Unwrapping the Standards 1

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Extend the Properties of Exponents to Rational Exponents (N-RN Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * The Rules of Exponents
* A radical can be written in exponential form
* A rational exponential expression can be rewritten as a radical
 | * Explain the meaning of a rational exponent through the use of the properties of exponents.
* Demonstrate how a radical can be written in exponential form.
* Rewrite a rational exponent expression as a radical.
 | * Remembering
* Applying
* Applying
 |
| Vocabulary: Rational exponent, integer exponent, exponent, base, rational number, radical, square roots, cube roots, radical symbol |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
 |

Unwrapping the Standards 2

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Use Complex Numbers in polynomial Identities and Equations (N-CN Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * All numbers can be represented *a* + *bi.* The commutative, associative and distributive properties hold for complex numbers.
* Radicals can be simplified. A quadratic equation can have 2, 1, or No real solutions. A complex solution is imaginary.
* That the degree of the polynomial tells you the maximum number of solutions a function could have. That solutions of a polynomial can be real or complex
 | * Use properties to add complex numbers. Use the conjugate to divide complex numbers. Multiply using the distributive property
* Solve quadratic equations that have complex solutions. Use *b2 –* 4*ac* to decide if a solution to a quadratic equation is real. Use the quadratic formula to solve a quadratic equation.
* Find the solutions of a quadratic equation using technology. Create a quadratic equation from solutions that are given
 | * Understanding
* Analyzing
* Creating
 |
| Vocabulary: *i*, complex number, real number, commutative property, associative property, distributive property, complex conjugate, imaginary numbersQuadratic equation, quadratic formula, real number coefficient, complex solution, complex roots or zeros, discriminant, +(factor, sum of squares, polynomial, Fundamental Theorem of Algebra, Linear Factorization Theorem) |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
 |

Unwrapping the Standards 3

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Understand the relationship between zeros and factors of polynomials (A-APR Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * That when a polynomial is divided by *x-a* and the remainder is zero, *a* is zero and *x-a* is a factor of the polynomial.
* The factoring p (*x*) will find the zeros. To set factors equal to zero and solve for x to find the zeros (solutions). That zeros, solutions, roots, x-intercepts all mean the same thing. The shape of the graph given the degree.
 | * Divide polynomials using long division and synthetic division. Find the remainder from polynomial division. Apply the remainder theorem.
* Sketch a rough graph given the zeros. Identify the zero from a factor by setting the factors equal to zero and solving for x. Use a zero as a factor. Predict the shape of a function given all the zeros, degree, leading coefficient of polynomial
 | * Applying
* Analyzing
 |
| Vocabulary: Remainder Theorem, polynomial, long division, synthetic division, divisor, factor, remainder, quotient, factor theorem, zeros, polynomial function, factorization, x-intercept, y-intercept, multiplicity.  |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 4

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Create Equations that describe numbers or relationships.** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * How to translate from verbal expressions to symbolic expressions. Linear functions, quadratic functions, exponential functions and rational functions and parameters for each. Differentiate between linear, quadratic, exponential and rational patterns in a table or a real-world situation
 | * Identify the variables and quantities represented in a real-world problem. Determine the appropriate model for the real-world problem (linear equation, linear inequality, quadratic equation, Quadratic inequality, rational equation, exponential equation). Write the equation or inequality that best models the problem. Solve an equation or inequality and interpret the solution in the context. Graph equations on coordinate axes with appropriate labels and scales. Solve formulas for a specified variable.
 | * Analyzing
 |
| Vocabulary: linear, quadratic, rational, exponential, coordinate axes, scale, labels, constraints, systems of inequalities, solutions, extraneous |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 5

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Understand solving equations as a process of reasoning and explain the reasoning (Major Cluster A-REI)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * How to find solutions of *f(x) = g(x)* using technology. That the intersection of two functions is the point (coordinates) both functions share. The independent variable is *x*. The dependent variable is y
 | * Explain why the *x*-value is the solution to *f(x) = g(x)*. If a solution exists, solve a system of equations (linear, polynomial, rational, absolute value, exponential, and logarithmic) by a table of values. Solve a system of equations graphically. Solve a system of equations that model real world situations. Infer that if y = f(x) and y =g(x), then (x, y) is a solution to f(x) = g(x)
 | * Evaluating
 |
| Vocabulary: x-coordinate, intersection, solution, linear function, polynomial function, rational function, absolute value function, exponential function, logarithmic function, system of equations, substitution property, hyperbola, asymptotes |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
 |

Unwrapping the Standards 6

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Solve equations and inequalities in one variable (Major Cluster A-REI)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * How to solve rational and radical equations in one variable.
* That is possible to introduce an extraneous answer. That extraneous solution is an answer that is a solution arithmetically but not practically
 | * Solve a rational equation in one variable. Solve a radical equation in one variable
* Identify an extraneous solution. Give an example on when an extraneous solution may arise.
 | * Applying
* Evaluating
 |
| Vocabulary: Rational equation, radical equation, extraneous solution, cross multiplication.  |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
 |

