

QUANTITATIVE LITERACY RUBRIC

DEFINITION

Quantitative Literacy (QL) is the ability to perform accurate calculations, interpret quantitative information, apply and analyze relevant numerical data, and use results to support conclusions. Degree graduates will calculate, interpret, and use numerical and quantitative information in a variety of settings.

FRAMING LANGUAGE

This rubric has been designed for the evaluation of work that addresses quantitative reasoning in a substantive way. QL is not just computation, not just the citing of someone else's data or listing formulas. QL is a habit of mind, a way of thinking about the world that relies on data and functions and on mathematical analysis of data to make connections and draw conclusions. Teaching QL requires us to design assignments that address authentic, quantitative problems. Such assignments may call for the traditional written paper, but we can imagine other alternatives: a multi-part application problem drawn from a real-world scenario, a proof or derivation using operations or functions and mathematical interpretation to support the conclusion, or a PowerPoint presentation, perhaps. In any case, a successful demonstration of QL will place the mathematical work in the context of a full and robust discussion of the underlying issues addressed by the assignment.

GLOSSARY

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

- **Interpretation:** Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, and words).
- **Representation:** Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, and words).
- **Application/Analysis:** Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data and/or functions, while recognizing the limits of this analysis.
- **Assumptions:** Ability to make and evaluate important assumptions in estimation, modeling, and data analysis.
- **Communication:** Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized).

QUANTITATIVE LITERACY VALUE RUBRIC

For more information, contact value@aacu.org.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Interpretation	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. <i>For example, accurately explains the trend shown in a graph using words, functions, etc., and uses the descriptions to make reasonable predictions.</i>	Provides accurate explanations of information presented in mathematical forms. <i>For instance, accurately explains the trend shown in a graph using words, functions, etc.</i>	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. <i>For instance, accurately explains the trend shown in a graph, but may miscalculate the slope of the trend line.</i>	Attempts to explain information presented in mathematical forms but draws incorrect conclusions about what the information means. <i>For example, attempts to explain the trend shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</i>
Representation	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.
Calculation	Calculations and mathematical operations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.).	Calculations and mathematical operations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations and mathematical operations attempted are either partially successful or represent only a portion of the calculations or operations required to comprehensively solve the problem.	Calculations and mathematical operations are attempted but are both unsuccessful and are not comprehensive.
Application/Analysis	Uses quantitative analysis as the basis for deep and thoughtful and logical judgments, drawing insightful, carefully qualified conclusions from this work.	Uses quantitative analysis as the basis for logical judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses quantitative analysis as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses quantitative analysis as the basis for tentative, basic judgments, although hesitant or uncertain about drawing conclusions from this work.
Assumptions	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.
Communication	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data or functions may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent but does not provide adequate explicit numerical support. <i>(May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities or operations).</i>