Skills in Major Concepts

Algebraic Functions
10 Skills in 3 Major Concepts

**Function Properties:**
Understanding the Multiple Characteristics of a Function
- **Function Notation** F548 I will use function notation and identify the domain and range of functions.
- **Avg. Rate of Change** F554 I will calculate and interpret the average rate of change of a function over a specified interval.
- **Compare Functions** F555 I will compare properties of two functions each represented in a different way.

**Linear Functions:**
Recognizing Constant Change in a Scenario
- **8th Grade**
  - **Slope & Y-Intercept** F145 I will determine the slope and y-intercept of a line from a graph, and explain what slope and y-intercept mean in real world and mathematical problems.
  - **Construct Functions** F224 I will construct a function to model a linear relationship and describe the rate of change and initial value.
  - **Linear Relationships** F232 I will represent, analyze, and compare linear relationships in graphs, equations, and tables.
  - **Slope Given 2 Points** F322 I will determine the slope and the equation of a line given the coordinates of two points on the line.

**Understanding Functions:**
Making Sense of When Two Variables are Connected
- **8th Grade**
  - **Linear Functions** F167 I will use graphs to represent linear functions given by equations or linear data from a table.
  - **Function Rules** F188 I will determine function rules of functions represented in tables.
  - **Functions** F325 I will define and identify functions in tables, graphs, and ordered pairs.
**Dimensional Geometry**
5 Skills in 2 Major Concepts

### Understanding Area:
Recognizing Attributes of 2-D Figures
Pre: 2nd-4th Grade Foundational

- **Rectangular Area** G248 I will find the area of a rectangle by counting the number of square units needed to cover it and show this is the same as calculating the area by multiplying the length by the width.
- **Perimeter & Area** G153 I will explore the relationship between the perimeter and area of rectangles.
- **Additive Area** G589 I will recognize area as additive and find the area of polygons composed of rectangles.

### Understanding Volume:
Recognizing Attributes of Solid Figures
5th Grade

- **Rectangular Volume** G112 I will develop and use a volume formula for rectangular prisms by counting the cubic units needed to fill the rectangular prism without gaps or overlaps.
- **Additive Volume** G519 I will solve real world and mathematical problems involving additive volume and right rectangular prisms.

**Evaluating Expressions**
5 Skills in 2 Major Concepts

### Evaluating Algebraic Expressions:
Grasping the Power of Substitution and Variables
6th Grade

- **Substitution** A116 I will use substitution to evaluate algebraic expressions or formulas using the order of operations, including parentheses and exponents.
- **Substitution** A203 I will substitute values into algebraic expressions and evaluate the expressions.
- **Equal Expressions** A478 I will apply the properties of operations to generate equivalent expressions and check the equivalency using substitution.

### Evaluating Numerical Expressions:
Unraveling How Operations Work Together
6th Grade

- **Order of Operations** A138 I will evaluate numerical expressions using the order of operations, including parentheses and exponents.
- **Exponents** A265 I will translate between repeated multiplication and exponential form and find the value of a whole number raised to a power.
Fraction Operations
12 Skills in 4 Major Concepts

- Adding and Subtracting Like Fractions:
  Applying Basic Operations to Fractions
  Pre: 2nd-4th Grade Foundational
  - Rewrite Fractions N109 I will decompose a fraction or mixed
    number into a sum of fractions with the same denominator
    in more than one way, recording each decomposition by an
    equation.
  - Add/Subtract Like Fractions N171 I will add and subtract
    fractions with like denominators.
  - Add/Subtract Like Mixed Numbers N515 I will add and
    subtract mixed numbers with like denominators.

- Adding and Subtracting Unlike Fractions:
  Making the Connection Between Equivalent Fractions and Addition
  5th Grade
  - Add/Subtract Unlike Mixed Numbers N257 I will add and
    subtract mixed numbers with unlike denominators.
  - Add/Subtract Unlike Fractions N283 I will add and subtract
    fractions with unlike denominators.

- Dividing Fractions:
  Grappling With How Division Can Result in a Larger Answer
  5th, 6th Grade
  - Divide Fractions by Whole Numbers N505 I will divide unit
    fractions by whole numbers in real world and mathematical
    problems.
  - Divide Whole Numbers by Fractions N506 I will divide whole
    numbers by unit fractions in real world and mathematical
    problems.
  - Divide Fractions N318 I will divide fractions.

- Multiplying Fractions:
  Grappling with How Multiplication Can Result in a Smaller Answer
  5th Grade
  - Multiply Fractions N107 I will multiply fractions.
  - Multiply Mixed Numbers N187 I will multiply mixed numbers.
  - Multiply Whole Numbers by Fractions N391 I will multiply whole
    numbers by fractions.
  - Fractional Area N527 I will find the area of a rectangle with
    fractional side lengths.

