Interactive Mathematics Program Curriculum Framework

School:__The Delaware MET_________ **Curricular Tool: _IMP_________** **Grade or Course: _Year 2 (grade 10)**

Standards Alignment	Unit Concepts / Big Ideas from *IMP*	Essential Questions	Assessment
Unit One: Do Bees Build it Best? **Timeline: 20 days**			
Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **CC.N-Q.3** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. **CC.A-REI.2** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. **CC.A-REI.4b** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* **CC.F-IF.5** Prove theorems about triangles using similarity transformations. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean theorem proved using triangle similarity.* **CC.G-SRT.4** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. **CC.G-SRT.8** Prove the Laws of Sines and Cosines and use them to solve problems. **CC.G-SRT.10**	The regular form of a honeycomb is striking. Viewed end on, honeycomb cells resemble the hexagonal tiles on a bathroom floor. But a honeycomb is a three-dimensional object, a collection of right hexagonal prisms. Why do bees build their honeycombs this way? Concepts of measurement—especially area, surface area, and volume—are the mathematical focus of this unit. The main concepts and skills that students will encounter and practice during the unit are summarized by category here. ***Area*** • Understanding the role of units in measuring area • Establishing standard units for area, especially those based on units of length • Recognizing that a figure's perimeter alone does not determine its area • Discovering formulas for the areas of rectangles, triangles, parallelograms, and trapezoids • Establishing that a square has the greatest area of all rectangles with a fixed perimeter • Developing a formula for the area of a regular polygon with a given perimeter in terms of the number of sides • Discovering that for a fixed perimeter, the more sides a regular polygon has, the greater its area • Discovering that the ratio of the areas of similar figures is equal to the square of the ratio of their corresponding linear dimensions	Can students measure area using both standard and nonstandard units? Can students use several methods for finding areas of polygons, including development of formulas for area of triangles, rectangles, parallelograms, trapezoids, and regular polygons? Can students find surface area and volume for three-dimensional solids, including prisms and cylinders? Can students apply the Pythagorean theorem? Can students prove the Pythagorean theorem? Can students maximize area for a given perimeter? Do students understand the relationship between the areas and volumes of similar figures? Can students create successful tessellations? Can students apply right triangle trigonometry to area and perimeter problems?	All assessments are listed at the end of the curriculum map.

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Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). **CC.G-SRT.11** Give an informal argument for the formulas for the volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments*. **CC.G-GMD.1** *Given an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.* **CC.G-GMD.2** *– unit supplement to be developed* Use volume formulas for cylinders, pyramids, cones and spheres to solve problems. **CC.G-GMD.3** Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. **CC.G-GMD.4** Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy constraints or minimize cost; working with typographic grid systems based on ratios). **CC.G-MG.3**	***The Pythagorean Theorem*** • Discovering the Pythagorean theorem by comparing the areas of the squares constructed on the sides of a right triangle • Proving the Pythagorean theorem using an area argument • Applying the Pythagorean theorem in a variety of situations ***Surface Area and Volume*** • Understanding the role of units in measuring surface area and volume • Establishing standard units for surface area and volume, especially those based on a unit of length • Recognizing that a solid figure's surface area alone does not determine its volume • Developing principles relating the volume and surface area of a prism to the area and perimeter of its base • Discovering that the ratio of the surface areas of similar solids is equal to the square of the ratio of their corresponding linear dimensions, and that the ratio of the volumes of similar solids is equal to the cube of the ratio of their corresponding linear dimensions ***Trigonometry*** • Reviewing right-triangle trigonometry • Finding the ranges of the basic trigonometric functions (for acute angles) • Using the terminology and notation of inverse trigonometric functions ***Miscellaneous*** • Reviewing similarity • Reviewing the triangle inequality • Reviewing the angle sum property for triangles • Strengthening two- and three-dimensional spatial visualization skills • Examining the concept of tessellation and		

