

What is Quantitative Reasoning?

MichMATYC Workshop on QR Courses, February 2015

Kentucky Gen Ed standards

Quantitative Reasoning

<http://www.maa.org/programs/faculty-and-departments/curriculum-department-guidelines-recommendations/quantitative-literacy/quantitative-reasoning-college-graduates#Part2>

Quantitative Reasoning (QR)

1. Interpret information presented in mathematical and/or statistical forms. (LEAP B)*

2. Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically. (LEAP A, B and C)*

3. Determine when computations are needed and to execute the appropriate computations. (LEAP B)*

4. Apply an appropriate model to the problem to be solved (LEAP A, C and D)*

5. Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis. (LEAP B, C and D)*

LEAP (Liberal Education and America's Promise): <http://www.aacu.org/leap/essential-learning-outcomes>

LEAP 'rubric' on QL available at <http://mwcc.edu/academic/files/2013/02/QuantitativeLiteracy-LEAP-Rubric.pdf>

MAA quantitative literacy

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In short, every college graduate should be able to apply simple mathematical methods to the solution of real-world problems. A quantitatively literate college graduate should be able to:

1. Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.
2. Represent mathematical information symbolically, visually, numerically, and verbally.
3. Use arithmetical, algebraic, geometric and statistical methods to solve problems.
4. Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.
5. Recognize that mathematical and statistical methods have limits.

Indiana Math Task Force (2014)

http://www.in.gov/icc/files/Math_Taskforce_DOE_QR_handout.pdf

Quantitative Reasoning Defined

For the Core 40, Academic Honors (AHD), and Technical Honors (THD) diplomas, students must take a mathematics course or a quantitative reasoning course each year they are enrolled in high school. For the General Diploma, students must earn two credits in a mathematics course or a quantitative reasoning course during their junior or senior year.

Quantitative Reasoning Defined

Quantitative reasoning is knowledge of and confidence with basic mathematical/analytical concepts and operations required for problem solving, decision making, economic productivity and real world applications. Quantitative reasoning will prepare students for an increasingly information-based society in which the ability to use and critically evaluate information, especially numerical information, is central to the role requirements of an informed citizen. Students should acquire the skills necessary to make rational decisions based on real data. Students will be able to report their conclusions in a precise and accurate manner using the language, tools, and symbolism of mathematics.

Quantitative reasoning includes

- mathematics, statistics, algorithms, and formal symbolic logic
- the process of making reasonable estimation, forming conclusion(s), judgment or inferences from quantitative information
- the recognition and construction of valid mathematical models that represent quantitative information
- the analysis and manipulation of models that represent quantitative information
- the drawing of conclusions, prediction or inferences on the basis of this analysis
- the assessment of the reasonableness of conclusions drawn from the data