Operations with Algebraic Expressions
7 Skills in 2 Major Concepts

- Operations with Linear Expressions:
  Applying Integer Operation Rules to Algebraic Expressions
  7th Grade
  - Linear Expressions A139 I will add and subtract linear
    algebraic expressions.
  - Expand Expressions A541 I will expand linear expressions.
  - Factor Expressions A546 I will factor linear algebraic
    expressions

- Polynomial Operations:
  Applying Basic Operations to Complex Algebraic Expressions
  Algebra 1
  - Add/Subtract Polynomials A237 I will add and subtract
    polynomials.
  - Multiply Polynomials A259 I will multiply a binomial by a
    monomial or a binomial.
  - Polynomials A267 I will identify polynomials and represent
    them in standard form.
  - Multiple/Divide Monomials A337 I will multiply and divide
    monomial expressions with a common base.
Percents
9 Skills in 3 Major Concepts

**Applying Percents:**
Making Sense of Percents and the World Around Us
7th Grade

- Simple Interest N243 I will solve real world and mathematical problems about simple interest.
- Percent Change/Error N299 I will calculate percent of change and percent of error.
- Multistep Percents N509 I will solve multistep percent problems.
- Percent Increase/Decrease N584 I will solve problems involving percent increase/decrease.

**Representing Rational Numbers:**
Converting Between Multiple Forms of the Same Number
7th Grade

- Represent Fractions as Decimals N231 I will represent fractions as terminating or repeating decimals.
- Rational Numbers A250 I will represent rational numbers in multiple ways.

**Understanding Percents:**
Recognizing Parts Per Hundred
6th Grade

- Find Percentages From Ratios N141 I will determine percents from ratios.
- Real World Percents N292 I will solve real world and mathematical problems involving percents, including finding the whole, given a part and percent.
- Represent Percents N588 I will represent percents as decimals to hundredths, fractions out of 100, and on a 100 grid.
Place Value
10 Skills in 4 Major Concepts

■ Compare Whole Numbers:
Applying Place Value to Evaluate Numerical Magnitude
Pre: 2nd-4th Grade Foundational

- Compare Whole Numbers N582 I will compare two three-digit numbers.
- Compare Whole Numbers N169 I will compare whole numbers up to millions.

■ Properties and Powers of 10:
Conceiving How Place Value is Impacted
5th Grade

- Multiply/Divide by Powers of 10 N101 I will explain patterns about multiplying or dividing decimal numbers by powers of ten.
- Multiply by powers of 10 N578 I will explain patterns in the number of zeros in the products when multiplying whole numbers by 10, 100, and 1,000.

■ Decimal Place Value:
Representing Parts Per Ten, Hundred, Thousand
5th Grade

- Compare Decimals N176 I will compare and order decimals using the math symbols <, >, and =.
- Rounding Decimals N196 I will use rounding rules to round numbers to the ones place and decimal place values.
- Read/Write Decimals N277 I will read and write decimal numbers using base ten numerals, number names, and expanded form.

■ Whole Number Place Value:
Making Sense of Our Numbers
Pre: 2nd-4th Grade Foundational

- Read/Write Whole Numbers N580 I will read and write numbers to 1,000 using base-ten numerals, number names, and expanded form.
- Round Whole Numbers N142 I will round whole numbers to the nearest ten, hundred, or thousand.
- Read/Write Whole Numbers N576 I will read and write whole numbers up to millions using base-ten numerals, number names, and expanded form.
**Ratio Reasoning**
10 Skills in 3 Major Concepts

**Proportional Relationships:**
Grappling With How Two Quantities are Related
7th, 8th Grade

- **Proportion Graphs** N161 I will graph a proportional relationship and explain what a point (x, y) on the graph means in terms of a situation.
- **Ratios/Proportions** N230 I will use ratio reasoning to decide if two quantities are in a proportional relationship.
- **Proportion Equations** N510 I will represent proportional relationships by equations.

- **Compare Proportions** A513 I will graph proportional relationships, interpreting the unit rate as the slope of the graph and compare two different proportional relationships represented in different ways.

**Rates:** Understanding How Values Change in Relation to Each Other
6th, 7th Grade

- **Unit Rates** N226 I will understand the concept of rate and calculate and compare unit rates.
- **Constant Rates** N523 I will solve real world and mathematical problems involving constant rates.
- **Fractional Unit Rate** N501 I will compute unit rates associated with ratios of fractions.