Unwrapping the Standards 7

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Interpret functions that arise in applications in terms of context (F-IF Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * What intercepts of a graph are. When a function is increasing. When a function is decreasing. When a function is positive. When a function is negative. What a relative maximum point is. What a minimum point is. Whether a graph has symmetries. How to describe end behaviors of a graph. If graphs are periodic
* Define a domain of a function in an equation, table, graph, or situation.
* How to calculate rate of change. Rate of change is the slope of a line segment between two points.
 | * Can apply real world data to a graph and an equation. Find the intercepts of a graph. Find intervals where the graph is increasing or decreasing. Find intervals where the graph is positive or negative. Locate the maximum and minimum points of a graph. Give equations of the lines of symmetries. Describe end behavior of a graph
* Relate the domain of a function to its graph. Relate the domain of a function to the quantitative relationship it describes. State the appropriate domain and defend my choice. Explain why other choices may be excluded
* Calculate the average rate of change of a function over a specified interval. Interpret the meaning of average rate of change for any given function. Use the slope formula to compare the rates of 2 or more functions
 | * Evaluating
* Analyzing
* Analyzing
 |
| Vocabulary: x-intercept, y-intercept, interval, increase, decrease, maximum, minimum, symmetry, end behavior, periodicity, function, domain, range |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 8

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Analyze Functions using different representations (F-IF Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * How to factor a polynomial. How to set each factor equal to zero to find the zeros of the polynomial. How to graph any function. How to find intercepts. How to find other key features of a graph. How to describe end behavior of functions. How to factor polynomials when factorable using the graph
 | * Graph a polynomial function. Factor a polynomial to identify the zeros of a polynomial. Describe the end behavior of a polynomial. Identify the maximum and minimum points of a function if they exist. Find intercepts of a function. Identify the vertex. Find other key features of a function. Use technology to find maximum/minimum. Use *x → ±* ∞ to describe end behavior
 | * Analyzing
 |
| Vocabulary: Evaluate, function, domain, input, equation, parent function, transformation, slope, x-intercept, y-intercept, linear function, coordinate plane, vertex, quadratic function, maximum, minimum, square root function, cube root function, piecewise function, step function, absolute value function, factor, polynomial, synthetic division, polynomial function, end behavior, turning point, zero, multiplicity, rational function, vertical asymptote, horizontal asymptote, exponential function, logarithmic form, exponential form, logarithmic function, trigonometric function, period, midline, amplitude.  |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 9

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Build a function that models a relationship between two quantities (F-BF Major Cluster).** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * Recall the parent function. How to perform basic operations on two or more functions.
 | * Combine standard function types using arithmetic operations. Write a function that describes a relationship between two quantities. Identify the quantities
 | * Creating
 |
| Vocabulary: Quantity, function, parent function, transformation, composition of functions. |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 10

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Interpret expressions for functions in terms of the situations that they model. (F-LE Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * Define a logarithm. The product, quotient, and power properties of logarithms
 | * Solve exponential models of base 2, 10, or e by using logarithm. Convert logarithmic form to exponential form. Convert exponential form to logarithm form
 | * Applying
 |
| Vocabulary: Exponential function, logarithmic function, logarithmic form, base, change of base, evaluate |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 11

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Interpret Models (S-ID Major Cluster)** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * I know the definition of normal distribution. I know how to find the mean. I know how to find standard deviation. I know what a normal curve looks like. I know the 68-95-99.7 rule. I know what standard deviation measures and why it’s used.
 | * I can use mean and standard deviation of a set of data to fit the data to a normal curve. I can use the 68-95-99.7 rule to estimate the percent of a normal population that falls within 1, 2, or 3 standard deviations of the mean.
 | * Applying
 |
| Vocabulary: Mean, Standard Deviation, Data Set, Normal Distribution, 68-95-99.7 Rule, Percent, Population |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
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Unwrapping the Standards 12

**Content Area:** Algebra 2 **Completed By:**

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| **Essential Standard: Understand independence and conditional probability and use them to interpret data. (S-CP Major Cluster).** |
| **Skills and Concepts** |
| 1. Students will know…(the concepts that support the standard) | 2. And be able to….(the skills students are able to demonstrate after instruction) | 3. Level of thinking (from one of the 3 frameworks listed on below) |
| * Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
 | * I can organize categorical data in two-way frequency tables. I can interpret joint probability in the context of the data. I can interpret marginal probability in the context of the data. I can interpret conditional probability in the context of the data. I can determine if two events are independent
 | * Evaluating
 |
| Vocabulary: Conditional probability, frequency, frequency tables, independent events, dependent events, sample space. |

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| **Bloom’s Taxonomy** | **Marzano’s Taxonomy** | **Webb’s Depth of Knowledge** |
| * Remembering
* Understanding
* Applying
* Analyzing
* Evaluating
* Creating
 | **** Level 1: Retrieval**** Level 2: Comprehension**** Level 3: Analysis**** Level 4: Knowledge utilization**** Level 5: Metacognition**** Level 6: Self-System thinking | * Recall and reproduction (DOK 1)
* Skills and Concepts (DOK 2)
* Strategic thinking/complex reasoning (DOK 3)
* Extended thinking/reasoning (DOK 4)
 |