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Standards Alignment	Unit Concepts / Big Ideas from *IMP*	Essential Questions	Assessment
	discovering which regular polygons tessellate • Developing some properties of square-root radicals • Developing the general concept of an inverse function		
Unit Two: Cookies **Timeline: 18 days**			
Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* **CC.A-CED.1** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **CC.A-CED.2** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* **CC.A-CED.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **CC.A-REI.3** *Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.* ***CC.A-REI.5*** *– supplementary lesson is being developed by the publisher* Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **CC.A-REI.6**	The central mathematical focus of *Cookies* is the formulation and solution of problems of optimization, or linear programming problems. In problems of this type, a linear function is to be optimized and a set of linear conditions constrains the possible solutions. Linearity is an important feature of these two-variable problems, in two ways: • The constraints are linear, so the feasible region is a polygon and its vertices can be found by solving pairs of linear equations. • The expression to be maximized or minimized is linear, so the points that give this expression a particular value lie on a straight line, and investigating a series of values produces a family of parallel lines. The linear programming problems that students encounter in this unit involve only two variables and a limited number of constraints. Their solutions are therefore easier to understand graphically, and the algebra needed to find their exact solutions is manageable. The main concepts and skills that students will encounter and practice during the unit are summarized here. ***Using Variables to Represent Problems*** • Expressing and interpreting constraints using inequalities • Expressing problem situations using systems of linear equations ***Working with Variables, Equations, and***	Can students express real-world situations in terms of equations and inequalities? Can students apply the distributive property? Can students use several methods for solving systems of linear equations in two variables? Can students define and recognize dependent, inconsistent, and independent pairs of linear equations? Can students solve non-routine equations using graphing calculators? Can students write and graph linear inequalities in two variables? Can students use principles of linear programming for two variables? Can students create linear programming problems with two variables?	All assessments are listed at the end of the curriculum map.

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Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$. **CC.A-REI.7** Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding halfplanes. **CC.A-REI.12** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity*. **CC.F-IF.4** Graph linear and quadratic functions and show intercepts, maxima, and minima. **CC.F-IF.7a**	***Inequalities*** • Finding equivalent expressions and inequalities • Solving linear equations for one variable in terms of another • Developing and using a method for solving systems of two linear equations in two unknowns • Recognizing inconsistent systems and dependent systems ***Graphing*** • Graphing linear inequalities and systems of linear inequalities • Finding the equation of a straight line and the inequality for half plane • Using graphing calculators to draw feasible regions • Relating the intersection point of graphed lines to the common solution of the related equations • Using graphing calculators to estimate coordinates of points of intersection ***Reasoning Based on Graphs*** • Recognizing that setting a linear expression equal to a series of constants produces a family of parallel lines • Finding the maximum or minimum of a linear equation over a region • Examining how the parameters in a problem affect the solution • Developing methods of solving linear programming problems with two variables ***Creating Word Problems*** • Creating problems that can be solved using two equations in two unknowns • Creating problems that can be solved by linear programming methods		

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Unit Three: Is There Really a Difference? **Timeline: 21 days**			
Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal and conditional relative frequencies). Recognize possible associations and trends in the data. **CC.S-ID.5** Distinguish between correlation and causation. **CC.S-ID.9** Understand that statistics is a process for making inferences about population parameters based on a random sample from that population. **CC.S-IC.1** Decide if a specified model is consistent with results from a given data-generating process, e.g. using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?* **CC.S-IC.2** Recognize the purposes of and differences among sample surveys, experiments and observational studies; explain how randomization relates to each. **CC.S-IC.3** Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. **CC.S-IC.4** Use data from a randomized experiment to compare two treatments; justify significant differences between parameters through the use of simulation models for random assignment. **CC.S-IC.5** Evaluate reports based on data. **CC.S-IC.6** Construct and interpret two-way frequency tables of data when two categories are associated with each	The unit explores two categories of problems: • Problems that compare a single population to a theoretical model (the theoretical-model case) • Problems that compare two distinct populations (the two-population case) Students learn that statisticians often presume that a “neutral” hypothesis, called a null hypothesis, holds unless there is clear evidence to the contrary. In the context of the two categories of problems, the null hypothesis is that the single population *does* fit the model or that the two populations being studied *are* the same. Students learn that to evaluate the null hypothesis, they must examine whether the observed data could reasonably have occurred under that null hypothesis. In the course of studying such questions, students will • work with double-bar graphs to explore data • form hypotheses and corresponding null hypotheses • develop an intuitive sense for evaluating differences between sets of data • learn ways of organizing and presenting data • learn about designing and carrying out statistical studies This unit builds on students’ prior experience with statistical ideas in the Year 1 unit *The Pit and the Pendulum.* In that unit, students worked with the normal distribution and used the standard deviation statistic as their primary tool. In this unit, students use the chi-square statistic, or x^2 statistic. In the main activities of the unit, students use the x^2 statistic only in the case of one degree of freedom. Supplemental activities explore more general use of the statistic.	Can students draw inferences from statistical data? Can students design, conduct, and interpret statistical experiments? Can students make and test statistical hypotheses? Can students formulate null hypotheses and understand its role in statistical reasoning? Can students use the χ^2 statistic? Do students understand that tests of statistical significance do not lead to definitive conclusions? Can students solve problems that involve conditional probability?	All assessments are listed at the end of the curriculum map.

