Rubric for Quantitative and Scientific Reasoning

	Analysis*	Calculations*	Visual Representations of Data and Information	Scientific Methodology
4 (Advanced)	• Demonstrates advanced reasoning based on quantifiable information; judgments and conclusions are exceptionally insightful	• Accurately completes calculations for the assignment and presents results clearly and concisely • Chooses appropriate formulas or symbolic models to solve problems and justify choices	• Produces highly effective visual representations of data (e.g. tables) or concepts (e.g. graphs)	• Skillfully and precisely engages in the 6 steps needed in undertaking a science-based approach to gathering and interpreting evidence 1. Identify problem 2. Formulate a hypothesis 3. Design a project to test hypothesis 4. Collect data 5. Analyze data 6. Draw conclusions based on data • Exhibits highly accurate and exhaustive analysis of data • Produces work that contributes to the field
3 (Competent)	Demonstrates competent reasoning based on quantifiable information; judgments and conclusions are adequate and reasonable	Calculations are completed and largely successful • Chooses appropriate formulas or symbolic models to solve problems and justify choices	Produces competent visual representations of data	Engages in all 6 steps needed in undertaking a science-based approach to gathering and interpreting data Produces an analysis of data • Produces work that meets the requirements of the assignments/course
2 (Emerging)	Demonstrates emerging reasoning based on quantifiable information as exhibited by difficulty in formulating judgments or drawing conclusions	Calculations contain multiple errors • May not choose the most appropriate or effective formula • May exhibit some problems justifying choices	Visual representations may reflect minor flaws or inaccuracies	Engages in the 6 steps but may exhibit problems with a few • Analysis of data may reflect minor inaccuracies of observation • Work may not fully satisfy the requirements of the assignment/course
1 (Beginning)	Demonstrates beginning reasoning based on quantifiable information as exhibited by difficulty understanding what constitutes quantifiable information, inability to formulate reasonable judgments and/or drawing reasonable conclusions.	Calculations may be unsuccessful or incomplete • Does not appear to understand the parameters of the appropriate formula • Is unable to select the right formula for the problem (decision-making unclear)	The method for visually presenting information or concepts is highly inaccurate or imprecise	Exhibits problems in many if not most of the steps required for the scientific process • Analysis of data is incomplete, inaccurate, or absent • Work does not satisfy the requirements of the assignment/course

* These columns are used to simultaneously assess critical thinking