

SEC II PLD	Standard	Below Proficient	Approaching Proficient	Proficient	Highly Proficient
Policy		The Level 1 student is below proficient in applying the English language arts/literacy, mathematics, and science knowledge/skills as specified in the Utah Core State Standards. The student generally performs significantly below the standard for the grade-level/course, is likely able to partially access grade level content and engages with higher order thinking skills with extensive support.	The Level 2 student is approaching proficient in applying the English language arts/literacy, mathematics, and science knowledge/skills as specified in the Utah Core State Standards. The student generally performs slightly below the standard for the grade level/course, is able to access grade-level content and engages in higher order thinking skills with some independence and support.	The Level 3 student is proficient in applying the English language arts/literacy, mathematics, and science knowledge/skills as specified in the Utah Core State Standards. The student generally performs at the standard for the grade level/course, is able to access grade-level content, and engages in higher order thinking skills with some independence and minimal support.	The Level 4 student is highly proficient in applying the English language arts/literacy, mathematics, and science knowledge/skills as specified in the Utah Core State Standards. The student generally performs significantly above the standard for the grade level/course, is able to access above grade-level content, and engages in higher order thinking skills independently.
Number and Quantity					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	N.RN.1	Uses proper notation and uses structure for integer exponents only.	Uses rational exponents and proper notation for radicals in terms of rational exponents, but is unable to explain the meaning.	Explains and uses the meaning of rational exponents in terms of properties of integer exponents, and uses proper notation for radicals in terms of rational exponents.	Proves, uses, and explains the properties of rational exponents (which are an extension of the properties of integer exponents), and extends to real world context.
Range	N.RN.2	Converts radical notation to rational exponent notation.	Identifies equivalent forms of expressions involving rational exponents (but is not able to rewrite or find the product of multiple radical expressions).	Rewrites expressions involving radicals and rational exponents, using the properties of exponents; identifies equivalent forms of expressions involving rational exponents; and converts radical notation to rational exponent notation.	Compares contexts where radical form is preferable to rational exponents, and vice versa.
Range	N.RN.3	Identifies the sum of rational and irrational numbers (where only one irrational value is used).	Identifies the product of rational and irrational numbers (where only one irrational value is used).	Identifies the sum or product of rational and irrational numbers (where multiple irrational values are used).	Generalizes and develops rules for sum and product properties of rational and irrational numbers.
Range	N.CN.1	Recognizes that a negative square root is not a real number.	Converts simple "perfect" squares to complex number form (bi) , such as the square root of -25 is $5i$.	Knows that there is a complex number i such that $i^2 = -1$, and identifies the proper $a+bi$ form (with a and b real).	Generalizes or develops a rule that explains complex numbers and their properties.
Range	N.CN.2	Adds, subtracts, and multiplies simple complex numbers (e.g.: $4i + 5i = 9i$).	Uses the Commutative, Associative, and Distributive properties to identify products and sums of complex numbers.	Identifies sums and products of complex numbers for multi-step problems.	Generalizes or develops rules for abstract problems, such as explaining what type of expression results, when given $(a + bi)(c + di)$.
Range	N.CN.7	Solves quadratic equations (with real coefficients) that have non-complex solutions.	Understands the meaning of a complex number and identifies when quadratic equations will have non-real solutions (but is unable to identify the complex solution).	Solves quadratic equations (with any real coefficients) that have complex solutions.	Creates a quadratic function without x -intercepts, and verifies that the solutions are complex.
Range	N.CN.8	Identifies expanded forms of polynomials with complex numbers.	Identifies factored forms of polynomials, using conjugates (with complex numbers).	Identifies multi-step factored forms of polynomials with complex numbers, such as $(x^2 + 4)^2 - y^2$.	Generalizes and develops rules for situations involving factored and expanded forms of polynomials, with complex numbers.
Range	N.CN.9	Explains the definition of the Fundamental Theorem of Algebra.	Explains and shows the Fundamental Theorem of Algebra is true for quadratic equations (only with real roots).	Knows the Fundamental Theorem of Algebra, shows that it is true for quadratic polynomials, and explains that the Fundamental Theorem of Algebra guarantees that any quadratic function will have a solution in the complex number system.	Identifies what values of a , b , and c will provide rational solutions, irrational solutions, and complex solutions, given $y = ax^2 + bx + c$.
Algebra					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	A.SSE.1a, & 1b	Identifies some of the basic terms (base, exponent, coefficient, and factor) of a quadratic expression.	Identifies the parts of any quadratic expression (not in a context).	Identifies and interprets the parts of quadratic expressions in terms of their context.	Identifies and interprets parts of a variety of different quadratic expressions in terms of their context as more than a single entity.