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object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science and English. Estimate the probability that a randomly selected student from your class will favor science given that the student is a boy. Do the same for other subjects and compare the results.* **CC.S-CP.4** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of being unemployed if you are female with the chance of being female if you are unemployed.* **CC.S-CP.5** Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?* **CC.S-MD.4**	Although the unit makes intensive use of the x^2 statistic, the real emphasis is on broader statistical ideas, such as the null hypothesis, sampling fluctuation, and hypothesis testing. The main concepts and skills that students will encounter and practice during the course of this unit are summarized by category here. ***Setting Up Statistical Investigations*** • Distinguishing between data snooping and hypothesis testing • Describing the characteristics of a good sample • Making null hypotheses • Using proportional reasoning to analyze the consequences of a null hypothesis • Designing and conducting statistical experiments ***Interpreting Data*** • Making hypotheses about larger populations by analyzing sample data • Constructing and drawing inferences from charts, tables, and graphs, including frequency bar graphs and double-bar graphs • Determining whether to accept or reject a null hypothesis • Understanding the consequences of rejecting a null hypothesis • Interpreting statistical experiments and communicating the outcomes ***The x^2 Statistic*** • Developing intuition about the meaning of the x^2 statistic • Using simulations to estimate the x^2 distribution • Interpreting the x^2 distribution curve as a probability table • Calculating and interpreting the x^2 statistic in order to compare data from real-world situations to theoretical models		

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	• Calculating and interpreting the x^2 statistic in order to compare two populations • Using the x^2 statistic to make decisions • Understanding some limitations in applying the x^2 statistic ***Related Concepts*** • Working with conditional probabilities • Using simulations to develop intuition and to obtain data about sampling fluctuation • Developing intuition about when differences in samples indicate that the larger populations are likely to be different • Understanding why neither numeric difference nor percentage difference is an adequate tool for measuring the "weirdness" of data • Reviewing the normal distribution and standard deviation and their applications to decision making		
Unit Four: Fireworks **Timeline: 13 days**			
Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.* **CC.A-SSE.2** Factor a quadratic expression to reveal the zeros of the function it defines. **CC.A-SSE.3a** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. **CC.A-SSE.3b** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. **CC.A-APR.1** *Know and apply the Remainder Theorem: For a*	*Fireworks* focuses on the use of quadratic functions to represent a variety of real-world situations and on the development of algebraic skills for working with those functions. Experiences with graphs play an important role in understanding the behavior of quadratic functions. The main concepts and skills students will encounter and practice during the unit are summarized here. ***Mathematical Modeling*** • Expressing real-world situations in terms of functions and equations • Applying mathematical tools to models of real-world problems • Interpreting mathematical results in terms of real-world situations	Can students solve quadratic equations by factoring? Can students relate the number of roots of a quadratic equation to the graph of the associated quadratic function? Can students use the method of completing the square to analyze the graphs of quadratic equations and to solve quadratic equations?	All assessments are listed at the end of the curriculum map.

