Transition to Quantitative Literacy Unit Rubrics

Constructing Our World

Standard	4 - Mastery	3 - Proficient	2 - Basic	1- Below Basic	0 - No Evidence
QL-A1-A Use variables to accurately represent quantities or attributes in a variety of authentic tasks.	A: Analyze authentic tasks to interpret variables and quantities.	A: Create an expression from any authentic task. Including naming the variable	A: Create an expression from an authentic task- linear. Including naming the variable. A: Match correct expression to given task.	A: Identify parts of an expression. ie term, coefficient, variable. A: Given an authentic task student can identify the variable.	A: Not yet able to apply vocabulary to identify parts of an expression.
QL-A1.B Predict and then confirm the effect that changes in variable values have in an algebraic relationship.	B: Predict and confirm, with support, of changes for a variable	B: Mathematically confirm predictions to authentic task changes.	B: Predict what changes in an authentic task would do to an expression	B: Can complete one of the following: either predict or confirm what changes in an authentic task would do to an expression.	B: Not yet able to predict or confirm what changes in an authentic task would do to an expression.
QL-A1-D Write expressions and/or rewrite expressions in equivalent forms to solve problems.	D: Create multiple equivalent expressions including radical. D: Interpret and communicate how expressions are equivalent given an authentic task.	D: Create multiple equivalent expressions - linear, rational. D: Identify and create equivalent expressions - linear, quadratic, rational, and radical. D: Create an expression from an authentic task - rational, radical, quadratic, and linear	D: Identify and create only linear equivalent expressions.	D: Identify only linear equivalent expressions given a set of expression.	D:Not yet able to identify equivalent expressions.
QL-A2-A Perform arithmetic operations (addition, subtraction, multiplication) on polynomials in authentic tasks. (2nd degree polynomial with rational roots; 3rd &4th degree polynomial with integer and rational roots)	A: Perform addition, subtraction, and multiplication of 4th degree polynomials. A: Set-up and perform addition, subtraction, and multiplication with 3rd degree polynomials from an authentic task.	A: Perform addition, subtraction, and multiplication of 3rd degree polynomials. A: Set-up and perform addition, subtraction, and multiplication with 1st and 2nd degree polynomials from an authentic task with no errors.	A: Perform addition, subtraction, and multiplication of 2nd degree polynomials. A: Set-up and perform addition, subtraction, and multiplication with 1st and 2nd degree polynomials from an authentic task; may have minor errors	A: Perform addition, subtraction, and multiplication of 1st degree polynomials. A: Identify which operation would need to be performed given an authentic task.	A: Not yet able to identify like terms, combine like terms, and apply addition and multiplication properties. A: Not yet able to identify which operation would need to be performed given an authentic task.
QL-A2-B Demonstrate the relationship between zeros and factors of polynomials.	B: Factor and solve 3rd and 4th degree polynomials with Integer and Rational roots.	B: Factor and solve 2nd degree polynomials with Rational roots. B: Find and interpret meanings of zeros from 1st and 2nd degree authentic tasks.	B: Factor and solve 2nd degree polynomials with Integer roots. B: Interpret meaning of zeros from a 1st and 2nd degree authentic task.	B: Find zeros from a graph or visual representation. B: Determine that a zero is needed to be found for a task	B: Not yet able to find zeros from a graph or visual representation. B: Not yet able to determine that a zero is needed to be found for a task.

Transition to STEM Unit Rubrics

QL-N1-A Demonstrate operation sense and the effects of common operations on numbers in words and symbols. QL-N1-B Apply mathematical properties in numeric and algebraic contexts.	A-C. Use mathematical properties and statistical summaries to justify more advanced concepts.	A-C. Explain mathematical properties and statistical summaries.	A-C. Use mathematical properties and statistical summaries.	A-C. Identify mathematical properties and statistical summaries.	A-C. Not yet able to use or identify mathematical properties or statistical summaries.
QL-N1-E Demonstrate competency in the use of magnitude in the contexts of place values, fractions, and numbers written in scientific notation. QL-N1-F Demonstrate measurement sense that includes predicting, estimating, and then solving problems using appropriate units.	E-F. Explain why and how units are affected by operations.	E-F. Choose, convert and apply appropriate units and forms of numbers to solve problems in real world context.	E-F. Convert units of measurement or between forms of numbers (scientific notation, decimal form, etc.) while solving.	E-F. Choose appropriate units of measurement and form of number (scientific notation, decimal form, etc) for a given situation.	E-F. Not yet able to take units into account when solving.
QL-N2-A Perform arithmetic operations on whole numbers, integers, fractions, and decimals including basic operations without a calculator.	A. Create and solve a real- world task that requires conversion and operations with decimals and fractions without a calculator.	A. Choose and convert between fractions and decimals to represent and solve for real-world quantities and justify their choice without a calculator.	A. Fluently perform multiple operations with fractions, decimals, and integers without use of calculator.	A. Perform simple operations with decimals, fractions, and integers without use of a calculator.	A. Not yet able to perform operations with decimals and fractions, or positive and negative integers without a calculator.
QL-N3.A Use estimation skills.	A. Justify choice of statistical methods used to create estimates.	A. Use statistical measures of estimation, including, but not limited to normal distribution, confidence intervals, and linear regression.	A. Use statistical measures of estimation, including, but not limited to measures of central tendency and linear regression.	A. Use statistical measures of central tendency to estimate	A. Not yet able to use estimation skills accurately.
QL-N3.B State convincing evidence to justify estimates.	B. Compare estimations to find the most accurate and/or most reasonable solution.	B. Determine if solution is appropriate in context of the problem and justify.	B. Determine if solution is reasonable in context of the problem.	B. Eliminate unreasonable solutions and estimates.	B. Not yet able to analyze solutions for reasonableness.