Range	A.SSE.2	Identifies structure used to rewrite quadratic expressions.	Identifies structure used to rewrite exponential expressions.	Recognizes equivalent forms of complicated expressions, particularly those involving quadratic and exponential functions, and uses the structure of the expression to identify ways to rewrite it.	Rewrites complicated expressions, including those involving quadratic and exponential functions, to equivalent forms, using the structure of the expression. Makes generalizations by rewriting expressions in context, using their structure.
Range	A.SSE.3a	Identifies the zeroes of a quadratic expression written in factored form.	Factors a quadratic expression without a leading coefficient.	Factors a quadratic expression to reveal the zeroes of the function it defines.	Explains conditions for two, one, and no real roots.
Range	A.SSE.3b	Identifies the maximum or minimum of a function, using the graph.	Identifies the maximum or minimum of a function when given in vertex form.	Completes the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Completes the square in a quadratic expression (where b is not divisible by two).
Range	A.SSE.3c	Knows the properties of exponents.	Applies the properties of exponents.	Uses the properties of exponents to transform expressions for exponential functions.	Rewrites rational exponents as radicals.
Range	A.APR.1	Adds or subtracts monomials, where the sum or difference is quadratic.	Multiplies a monomial by a monomial, where the product has a degree of two.	Adds, subtracts, and multiplies polynomials, where the result is quadratic.	Adds, subtracts, and multiplies a quadratic expression in a problem-solving context.
Range	A.CED.1	Identifies a quadratic equation or inequality that models a given situation.	Uses a quadratic equation or inequality to solve a problem.	Creates a quadratic equation or inequality and uses it to solve problems.	Explains the meaning of solutions, and determines when solutions are valid in reference to context.
Range	A.CED.2	Identifies a quadratic graph that represents relationships between quantities.	Graphs a quadratic function.	Writes an equation and creates a graph to represent a quadratic function, from given data.	Interprets the relationship between the independent and dependent variables in a quadratic equation, in reference to context.
Range	A.CED.4	Rearranges a simple quadratic equation (requiring one step).	Rearranges a simple quadratic equation (requiring two steps).	Rearranges formulas (especially quadratic functions) to highlight a quantity of interest, using the same reasoning as in solving equations.	Decides which variable to solve for or isolate, depending upon the given context or problem-solving situation.
Range	A.REI.4a & 4 b	Solves quadratic equations by simple inspection.	Solves quadratic equations by completing the square.	Solves 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.	Determines the most efficient method for solving a quadratic equation and justifies the choice selected.
Range	A.REI.7	Identifies by inspection the number of solutions for a system.	Finds approximate solutions of a system of equations from a graph.	Solves a simple system (consisting of a linear equation and a quadratic equation in two variables) algebraically and graphically.	Generalizes the number of solutions, given a system consisting of a linear equation and a quadratic equation.
Functions					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	F.IF.4	Identifies key features of a graph, such as intercepts, relative maximums and minimums, axes of symmetry and end behavior.	Identifies key features of a function (not given as a graph), such as intercepts, relative maximums and minimums, axes of symmetry, and end behavior.	Creates graphs showing key features, given a verbal description of the relationship.	Creates graphs to model a situation.
Range	F.IF.5	Identifies domains of functions, given a graph.	Identifies a domain in a particular context.	Relates the domain of a function to its graph, and, where applicable, to the quantitative relationship it describes.	Models a function in context of real-world domain.
Range	F.IF.6	Identifies the rate of change from a table that models a quadratic over a specific interval.	Estimates the rate of change of a quadratic function from a graph.	Calculates and interprets the average rate of change of a quadratic function over a specified interval. Estimates the rate of change from a graph.	Compares rates of change in quadratic functions with real-world models.

Range	F.IF.7a	Evaluates quadratic functions.	Identifies key features of quadratic graphs when the graph is given.	Graphs quadratic functions, showing intercepts, maxima, and minima. Can graph functions expressed symbolically and can show key features of the graph (by hand in simple cases, and using technology for more complicated cases).	Graphs and compares quadratic functions expressed in various forms.
Range	F.IF.7b	Evaluates piecewise, step, and absolute value functions.	Identifies key features of piecewise, step, and absolute value graphs, when the graph is given.	Graphs piecewise-defined functions, step functions, and absolute value function, and shows intercepts, maxima, and minima. Can graph functions expressed symbolically and can show key features of the graph (by hand in simple cases, and using technology for more complicated cases).	Graphs and compares piecewise, step, and absolute value functions in various forms.