**Ratios:** Representing the Relationship Between Two Values
6th Grade

- **Equivalent Ratios** N117 I will make tables of equivalent ratios, find missing values in the tables, plot the pairs of values on a coordinate plane, and use tables to compare ratios.
- **Ratios** N213 I will know how ratios work and express ratios in different forms using ratio language.
- **Ratio/Rate Reasoning** N317 I will use ratio reasoning to convert measurement units and manipulate and transform units appropriately when multiplying or dividing quantities in real world and mathematical problems.

**Rational Numbers**
8 Skills in 2 Major Concepts

**Operations with Rational Numbers:**
Realizing Rules for Integer Operations
7th Grade

- **Multiply/Divide Rational Numbers** N106 I will multiply and divide integers and other rational numbers.
- **Subtract Rational Numbers** N152 I will subtract integers and other rational numbers with and without the use of a number line.
- **Add Rational Numbers** N182 I will add integers and other rational numbers with and without the use of a number line.
- **Add, Subtract, Multiply, Divide Rational Numbers** N522 I will solve real world and mathematical problems involving the four operations with rational numbers, especially negative numbers.

**Rational Numbers and the Number Line:**
Making Sense of the Numbers Around Us
6th Grade

- **Coordinate Plane** N209 I will identify and plot points in all four quadrants of a coordinate plane.
- **Absolute Value** N304 I will find and interpret the absolute value of positive and negative rational numbers in mathematical and real world situations.
- **Order Rational Numbers** N499 I will write, interpret, and explain statements of order for rational numbers on the number line and in real world contexts.
- **Represent Integers** N567 I will use integers and other rational numbers to represent numerical situations and place them on a number line.
Solving Basic Equations
6 Skills in 3 Major Concepts

- **Basic Algebraic Thinking:**
  Realizing the Connection Between Operations
  Pre: 2nd-4th Grade Foundational
  - Add/Subtract Equations N133 I will determine an unknown whole number in an addition or subtraction equation.
  - Multiply/Divide Equations A149 I will determine an unknown whole number in a multiplication or division equation.

- **Two-Step Equations:**
  Making Sense of Balance When Solving for the Unknown
  7th Grade
  - 2-Step Equations A179 I will solve two-step equations.
  - 2-Step Equations A389 I will solve two-step equations with positive and negative numbers.

Solving Complex Equations
7 Skills in 3 Major Concepts

- **Manipulating Linear Equations:**
  Grappling with Different Applications of Linear Functions
  Algebra 1
  - Linear Equations A326 I will write the equation of a line, given its slope and the coordinates of a point on the line.
  - Slope Given Equation F329 I will determine the slope of a line, given its equation in any form.

- **Solving Complex Linear Equations:**
  Expanding on Inverse Operations to Solve for the Unknown
  Algebra 1
  - Algebraic Situations A331 I will write algebraic equations or inequalities that represent a situation.
  - Literal Equations A345 I will solve literal equations for a given variable.
  - Linear Equations A358 I will analyze and solve verbal problems whose solution requires solving a linear equation in one variable.

- **Simple Equations:**
  Understanding Equivalency to Solve for the Unknown
  6th Grade
  - 1-Step Equations A222 I will solve one-step algebraic equations.
  - 1-Step Equations A524 I will solve problems by writing, solving, and interpreting one-step equations.

- **Multi-Step Equations:**
  Grappling With Complex Equations In Order to Solve for the Unknown
  7th, 8th Grade
  - Distributive Property A294 I will solve algebraic equations using the distributive property.
  - Multi-Step Equations A204 I will solve multistep equations with rational numbers.
  - Variables Both Sides A240 I will solve equations by moving variables to one side of an equation.
  - Solutions to Equations A601 I will give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.
Solving Quadratics
6 Skills in 2 Major Concepts

- **Graphing Quadratics:** Visualizing Non-Linear Functions
  Algebra 1
  - Parabola Aspects F319 I will find the roots, vertex, and axis of symmetry of a parabola given its graph.
  - Quadratic Graphs F547 I will graph quadratic relationships from equations or tables of values.

- **Solving Quadratic Functions:** Manipulating Equations to Solve for Certain Values
  Algebra 1
  - Solve Quadratics A333 I will analyze and solve verbal problems that involve quadratic equations.
  - Multiplication Properties of Zero A349 I will understand and apply the multiplication property of zero to solve quadratic equations by factoring.
  - Solve Quadratics A549 I will solve quadratic equations by completing the square.
  - Quadratic Formula A551 I will derive the quadratic formula and use it to solve quadratic equations.

