



gtPATHWAYS COMPETENCY: QUANTITATIVE LITERACY

Required in gtPathways Categories: MA1, MA2, MA3, MA4, SC1 & SC2

Criteria for Quantitative Literacy

Competency in quantitative literacy represents a student's ability to use data and the mathematical analysis of data to make connections and draw conclusions. Students with strong quantitative literacy skills understand and can create sophisticated arguments supported by quantitative evidence and can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc.)

Student Learning Outcomes (students should be able to...):

Interpret Information

- Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).

Represent Information

- Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

Perform Calculations

- Solve problems or equations at the appropriate course level.
- Use mathematical notation in all aspects of the solution of a typical problem at the appropriate course level.
- Solve a variety of different problem types that involve a multi-step solution and be able to consider the validity of the results.

Address Assumptions

- Describe and support assumptions in estimation, modeling, and data analysis, used as appropriate for the course.





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Apply and Analyze Information

- Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level.
- Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.
- Make judgments based on quantitative data using analysis appropriate to the course level.
- Critically analyze data based on course level.

Communicate about Mathematical Forms

- Expresses quantitative information symbolically, graphically, and in written language (may also include oral communication).



QUANTITATIVE LITERACY RUBRIC

*This rubric is meant to be an **optional** course design and assessment tool. Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet level one performance criteria minimum.*

	4	3	2	1
Interpret Information	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information.	Provides accurate explanations of information presented in mathematical forms.	Provides explanations of information presented in mathematical forms, but makes errors within the explanation or inappropriate inferences based on the information.	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.
Represent Information	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 <i>or</i> accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate <i>or</i> inaccurate.
Perform Calculations	Calculations attempted are all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are successful but only represent a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are unsuccessful and may not be comprehensive.



	4	3	2	1
Apply and Analyze Information	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for unskilled judgments, is hesitant or uncertain about drawing conclusions from this work.
Make Assumptions	Specifically 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.	Specifically describes assumptions and provides compelling rationale for why assumptions are appropriate.	Specifically describes assumptions but attempts made to address rationale are inappropriate or ineffective.	Specifically describes assumptions but lacks rationale.
Communicate about Mathematical Forms	Uses quantitative information in connection with a written argument or description of purpose of the work, presents it in an effective format, and explains with consistently high quality (may also include an oral argument).	Uses quantitative information in connection with a written argument or description of purpose of the work, though data may be presented in a less than complete format or some parts of the explanation may be disjointed.	Presents a written argument but does not provide adequate quantitative information to support or connect the argument and purpose of work.	Uses quantitative information, but does not articulate a written argument that connects to the purpose of the work and the information.

This rubric was adapted from the Association of American Colleges and Universities (AAC&U) VALUE rubrics and is also aligned with the Interstate Passport Initiative Learning Outcomes. The original VALUE rubrics may be accessed at <http://www.aacu.org/value-rubrics>. The Interstate Passport Initiative Learning Outcomes can be accessed at <http://www.wiche.edu/passport/learningOutcomesCriteria>.