Range	F.IF.8a	Factors quadratic functions to find zeroes, when zeroes are rational numbers.	Identifies zeroes, extreme values, and symmetry of a quadratic function.	Uses the process of factoring and completing the square to show zeroes, extreme values, and symmetry of the graph, and interprets these in terms of context.	Compares different forms of quadratic functions and identifies advantages of each.
Range	F.IF.8b	Evaluates exponential function.	Identifies key features of exponential functions when the graph is given.	Uses the properties of exponents to interpret expressions for exponential functions.	Compares different forms of exponential functions and identifies advantages of each.
Range	F.IF.9	Compares the properties of two functions of the same representation (e.g.: a table to a table, or an equation to an equation).	Compares the properties of two functions of the same type with different representations (such as a quadratic to a quadratic, but using a table and equation).	Compares properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, compares a quadratic equation to an exponential graph.	Creates and compares functions, given a context.
Range	F.BF.1a	Creates a function describing a linear or exponential relationship.	Creates an explicit or recursive expression for a quadratic function.	Determines an explicit expression, a recursive process, or steps for calculation, from a context.	Creates an expression, recursive process, or steps to model with mathematical representations (given a quadratic context).
Range	F.BF.1b	Combines linear and exponential functions using arithmetic operations.	Combines quadratic functions, using addition and multiplication.	Combines quadratic functions using arithmetic operations.	Combines linear, exponential, and quadratic functions, using arithmetic operations in a context.
Range	F.BF.3	Performs vertical translations on linear and exponential graphs. Describes what will happen to a linear or exponential function when $f(x)$ is replaced by $f(x) + k$ (for different values of k).	Identifies the value of k , given $f(x)$ replaced by $f(x) + k$ (on a graph of linear or exponential functions).	Identifies the effect on the graph of replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$, for specific values of k (both positive and negative); finds the value of k , given the graphs.	Identifies the effect on the graph of $f(x)$, given multiple transformations.
Range	F.BF.4a	Solves an equation of the form $f(x) = c$.	Solves an equation of the form $f(x) = c$, and identifies extraneous solutions.	Solves an equation of the form $f(x) = c$, for a simple function f (that has an inverse), and writes an expression for the inverse.	Solves an equation of the form $f(x) = c$, for a simple function f (that has an inverse), and writes an expression for the inverse in a context.
Range	F.LE.3	Compares the values of functions at specific points.	Compares the values of functions over various intervals.	Observes, using graphs and tables, that a quantity increasing exponentially eventually exceeds a quantity that is increasing linearly or quadratically.	Observes, explores, predicts, models, and evaluates different situations that compare linear, quadratic, and exponential functions.
Range	F.TF.8	Shows that the Pythagorean Identity is valid, given numerical values for the identity.	Identifies an unknown trigonometric value by using the Pythagorean Identity.	Proves the Pythagorean Identity $\sin^2 x + \cos^2 x = 1$, and uses it to find basic trig values, given one trig value and the quadrant.	Extends the Pythagorean Identity to prove that trig ratios are constant for similar triangles.
Geometry					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	G.CO.9	Defines theorems about lines and angles.	Determines the validity of statements within a given proof of a theorem about lines and angles.	Proves theorems about lines and angles.	Applies theorems about lines and angles to a real-life context.
Range	G.CO.10	Defines theorems about triangles.	Determines the validity of statements within a given proof of a theorem about triangles.	Proves theorems about triangles. (Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.)	Applies theorems about triangles to a real-life context.
Range	G.CO.11	Defines theorems about parallelograms.	Determines the validity of statements within a given proof of a theorem about parallelograms.	Proves theorems about parallelograms.	Applies theorems about parallelograms to a real-life context.
Range	G.SRT.1a,b	Identifies dilations.	Identifies the scale factors of dilations.	Verifies the properties of dilations given by a center and a scale factor, by understanding that a dilation creates parallel lines and line segments in ratios of the scale factor.	Locates the center of dilation and scale factor, given a pair of similar figures on a coordinate plane.
Range	G.SRT.2	Identifies corresponding parts of two similar figures.	Determines if two given figures are similar.	Explains that two given figures are similar in terms of similarity transformations.	Proves or disproves that two given figures are similar, using transformations and the definitions of similarity.
