# Grade 7–8 | Mathematics Standards of Learning for Virginia Public Schools (2023) Correlation to *Eureka Math²® (2027)*

*Eureka Math²* is a research-proven math curriculum that empowers teachers to center instructional techniques on student success. Teachers can foster more "aha!" learning moments by providing the support needed for all learners to build a more confident math mindset.

This *Eureka Math²* edition builds on a strong foundation of effective instruction. It provides teachers with guidance on delivering rigorous instruction that honors student choice and encourages confident problem-solving.

*Eureka Math²* carefully sequences mathematical content to maximize vertical alignment from kindergarten through high school. This kind of sequencing has proven to be essential in students' mastery of math.

## Teachability

*Eureka Math²* employs streamlined materials that allow teachers to plan more efficiently and focus their energy on delivering high-quality instruction that meets the individual needs of their students. Differentiation suggestions, slide decks, digital interactives, and multiple forms of assessment are just a few of the resources built into the teacher materials.

## Accessibility

*Eureka Math²* incorporates Universal Design for Learning (UDL) principles so all learners can access the mathematics and take on challenging math concepts. UDL, Differentiation, and Multilingual Learner supports are built into the instructional design and are clearly identified in the *Teach* book.

The curriculum also carries a focus on readability. By eliminating unnecessary words and using clear sentences, the *Eureka Math²* teacher–writers have created one of the most readable mathematics curricula on the market. The curriculum's readability and accessibility help all students see themselves as mathematical thinkers and doers who are fully capable of owning their mathematics learning.

## Math Confidence

*Eureka Math²* fosters a classroom culture of learning by encouraging student-led discourse and cognitive engagement that results in confident learners. By leveraging consistent models, routines, and progressions, teachers can remove barriers and allow all students an avenue to success. Within the digital platform, each grade includes wordless videos and digital interactives that spark students' curiosity and help them make conceptual connections. Using the *Learn* books, students wonder, explore, and make sense of mathematics, which helps them develop a strong, positive mathematical identity.

| Mathematical Process Goals for Students | Aligned Components of *Eureka Math²* |
|---|---|
| **Mathematical Problem Solving** | Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson. |
| **Mathematical Communication** | Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson. |
| **Mathematical Reasoning** | Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson. |
| **Mathematical Connections** | Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson. |
| **Mathematical Representations** | Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson. |

## Number and Number Sense

**7.NS.1 The student will investigate and describe the concept of exponents for powers of ten and compare and order numbers greater than zero written in scientific notation.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.NS.1.a**<br>Investigate and describe powers of $10$ with negative exponents by examining patterns. | 7–8 M1 Lesson 11: Products of Exponential Expressions with Positive Whole-Number Exponents<br>7–8 M1 Lesson 12: More Properties of Exponents<br>7–8 M1 Lesson 13: Making Sense of Integer Exponents |
| **7.NS.1.b**<br>Represent a power of $10$ with a negative exponent in fraction and decimal form. | 7–8 M1 Lesson 11: Products of Exponential Expressions with Positive Whole-Number Exponents<br>7–8 M1 Lesson 12: More Properties of Exponents<br>7–8 M1 Lesson 13: Making Sense of Integer Exponents |
| **7.NS.1.c**<br>Convert between numbers greater than $0$ written in scientific notation and decimals. | 7–8 M1 Lesson 10: Large and Small Positive Numbers<br>7–8 M1 Lesson 14: Writing Very Large and Very Small Numbers in Scientific Notation<br>7–8 M1 Lesson 15: Operations with Numbers Written in Scientific Notation<br>7–8 M1 Lesson 16: Applications with Numbers Written in Scientific Notation<br>7–8 M1 Lesson 17: Get to the Point |
| **7.NS.1.d**<br>Compare and order no more than four numbers greater than $0$ written in scientific notation. Ordering may be in ascending or descending order. | 7–8 M1 Lesson 10: Large and Small Positive Numbers<br>7–8 M1 Lesson 14: Writing Very Large and Very Small Numbers in Scientific Notation |