Systems of Functions
6 Skills in 2 Major Concepts

- **Advanced Systems of Functions:** Solving for Overlap Across Multiple Types of Functions
  Algebra 1
  - Systems of Equations A324 I will solve systems of linear and quadratic equations graphically.
  - Systems of Equations A336 I will solve a system of one linear and one quadratic equation in two variables algebraically.

- **Systems of Linear Equations:** Grappling With How to Satisfy Multiple Functions
  8th Grade
  - Systems on Graphs A236 I will solve systems of two linear equations graphically.
  - Systems of Equations A332 I will analyze and solve verbal problems whose solution requires solving systems of linear equations in two variables.
  - Systems of Equations A335 I will solve systems of two linear equations in two variables algebraically.
  - Systems of Equations A544 I will recognize systems of linear equations that have one solution, no solution, or infinitely many solutions.

Transformational Geometry
7 Skills in 2 Major Concepts

- **Series of Transformations:** Making Sense of How Transformations Relate to Each Other
  8th Grade
  - Transformations G114 I will use transformations to map a figure onto a congruent figure.
  - Transformations N205 I will understand similarity and describe a sequence of transformations that exhibits similarity between two figures.

- **Types of Transformations:** Exploring How Objects Can Change Shape, Size and Direction
  8th Grade
  - Dilations G173 I will draw the image of a figure under a dilation on a coordinate plane.
  - Reflections G194 I will draw the image of a figure under a reflection on a coordinate plane.
  - Rotations G242 I will draw the image of a figure under a rotation on a coordinate plane.
  - Transformations G262 I will verify experimentally the properties of rotations, reflections, and translations.
  - Translations G284 I will draw the image of a figure under a translation on a coordinate plane.
Understanding Fractions
6 Skills in 2 Major Concepts

- **Fraction Equivalence:**
  Realizing Multiple Representations of the Same Quantity
  Pre: 2nd-4th Grade Foundational, 5th Grade
  - Compare Fractions N110 I will compare and order fractions using the math symbols <, >, and =.
  - Equivalent Fractions N126 I will create equivalent fractions and explain fraction equivalence.
  - Simplify Fractions N239 I will simplify fractions to lowest terms.

- **Representing Fractions:**
  Understanding Parts of a Whole
  Pre: 2nd-4th Grade Foundational
  - Describe Fractions N147 I will describe fractions using numbers, words, and pictures.
  - Represent Fractions N579 I will represent fractions on a number line.
  - Understand Decimals N295 I will understand decimals are part of a whole and express decimals as fractions to tenths or hundredths.

Whole Number Operations
12 Skills in 4 Major Concepts

- **Multiply and Divide Multi-Digit Whole Numbers:**
  Expanding on Arithmetic Operations
  5th Grade
  - Multiply Whole Numbers N192 I will fluently multiply multi-digit whole numbers using the standard algorithm.
  - Divide Large Whole Numbers N282 I will divide large whole numbers by whole numbers with two or more digits and explain remainders within context.

- **Understanding Division:**
  Grasping the Idea of Sharing Equally
  Pre: 2nd-4th Grade Foundational, 5th Grade
  - Division Facts A530 I will interpret division as equal shares and know division facts with one-digit numbers.
  - Divide Large Whole Numbers N390 I will divide large whole numbers by one-digit whole numbers and explain remainders within context.
  - Fractions as Division N518 I will interpret fractions as division of the numerator by the denominator and solve whole number division problems leading to answers in the form of fractions or mixed numbers.

- **Understanding Addition and Subtraction:**
  Understanding How Numbers Grow and Reduce
  Pre: 2nd-4th Grade Foundational
  - Add/Subtract on a Number Line N581 I will find sums and differences within 100 and represent them on the number line.
  - Subtract Whole Numbers N210 I will subtract large whole numbers.
  - Add Large Whole Numbers N528 I will add large whole numbers.

- **Understanding Multiplication:**
  Making the Connection Between Multiplication and Addition
  Pre: 2nd-4th Grade Foundational
  - Multiplication Facts A272 I will understand multiplication and know multiplication facts up to 10 times 10.
  - Multiples of 10/100 N115 I will multiply one-digit whole numbers by multiples of 10.
  - Distributive Property A185 I will identify and use the distributive property of multiplication over addition, relating it to area models.
  - Multiply Large Whole Numbers N288 I will multiply large whole numbers by one-digit whole numbers.
Additional Major Concepts
56 Skills in 21 Major Concepts

- **Algebraic Inequalities:** Recognizing Constraints and Limitations
  7th Grade
  - 2-Step Inequalities A144 I will solve one and two-step inequalities and graph the solution set of an inequality on a number line.
  - Translate Algebraic Inequalities A215 I will translate verbal sentences into algebraic inequalities.
  - Equation/Inequality A526 I will write equations or inequalities to represent real world or mathematical problems using rational numbers and solve, comparing arithmetic solutions to algebraic solutions.