Range	G.SRT.3	Identifies similarity transformations.	Identifies triangle similarity by the use of the AA criterion.	Establishes the AA criterion for two triangles to be similar by using the properties of similarity transformations.	Proves that two triangles are similar if two angles of one triangle are congruent to two angles of the other triangle, using the properties of similarity transformations.
Range	G.SRT.4	Defines theorems about triangles.	Determines the validity of statements within a given proof of a theorem about triangles.	Proves theorems about triangles. (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.)	Applies theorems about triangles to a real-life context.
Range	G.SRT.5	Finds measures of sides and angles of congruent and similar triangles.	Solves problems involving triangles, using congruence and similarity criteria.	Solves problems and proves relationships in geometric figures by using congruence and similarity criteria for triangles.	Proves conjectures about congruence or similarity in geometric figures, using congruence and similarity criteria for triangles.
Range	G.SRT.6	Understands that, in similar triangles, corresponding angles are congruent and ratios of corresponding sides are equal.	Defines sine, cosine, and tangent as the ratio of sides of a right triangle.	Understands that the ratio of two sides in one triangle is equal to the ratio of the corresponding two sides of all other similar triangles, leading to definitions of trigonometric ratios for acute angles.	Determines the similarity of right triangles by comparing the trigonometric ratios of the corresponding sides.
Range	G.SRT.7	Understands that the acute angles of a right triangle are complementary.	Identifies the relationship between the sine and cosine of the acute angles of a right triangle.	Explains the relationship between the sine and cosine of complementary angles.	Solves for missing angles of right triangles using sine and cosine.
Range	G.SRT.8	Solves right triangles using the Pythagorean Theorem.	Applies the Pythagorean Theorem in real-life and mathematical contexts.	Solves right triangles using trigonometric ratios and the Pythagorean Theorem in applied problems.	Models solutions to situations, using trigonometric ratios and the Pythagorean Theorem, by constructing equations that can be used to solve the problem.
Range	G.C.1	Identifies that all circles are similar.	Solves problems using the fact that all circles are similar.	Proves that all circles are similar.	Solves applied math problems, using the fact that all circles are similar.
Range	G.C.2	Identifies inscribed angles, radii, and chords in circles.	Identifies relationships among inscribed angles, radii, and chords in circles.	Describes relationships among inscribed angles, radii, and chords in circles.	Solves problems using relationships among inscribed angles, radii, and chords in circles.
Range	G.C.3	Identifies inscribed and circumscribed circles of a polygon.	Constructs the inscribed and circumscribed circles of a triangle.	Proves properties of angles for a quadrilateral inscribed in a circle.	Proves the unique relationships between the angles of a triangle or quadrilateral inscribed in a circle.
Range	G.C.4	Identifies a tangent line from a point outside a given circle to the circle.	Sketches an approximate tangent line from a point outside a given circle to the circle.	Constructs a tangent line from a point outside a given circle to the circle.	Constructs a line that is tangent to two given circles.

Range	G.C.5	Identifies a sector area of a circle as a proportion of the entire circle.	Defines a sector area of a circle as a proportion of the entire circle.	Derives the formula for the area of a sector, and derives, using similarity, the fact that the length of the arc intercepted by an angle is proportional to the radius.	Proves that the length of the arc intercepted by an angle is proportional to the radius, with the radian measure of the angle being the constant of proportionality.
Range	G.GPE.1	Identifies the center and radius of a circle, given an equation written in $(x - h)^2 + (y - k)^2 = r^2$ form.	Creates the equation for a circle, when given the center and radius.	Completes the square to find the center and radius of a circle given by its equation.	Determines the equation of a circle, given points of tangency.
Range	G.GPE.2	Identifies the directrix and focus of a parabola when given its graph.	Identifies the directrix and focus of a parabola when given the equation.	Derives the equation of a parabola, given a focus and directrix.	Justifies conditions for when a point is or is not part of a parabola, given information about the focus and directrix.
Range	G.GPE.6	Finds the point on a line segment that partitions the segment in a given ratio, given a visual representation of the line segment.	Finds the point on a line segment that partitions the segment in a given ratio, given coordinates for the line segment.	Finds the point on a directed line segment (between two given points) that partitions the segment in a given ratio.	Constructs a line segment that is partitioned in a given ratio.
Range	G.GPE.4	Solves problems algebraically, using geometric theorems involving a circle on the coordinate plane.	Proves simple geometric theorems using coordinates, when given a visual representation on the coordinate plane.	Proves simple geometric theorems algebraically using coordinates, such as proving a point lies on a given circle.	Constructs visual representations on the coordinate plane that meet given conditions for coordinates.
