problems using the same strategies without adaptation.

## Assessment of Specific Literacies

Topic	Proficient	Adequate	Deficient
Algebraic / symbolic approaches	Understands functional relationships, can manipulate symbols, and can draw conclusions from each. Can effectively solve novel word problems.	Can reliably manipulate algebraic/symbolic expressions. Can handle more than one equation at a time. Can identify and apply similar methods to corresponding word	Can only “plug and chug”. Makes frequent mistakes when manipulating equations. Cannot do word problems.

		problems.	
Geometry	Can visualize in three dimensions. Can scale shapes. Effective at applying geometric methods to specific problems.	Can visualize above two dimensions only for simple shapes. Unable to scale shapes. Competent at using angular measurements in multiple dimensions.	Confusion about differences between volume and area. Difficulty with angular measurements.
Statistics and probability	Can interpret data in other (“non-normal”) distributions. Understands the validity and limitations of sampling methods including the chance of false positives. Familiarity with probabilistic reasoning.	Can interpret data in a normal distribution, including concepts such as mean, mode, median, and standard deviation. Understands basic ideas of sampling methods and error analysis.	Understands simple average, but does not distinguish mean, mode, median. Is unfamiliar with standard deviation. No clear understanding of sampling methods and error analysis.
Tables and graphs	Can understand data presented in tabular or graphical form, and recognize trends in data. Understands the validity of extrapolation. Can develop sketch graphs.	Can extract relevant data from tables or graphs, and interpolate, but without ability to see the overall picture. Recognize importance of scales, labels, and error bars.	Can retrieve data from tables. Fails to recognize importance of scales, labels, and error bars.

Approximation / estimation	Can effectively perform meaningful and novel estimates and approximations.	Can incorporate estimated data to estimate expected results.	Over reliance on calculators. Views all answers as precise.  Unable to distinguish between accuracy and precision.
Mathematical/quantitative models	Can analyze a real world example sufficiently to conceptualize a simulation of the system, which is complex enough to give meaningful results, but simple enough to be understandable.	Can simplify complex models to obtain approximate results and understand the limitations imposed by that approximation.	Can recognize and appreciate meaningful use of models to understand the world at large.