- **Adding and Subtracting Decimals:** Applying Basic Operations to Decimals
  5th Grade
  - Add/Subtract Decimals N533 I will add and subtract decimals using a variety of strategies.

- **Dividing Decimals:** Grappling with Division and Place Value
  5th Grade
  - Divide Decimals by Whole Numbers N535 I will divide a decimal by a whole number using a variety of strategies.
  - Divide Decimals by Decimals N583 I will divide a decimal by a decimal using multiple strategies.

- **Exponential Functions:** Grasping the Power of Rapid Growth and Decay
  Algebra 1
  - Compound Interest F300 I will calculate compound interest and solve real world and mathematical problems involving interest.
  - Exponential Growth A334 I will analyze and solve verbal problems that involve exponential growth and decay.
  - Exponential Function F365 I will identify and graph exponential functions.
**Factoring Polynomials:**
Grasping How to Re-Arrange Complex Expressions

Algebra 1

- **GCF of Polynomials** A200 I will factor polynomial expressions using the greatest common factor (GCF) of the terms.

- **Factor Quadratics** A285 I will factor quadratic expressions with three terms.

- **Factor Expressions** A343 I will factor algebraic expressions completely.

- **Factor Trinomials** A550 I will factor trinomials where the leading coefficient is not equal to 1.

**Graphing Linear Inequalities:**
Graphing Restrictions and Finding Solutions to Systems

Algebra 1

- **Graph Linear Inequalities** A363 I will graph linear inequalities in two variables.

- **Systems of Linear Inequalities** A364 I will graph and solve systems of linear inequalities with rational coefficients in two variables.

**Interpreting Functions:**
Making Sense of Different Types of Functions

8th Grade

- **Graphs in Context** F129 I will create graphs to match given descriptions of situations involving a relationship between two variables or describe situations that could match given graphs.

- **Linear vs Non-Linear** A146 I will distinguish between linear and non-linear relationships.

**Laws of Exponents:**
Grappling With How to Write Equivalent Exponent Expressions

8th Grade

- **Laws of Exponents** A111 I will develop and apply the laws of exponents for multiplication and division to generate equivalent numerical expressions.

- **Laws of Exponents** A552 I will generate equivalent expressions in which an exponent is raised to another exponent.

**Missing Angles:**
Understanding Special Angle Relationships

8th Grade

- **Transversals** G249 I will determine angle relationships when two lines (parallel or not) are cut by a transversal and use angle relationships to solve real world and mathematical problems.

- **Triangle Similarity** G316 I will explore and explain triangle similarity, especially the angle angle criterion.

- **Exterior Angles** G512 I will establish facts about the angle sum and exterior angles of triangles.

**Multiplying Decimals:**
Grappling with Multiplication and Place Value

5th Grade

- **Multiply Decimals by Whole Numbers** N534 I will multiply a decimal by a whole number using a variety of strategies.

- **Multiply Decimals by Decimals** N577 I will multiply a decimal by a decimal using a variety of strategies.
Pythagorean Theorem
Make Sense of the Relationship Between Sides of a Right Triangle
8th Grade
- Pythagorean Theorem G261 I will explore and explain the Pythagorean Theorem.
- Pythagorean Theorem G275 I will use the Pythagorean Theorem to determine the unknown length of a side of a right triangle and explore Pythagorean triples.
- Distance Formula G308 I will use and explain the distance formula on a coordinate plane.
- Pythagorean Theorem G221 I will solve real world and mathematical problems using the Pythagorean Theorem.

Rational Equations:
Applying Concepts of Fraction Equivalence to Solve Complex Equations
Post-Algebra
- Algebraic Fractions A347 I will solve equations involving fractional expressions which can be simplified to linear equations in one variable.
- Algebraic Proportion A348 I will solve algebraic proportions in one variable which result in linear or quadratic equations.

Rational Expressions:
Apply Fraction Operations to Complex Operations
Post-Algebra
- Undefined Fractions A339 I will find values of a variable for which an algebraic fraction is undefined.
- Algebraic Fractions A340 I will add or subtract fractional expressions with monomial or like binomial denominators.
- Algebraic Fractions A341 I will multiply and divide algebraic fractions and express the product or quotient in simplest form.
- Polynomial Fractions A360 I will simplify fractions with polynomials in the numerator and denominator by factoring both and rewrite in simplest terms.