Range	G.GMD.1	Informally describes the formulas for the circumference and area of a circle.	Informally describes the formulas for the volume of a cylinder, pyramid, and cone by the use of dissection arguments.	Explains the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	Proves the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.
Range	G.GMD.3	Substitutes given dimensions into the formulas for the volume of cylinders, pyramids, cones, and spheres.	Computes the volume of cylinders, pyramids, cones, and spheres, given a graphic.	Solves problems using the volume formulas for cylinders, pyramids, cones, and spheres.	Finds the volume of cylinders, pyramids, cones, and spheres in a real-life context.
Statistics and Probability					
		The Level 1 Student:	The Level 2 Student:	The Level 3 Student:	The Level 4 Student:
Range	S.CP.1	Identifies an event as a subset of a set of outcomes (a sample space).	Identifies or shows relationships between sets of events, using Venn diagrams.	Describes events as subsets of sample space using characteristics of the outcomes, or using appropriate set language and appropriate set representations (unions, intersections, or complements).	Using complex representations, makes sense of outcomes in context. (For example: unions of all subsets would equal the sample space).
Range	S.CP.2	Calculates probabilities for events (including joint probabilities).	Identifies whether events are independent or dependent, using basic strategies and recall.	Understands that two events, A and B , are independent, if the probability of A and B occurring together is the product of their probabilities, and uses this characterization to determine if they are independent.	Contrasts several events in a sample space and determines if they are independent by calculating the event probabilities.
Range	S.CP.3	Understands conditional probability and how it applies to real life events.	Calculates conditional probabilities.	Determines the independence of A and B using conditional probabilities.	Identifies and interprets independence of events in contextual problems, using conditional probabilities.
Range	S.CP.4	Constructs two-way frequency tables of data.	Approximates conditional probabilities using two-way frequency tables.	Interprets two-way frequency tables of data and uses them to decide if events are independent.	Constructs, interprets, and finds missing values of a two-way frequency table.
Range	S.CP.5	Expresses conditional probabilities and independence using probability notation.	Interprets conditional probabilities and independence in context.	Recognizes and explains the concepts of conditional probability and independence, in everyday language and everyday situations.	Using concepts of conditional probability and independence, extrapolates the meaning behind probabilities that were calculated from real-world context.
Range	S.CP.6	Distinguishes between compound and conditional probability scenarios.	Finds the conditional probability of A , given B as the fraction of B 's outcomes that also belong to A , using a two-way table, Venn diagram, or tree diagram.	Interprets conditional probability in terms of a uniform probability model.	Compares and contrasts conditional probabilities and compound probabilities. (For example: from a table, determine the probability of getting the flu, and then compare that to the probability of getting the flu given the individual never washes their hands).
Range	S.CP.7	Recalls the Addition Rule.	Applies the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ to calculate a probability, in a given context.	Applies the general Addition Rule to a uniform probability model, and interprets the answer in terms of the model.	Applies the Addition Rule to different representations of probability models (Venn diagram, tree diagram, and two-way tables), and interprets the answer in an abstract or real-world context.
Range	S.CP.8	Recalls the Multiplication Rule.	Applies the Multiplication Rule, $P(A \text{ and } B) = P(A) \cdot P(B A) = P(B) \cdot P(A B)$, to calculate a probability in a given context.	Applies the general Multiplication Rule to a uniform probability model, and interprets the answer in terms of the model.	Applies the Multiplication Rule to different representations of probability models (Venn diagram, tree diagram, and two-way tables), and interprets the answer in an abstract or real-world context.
Range	S.CP.9	Understands that a permutation is a rearrangement of the elements of an ordered list. Understands that a combination is the number of ways to choose r items from a set of n elements.	Calculates probabilities using the permutation and combination formulas.	Uses permutations and combinations to compute probabilities of compound events and solve problems.	Uses permutations and combinations to compute probabilities of compound events and solve problems in a complex context, and extends ideas to real-world models.
Range	S.MD.1	Distinguishes between fair games and unfair games.	Analyzes the fairness of games by determining the probabilities of the possible outcomes.	Uses probabilities to make fair decisions (drawing by lots, using a random number generator).	Is able to create a game, activity, problem, or event, based on random events, and writes rules that are based on fair and non-fair outcomes.
Range	S.MD.2	Analyzes decisions and strategies using basic probability concepts, where scaffolding and guided information is given.	Informally assesses the outcome of decisions or strategies, when presented with data with context.	Analyzes decisions and strategies using probability concepts.	Analyzes experimental designs and sampling strategies using probability concepts, and supports claims using specific probability calculations.