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polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x). **CC.A-APR.2** *- unit supplement to be developed* Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. **CC.A-APR.3** Solve quadratic equations in one variable. **CC.A-REI.4** Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. **CC.A-REI.4a** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. **CC.A-REI.4b** Graph linear and quadratic functions and show intercepts, maxima, and minima. **CC.F-IF.7a** Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. **CC.F-IF.7c** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **CC.F-IF.8** Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. **CC.F-IF.8a**	***Graphs of Quadratic Functions*** • Understanding the roles of the vertex and x-intercept in the graphs of quadratic functions • Recognizing the significance of the sign of the x^2 term in determining the orientation of the graph of a quadratic function • Using graphs to understand and solve problems involving quadratic functions ***Working with Algebraic Expressions*** • Using an area model to understand multiplication of binomials, factoring of quadratic expressions, and completing the square of quadratic expressions • Transforming quadratic expressions into vertex form • Simplifying expressions involving parentheses • Identifying certain quadratic expressions as perfect squares ***Solving Quadratic Equations*** • Interpreting quadratic equations in terms of graphs and vice versa • Estimating x-intercepts using a graph • Finding roots of an equation using the vertex form of the corresponding function • Using the zero product rule of multiplication to solve equations by factoring		

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Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* **CC.F-IF.9** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. **CC.F-BF.3**			
Unit Five: All About Alice **Timeline: 12 days**			
Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.* **CC.N-RN.1** Rewrite expressions involving radicals and rational exponents using the properties of exponents. **CC.N-RN.2** *Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.* ***CC.N-RN.3*** *– supplementary lesson is being developed by the publisher* Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate*	Unlike most other IMP units, All About Alice has no central problem to solve. Instead, there is a general context to the unit. In particular, the Alice story provides a metaphor for understanding exponents. When Alice eats an ounce of cake, her height is multiplied by a particular whole-number amount; when she drinks an ounce of beverage, her height is multiplied by a particular fractional amount. Using this metaphor, students reason about exponential growth and decay. Students use several approaches to extend exponentiation beyond positive integers: a contextual situation, algebraic laws, graphs, and number patterns. They then apply principles of exponents to study logarithms and scientific notation. The main concepts and skills students will encounter and practice during the course of this unit are summarized by category here.	Can students use exponential expressions, including zero, negative, and fractional exponents? Can students apply the laws of exponents? Can students use scientific notation? Can students use the concept of order of magnitude in estimation?	All assessments are listed at the end of the curriculum map.

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mortgage payments. **CC.A-SSE.4** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. **CC.F-IF.7e** Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as* $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, *and classify them as representing exponential growth or decay.* **CC.F-IF.8b** Find inverse functions. **CC.F-BF.4** Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. *For example,* $f(x) = 2x^3$ *for* $x > 0$ *or* $f(x) = (x+1)/(x-1)$ *for* $x \neq 1$. **CC.F-BF.4a** Verify by composition that one function is the inverse of another. **CC.F-BF.4b** Read values of an inverse function from a graph or a table, given that the function has an inverse. **CC.F-BF.4c** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. **CC.F-BF.5** Distinguish between situations that can be modeled with linear functions and with exponential functions. **CC.F-LE.1** Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. **CC.F-LE.1a**	***Extending the Operation of Exponentiation*** • Defining the operation for an exponent of zero • Defining the operation for negative integer exponents • Defining the operation for fractional exponents ***Laws of Exponents*** • Developing the additive law of exponents • Developing the law of repeated exponentiation ***Graphing*** • Describing the graphs of exponential functions • Comparing graphs of exponential functions for different bases • Describing the graphs of logarithmic functions • Comparing graphs of logarithmic functions for different bases ***Logarithms*** • Understanding the meaning of logarithms • Making connections between exponential and logarithmic equations ***Scientific Notation*** • Converting numbers from ordinary notation to scientific notation, and vice versa • Developing principles for doing computations using scientific notation • Using the concept of order of magnitude in estimation		

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Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. **CC.F-LE.1c** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. **CC.F-LE.3**			

Assessment Opportunities in this Unit:

End-of-Unit Assessments:
Each unit concludes with in-class and take-home assessments. The in-class assessment is intentionally short so that time pressures will not affect student performance. Students may use graphing calculators and their notes from previous work when they take the assessments.