Scientific Notation:
Making Sense of Exceedingly Large and Small Numbers
8th Grade
- Scientific Notation A270 I will write and compare numbers in scientific notation.
- Scientific Notation A280 I will solve real world and mathematical problems involving numbers in scientific notation.
- Express Big/Small Numbers A542 I will use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

Sequences:
Recognizing and Applying Complex Patterns
Post-Algebra
- Geometric Sequences F560 I will recognize geometric sequences are functions and write them both recursively and explicitly.
- Arithmetic Sequences F564 I will recognize arithmetic sequences are functions and write them both recursively and explicitly.

Square and Cube Roots:
Grappling with Radicals
8th Grade
- Square Roots A178 I will recognize and state the value of the square root of a perfect square and estimate square roots of other whole numbers.
- Square & Cube Roots N313 I will calculate or estimate square and cube roots of numbers and understand the inverse relationship of powers and roots.
Translating Expressions: Representing Situations in Multiple Ways
6th, 7th Grade

- Simple Inequalities A177 I will write a simple inequality to represent a condition or constraint in a real world or mathematical problem and represent solutions to inequalities on number line diagrams.

- Variables A290 I will use variables to represent numbers and write expressions to represent a real world or mathematical problem.

- Creating Expressions A279 I will translate real world situations into algebraic expressions and equations.

Trigonometric Ratios: Understand How Sides and Angles of Right Triangles Relate to Each Other
Post-Algebra

- Sine/Cosine/Tangent G354 I will find and explain sine, cosine, and tangent ratios of right triangles.

- Sine/Cosine/Tangent G355 I will use inverse sine, cosine, and tangent functions to find the measures of angles in right triangles.

- Sine/Cosine/Tangent G356 I will use sine, cosine, and tangent functions to the find side lengths of right triangles.

Understanding 2-D Objects: Recognizing Attributes of Different Shapes
Pre 2-4th Foundational

- Draw/Measure Angles G172 I will draw and measure angles and classify angles as acute, obtuse, right, and straight.

- Types of Lines G183 I will identify and draw intersecting, perpendicular, and parallel lines.

Understanding Correlation: Exploring the Relationship Between Two Variables
8th Grade, Algebra 1

- Scatterplots S150 I will make and use lines of best fit on scatterplots and their equations to analyze data.

- Correlation and Causation S381 I will distinguish between correlation and causation.

- Corr. Coefficient S558 I will compute and interpret the correlation coefficient of a linear fit.

- Scatterplots S538 I will make and use scatterplots to analyze associations in bivariate data.
**Algebra**

### Pre, 2nd-4th Grade Foundational
- **Generate Patterns** A108 I will generate a number or shape pattern that follows a given rule and identify features of the pattern.
- **Operation Properties** A212 I will define, identify, and use the commutative and associative properties of addition and multiplication.
- **Identify Factors** A220 I will identify all the factors of a given whole number and identify prime and composite numbers.
- **Find/List Multiples** A238 I will calculate and list multiples of whole numbers.
- **Add, Subtract, Multiply, Divide Whole Numbers** A529 I will solve word problems involving operations with whole numbers.

### 5th Grade
- **Order of Operations** A274 I will use the order of operations, including parentheses, to evaluate numerical expressions involving whole numbers.
- **Number Sentences** A507 I will write expressions to record operations with numbers, and interpret numerical expressions without evaluating them.
- **Numerical Patterns** A516 I will generate two numerical patterns using two given rules, graph ordered pairs of corresponding terms on a coordinate plane, and identify apparent relationships between corresponding terms.

### 6th Grade
- **Linear Relationships** A228 I will represent linear relationships in tables, equations, and graphs in the first quadrant of the coordinate plane.

### 7th Grade
- **Distributive Property** A294 I will solve algebraic equations using the distributive property.

### 8th Grade
- **Similar Triangles and Slope** A514 I will use similar triangles to explain constant slope and derive equations to describe lines.