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QL-FM1-A Use variables in a variety of mathematical contexts to represent quantities or attributes	A. Make general statements about translating mathematical sentences or situations into equations Make general statements about independent and dependent variables.	A. Translate a given mathematical sentence or situation into an equation with appropriate numbers and variables Identify the independent and dependent variable in authentic tasks	A. Translate a given mathematical sentence into an equation using appropriate numbers and variables Identify the independent and dependent variable.	A. Identifies that a variable is necessary Translates given mathematical sentences into equations accurately 50% of the time.	A. Not yet able to identify when a variable should be used.
QL-FM1.B Predict and then confirm the effect that changes in variable values have in an algebraic relationship	B. Analyze and correct others' predictions including what may have led them to that prediction.	B. Make a correct prediction, confirm the answer mathematically, and can interpret that answer in an authentic task.	B. Make a correct prediction about the algebraic relationship and confirm the answer mathematically.	B. Not yet able to make a correct prediction about the algebraic relationship	B. Not yet able to make a prediction about the algebraic relationship.
QL-FM1-C Understand the concept of a function.	C. Create examples of functions and non-functions in a variety of representations.	C. Identifies a function in two or more representations (graph, table, equation) and can explain why it is or is not a function in the context of the situation.	C. Identifies a function in one or more representations (graph, table, equation) and can explain why it is or is not a function.	C. Identifies a function in one of the representations (graph, table, equation) not able to explain why it is a function.	C. Not yet able to identify functions.
QL-FM1.D Interpret functions. QL-FM1.G Identify important characteristics of functions in various representations.	D/G. Generalize key features of functions and how they are modelled in various representations (Example: what a y-intercept is on a graph, equation, table, or in a situation).	D/G. Identify key features given a function; interpret key features, model the function in another representation, and solve authentic tasks involving the function.	D/G. Identify key features given a function; interpret those features or can model the function in another representation.	D/G. Identify key features given a function.	D/G. Not yet able to identify any key features of a given function.
QL-FM1.E Analyze functions using different representations (descriptions, tables, graphs, and equations). QL-FM1-F Represent common types of functions using words, algebraic symbols, graphs, and tables.	E/F. Model and analyze characteristics of rational or radical functions.	E/F. Model and analyze characteristics of linear, quadratic, and exponential functions in a variety of authentic tasks.	E/F. Model and analyze characteristics of linear and quadratic functions	E/F. Model and analyze characteristics of only linear functions.	E/F. Not yet able to model or analyze functions in any representation.
QL-FM2-A Translate problems from a variety of contexts into mathematical representations and vice versa.	A. Choose and efficient model to analyze problems in a variety of context.	A. Translate between tables, graphs, equations, and written descriptions in a variety of authentic tasks.	A. Translate between visual representations (tables/graphs), equations, and sometimes written descriptions.	A. Translate between tables and graphs (between two visual representations) and sometimes equation.	A. Not yet able to translate problems into any other form of representation.

QL-FM2.F Apply geometric concepts in modeling situations.	F. Identify and model a variety of geometric concepts and justify their properties and applications.	F. Identify and apply multiple geometric relationships needed to solve an authentic task.	F. Identify multiple geometric relationships needed to solve an authentic task.	F. Identify a geometric relationship and able to apply it given the task and the geometric application needed.	F. Identify a geometric relationship but unable to apply it
QL-FM3.B Use reasoning that supports that abstract mathematical models used to characterize real-world scenarios or physical relationships are not always exact and may be subject to error from many sources. (how a mathematical model (or when) a mathematical model does not represent a real world situation physics lab.)	B. Use error analysis to identify potential error sources influencing data, models, and/or results. Explain the effect the error/variable has on the data, model, or results.	B. Use reasoning that supports that abstract mathematical models used to characterize real-world scenarios or physical relationships are not always exact and may be subject to error from many sources.	B. Use abstract mathematical models to characterize real world scenarios or physical relationships with guidance and support.	B. Relate models to real world concepts.	B. Not yet able to relate models to real world concepts.