Ongoing Assessment:
Assessment is a component in providing the best possible ongoing instructional program for students. Ongoing assessment includes the daily work of determining how well students understand key ideas and what level of achievement they have attained in acquiring key skills.

Students' written and oral work provides many opportunities for teachers to gather this information. Here are some recommendations of written assignments and oral presentations to monitor especially carefully that will offer insight into student progress.

- How Many Can You Find?: This assignment will inform you about how well students have understood the basics about the meaning of area.
- That's All There Is!: This activity will tell you how comfortable students are with a more open-ended approach to area.
- More Gallery Measurements: This activity will provide information on students' grasp of the fundamentals of right-triangle trigonometry.
- Any Two Sides Work, Make the Lines Count, and The Power of Pythagoras: These assignments will tell you about students' comfort with using the Pythagorean theorem.
- Leslie's Fertile Flowers: In this activity, students need to combine ideas about area with use of the Pythagorean theorem, so it will give you a sense of their facility with these concepts.
- More Fencing, Bigger Corrals: This activity, which involves how changes in linear dimensions affect area, will help you decide how much work students need on this topic.
- Not a Sound: This assignment will give you feedback on students' grasp of the concept of surface area.
- Inequality Stories, Part I: This assignment will give you information about students' understanding of how real-life contexts can be expressed in algebraic terms using inequalities.
- Profitable Pictures: This activity will tell you how well students understand how profit lines can be used to determine an optimal value.
- Changing What You Eat: In this assignment, students will demonstrate their understanding of how changing specific parameters in a problem affects the solution.
- Get the Point: This investigation will give you insight into students' abilities to think about systems of linear equations in flexible ways.
- A Reflection on Money: This assignment will give you information about students' comfort levels with solving systems of linear equations.
- "How Many of Each Kind?" Revisited: This activity will tell you how well students have synthesized the ideas of the unit.

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- Changing the Difference, Part I: This work will give you information on students' sense of how probabilities behave with large samples.
- Loaded or Not?: This activity will tell you how well students can interpret experimental data.
- Decisions with Deviation: This assignment will provide information about students' understanding of how to use the normal distribution.
- Measuring Weirdness with χ^2 : This activity will give you information about students' understanding of how to calculate and use the χ^2 statistic.
- Late in the Day: This assignment will give you feedback on how well students can set up and analyze a situation using the χ^2 statistic.
- "Two Different Differences" Revisited: This activity will give you information on students' abilities to do a complete analysis of a situation using the χ^2 statistic.
- Using Vertex Form will illustrate students' ability to pull together and use the various components of the vertex form of a quadratic.
- Squares and Expansions will demonstrate students' developing understanding of the technique of completing the square.
- How Much Can They Drink? will provide information on students' developing understanding of how to find the maximum value of a quadratic function to find the solution to a problem in context.
- Another Rocket will show how well students are prepared to address the unit problem.
- A Fireworks Summary is a reflective piece in which students summarize their work on the unit problem.
- A Quadratic Summary is a reflective piece in which students summarize their understanding of the big ideas of the unit.
- Graphing Alice: This assignment will give you information about how well students understand the basic Alice metaphor and about their comfort with nonlinear graphs.
- Having Your Cake and Drinking Too: This activity will reveal students' ability to work with the Alice metaphor in a complex situation.
- Negative Reflections: This assignment will tell you how well students understand the extension of exponentiation to negative exponents.
- All Roads Lead to Rome: This activity will give you information on students' ability to synthesize a variety of approaches to understanding a mathematical concept.
- Alice on a Log: This assignment will give you information on students' understanding of the basics about logarithms.

NOTE: When developed in Phase II, individual units will better define the assessment tools and demonstrate how they will be used formatively and summative.

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