### Algebra 1
- **Histograms** A384 I will summarize, represent, and interpret data in histograms and cumulative frequency histograms.
- **Box & Whisker Plots** A385 I will summarize, represent, and interpret data in box plots, find percentiles, and use a five number summary.
- **Systems & Elimination** A553 I will solve systems of linear equations by eliminating variables.
- **Complete the Square** A556 I will complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

### Enrichment
- **Verbal Expressions** A168 I will write verbal expressions or sentences that match given mathematical expressions or equations.
- **Distance/Rate/Time** A180 I will know the relationships among distance, rate, and time and use it to solve real world and mathematical problems.
- **Compound Inequalities** A207 I will graph compound inequalities on a number line and explain their meaning in mathematical and real world problems.
- **Transversals** A241 I will apply algebra to determine the measure of angles formed by parallel lines cut by a transversal.
- **Angles & Algebra** A291 I will apply algebra to determine the measure of angles formed by intersecting lines.
- **Points on a Line** A323 I will determine whether a given point is on a line, given the equation of the line.
Pre, 2nd-4th Grade Foundational

- **Ruler Measurements** G256 I will use a ruler to measure to the nearest inch or fraction of an inch.
- **Irregular Perimeter** G287 I will calculate the perimeter of regular or irregular polygons and solve problems involving perimeter.

5th Grade

- **Line Graphs** G124 I will make and use line graphs to represent and analyze data.
- **Quadrilaterals** G184 I will classify and draw quadrilaterals by their angles and sides.
- **Customary Units** G223 I will identify and convert among customary units of length, capacity, and mass/weight.
- **Metric Units** G229 I will identify and convert among metric units of length, capacity, and mass/weight.
- **Triangles** G301 I will classify and draw triangles by their angles and sides and find the missing measure of angles in triangles.
- **Fraction Line Plots** G504 I will make line plots to display a data set measured in fractions and use operations with fractions to solve problems involving the data set.
- **Coordinate Plane** G517 I will use a pair of perpendicular lines, called axes, to define a coordinate system and locate points using coordinates.

6th Grade

- **Triangle Area** G120 I will develop and use an area formula in order to determine the area of any triangle.
- **Nets of 3-D Shapes** G122 I will identify two-dimensional shapes that make up the faces and bases of three-dimensional objects and use nets to represent the objects.
- **Shapes on Graphs** G245 I will plot points and determine the area and/or perimeter of shapes drawn on all four quadrants of a coordinate plane.
- **Quadrilateral Area** G264 I will develop and use area formulas in order to determine the area of different types of quadrilaterals.
- **Fractional Volume** G487 I will find the volume of a right rectangular prism with fractional edge lengths and solve real world and mathematical problems using volume.
- **Nets & Surface Area** G508 I will represent figures using nets made up of rectangles and triangles and use the nets to find the surface area of these figures.
- **Complex Shapes** G543 I will find the area and/or perimeter of complex shapes composed of polygons on or off a coordinate plane.
7th Grade

- **Map Scale** G154 I will solve real world and mathematical problems using maps and scale drawings.
- **Circumference** G174 I will explore the relationship between the circumference and diameter of a circle in order to determine the circumference of a circle.
- **Area of 2-D Shapes** G181 I will use a variety of strategies to find the area of two-dimensional geometric shapes composed of polygons and circles.
- **Area of Circles** G198 I will determine the area of circles and the area of sectors of circles.
- **Angle Relationships** G211 I will use angle relationships of intersecting lines to solve mathematical and real world problems.
- **Similar Triangles** G271 I will solve real world and mathematical problems using similar triangles or other similar shapes.
- **Planes & 3-D Shapes** G315 I will explore how planes intersect with three-dimensional shapes.
- **Draw Triangles** G500 I will construct triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
- **Scale Drawings** G511 I will reproduce scale drawings at a different scale.

8th Grade

- **Circular Volume** G444 I will know formulas for the volumes of cones, cylinders, and spheres and use them to solve real world and mathematical problems.

Enrichment

- **3-D Volume** G127 I will calculate the volume of prisms and cylinders using appropriate formulas.
- **3-D Shapes** G159 I will make and use top, front, and side views of three-dimensional shapes.
- **Surface Area** G191 I will determine the surface area of prisms and cylinders.
- **Fahrenheit/Celsius** G206 I will convert temperatures among measurement systems (Fahrenheit and Celsius).
- **Angles of Polygons** G244 I will use the relationship of the measures of the angles of polygons to solve real world and mathematical problems.
- **Circle Word Problems** G255 I will solve real world and mathematical problems involving circles.
- **Dimensional Measures** G309 I will explore and explain how perimeter, area, and volume are affected when the dimensions of three-dimensional objects are scaled.

Number Sense

5th Grade

- **Decimal Operations** N520 I will solve real world and mathematical problems involving operations with decimal numbers that require unit conversions.
- **Add, Subtract, Multiply Fractions** N521 I will solve real world and mathematical problems involving addition, subtraction, and multiplication of fractions including mixed numbers.
- **Order of Operations** N531 I will evaluate numerical expressions including decimals and fractions with parentheses using the order of operations or properties of operations.
### 6th Grade
- **LCM** N170 I will find common multiples and the least common multiple (LCM) of two or more whole numbers.
- **Multiply Decimals** N186 I will fluently multiply multi-digit decimals using the standard algorithm.
- **Divide Large Decimals** N216 I will fluently divide multi-digit decimals using the standard algorithm.
- **Add/Subtract Large Decimals** N233 I will fluently add and subtract multi-digit decimals using the standard algorithm.
- **GCF Whole Numbers** N247 I will find common factors and the greatest common factor (GCF) of two or more whole numbers and rewrite expressions using common factors and the distributive property.
- **Divide Whole Numbers** N532 I will fluently divide multi-digit whole numbers using the standard algorithm.

### 8th Grade
- **Irrational Numbers** N263 I will compare irrational numbers by approximating their value and placing them on a number line and estimate the value of expressions involving irrational numbers.
- **Rational/Irrational** N310 I will know that the numbers that are not rational are called irrational and understand the decimal expansions of different kinds of numbers, including converting repeating decimals into fractions.

### Algebra 1
- **Simplify Radicals** N371 I will simplify radical terms.
- **Add, Subtract, Multiply, Divide Radicals** N372 I will perform the four arithmetic operations using like and unlike radical terms and express the result in simplest form.
- **Add/Multiply (ir)rational Numbers** N557 I will explore and explain properties of sums and products of rational and irrational numbers.
- **Rational Exponents** N563 I will explain how the system of integer exponents extends to rational number exponents, including representing radicals in terms of rational exponents.

### Enrichment
- **Order Rational Numbers** N155 I will order positive and negative rational numbers in different forms and locate them on a number line.
- **Write/Identify Percents** N260 I will read, write, and identify percents less than 1% and greater then 100%.
- **Prime Factorization** N289 I will determine the prime factorization of a number and write it in exponential form.
- **Divisibility Rules** N314 I will explore divisibility rules.

### Statistics & Probability

#### 6th Grade
- **Mean of Data Sets** S105 I will calculate the mean of a data set and use it to describe the data set.
- **Box & Whisker Plots** S123 I will make and use box plots to represent, analyze, and find the range of data.
- **Histograms** S140 I will record data in frequency tables and make and use histograms to represent and analyze data.
- **Dot/Line Plots** S225 I will make and use dot or line plots to represent and analyze data.
- **Median & Mode** S293 I will determine the median and mode of a data set and use these measures of center to describe the data set.
- **Measure of Center** S302 I will choose appropriate measures of center to describe data sets in real world and mathematical situations.
- **Mean Abs. Deviation** S536 I will calculate the mean absolute deviation of a data set and use it to describe the data set.
- **Describe Data Sets** S537 I will describe data sets and their overall shape.
7th Grade

- Compound Probability S102 I will recognize independent and dependent events and calculate the probabilities of compound events.
- Simple Probability S119 I will identify the outcomes of an event and determine the probability of an outcome represented by a ratio, fraction, decimal, or percent.
- Compare Data Sets S156 I will compare data sets by describing and summarizing the data.
- Compound Events S166 I will list the possible outcomes for compound events.
- Sampling Methods S199 I will explore and explain the validity of sampling methods.
- Predict Outcomes S219 I will interpret data to establish experimental probabilities and use probabilities to predict the outcome of an experiment.
- Random Sample Data S502 I will use data from random samples to draw inferences about a population and gauge variation in estimates or predictions using multiple samples.

8th Grade

- 2-Way Tables S503 I will make and use two-way tables to understand and interpret bivariate data.

Algebra 1

- Relative Frequencies S562 I will interpret relative frequencies in two-way tables in the context of the data and recognize possible associations and trends in the data.
- Standard Deviation S565 I will find the standard deviation of a data set and use it to describe and compare data sets.

Enrichment

- Venn Diagrams S118 I will make and use Venn diagrams to represent and analyze data.
- Interpret Graphs S135 I will read and interpret different types of graphs.
- Stem & Leaf Plots S163 I will make and use stem and leaf plots to represent and analyze data.
- Possible Outcomes S234 I will understand and use the fundamental counting principle.
- Misleading Stats S251 I will identify and explain misleading statistics and graphs.
- Circle Graphs S266 I will make and use circle graphs to represent and analyze data.
- Perms & Combs S374 I will determine the number of possible combinations and permutations of a set of items.
- Probability S378 I will know the definition of and use conditional probability.
- Complements of Sets S379 I will calculate the probability of an event and its complement.
- Probability S380 I will calculate the probability of a series of independent events, two mutually exclusive events, or two events that are not mutually exclusive.