## Number and Number Sense

**7.NS.2 The student will reason and use multiple strategies to compare and order rational numbers.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.NS.2.a**<br>Use multiple strategies (e.g., benchmarks, number line, equivalency) to compare (using symbols $<$, $>$, $=$) and order (a set of no more than four) rational numbers expressed as integers, fractions (proper or improper), mixed numbers, decimals, and percents. Fractions and mixed numbers may be positive or negative. Decimals may be positive or negative and are limited to the thousandths place. Ordering may be in ascending or descending order. Justify solutions orally, in writing or with a model. | 7 M2 Lesson 18: Understanding Negative Divisors<br>7 M2 Lesson 21: Comparing and Ordering Rational Numbers |

## Number and Number Sense

**7.NS.3 The student will recognize and describe the relationship between square roots and perfect squares.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.NS.3.a**<br>Determine the positive square root of a perfect square from 0 to 400. | 8 M1 Lesson 16: Perfect Squares and Perfect Cubes<br>7–8 M1 Lesson 18: Solving Equations with Squares and Cubes<br>7–8 M1 Lesson 19: The Pythagorean Theorem<br>7–8 M1 Lesson 20: Using the Pythagorean Theorem<br>7–8 M1 Lesson 23: Revisiting Equations with Squares and Cubes |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.NS.3.b**<br>Describe the relationship between square roots and perfect squares. | 8 M1 Lesson 16: Perfect Squares and Perfect Cubes<br>7–8 M1 Lesson 18: Solving Equations with Squares and Cubes<br>7–8 M1 Lesson 19: The Pythagorean Theorem<br>7–8 M1 Lesson 20: Using the Pythagorean Theorem<br>7–8 M1 Lesson 23: Revisiting Equations with Squares and Cubes |

## Computation and Estimation

**7.CE.1 The student will estimate, solve, and justify solutions to multistep contextual problems involving operations with rational numbers.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.CE.1.a**<br>Estimate, solve, and justify solutions to contextual problems involving addition, subtraction, multiplication, and division with rational numbers expressed as integers, fractions (proper or improper), mixed numbers, and decimals. Fractions may be positive or negative. Decimals may be positive or negative and are limited to the thousandths place. | 7 M2 Lesson 25: Writing and Evaluating Expressions with Rational Numbers, Part 1<br>7 M2 Lesson 26: Writing and Evaluating Expressions with Rational Numbers, Part 2<br>7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 17: Using Proportional Reasoning to Solve Multi-Step Problems |

## Computation and Estimation

**7.CE.2 The student will solve problems, including those in context, involving proportional relationships.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.CE.2.a**<br>Given a proportional relationship between two quantities, create and use a ratio table to determine missing values. | 7–8 M2 Lesson 12: An Experiment with Ratios and Rates<br>7–8 M2 Lesson 13: Exploring Tables of Proportional Relationships<br>7–8 M2 Lesson 14: Exploring Graphs of Proportional Relationships<br>7–8 M2 Lesson 19: Proportional Reasoning and Percents |
| **7.CE.2.b**<br>Write and solve a proportion that represents a proportional relationship between two quantities to find a missing value, including problems in context. | 7–8 M2 Lesson 13: Exploring Tables of Proportional Relationships<br>7–8 M2 Lesson 15: Relating Representations of Proportional Relationships<br>7–8 M2 Lesson 16: Applying Proportional Reasoning<br>7–8 M2 Lesson 17: Using Proportional Reasoning to Solve Multi-Step Problems<br>7–8 M2 Lesson 18: Handstand Sprint<br>7–8 M2 Lesson 19: Proportional Reasoning and Percents |
| **7.CE.2.c**<br>Apply proportional reasoning to solve problems in context, including converting units of measurement, when given the conversion factor. | 7–8 M2 Lesson 13: Exploring Tables of Proportional Relationships<br>7–8 M2 Lesson 15: Relating Representations of Proportional Relationships<br>7–8 M2 Lesson 16: Applying Proportional Reasoning<br>7–8 M2 Lesson 17: Using Proportional Reasoning to Solve Multi-Step Problems<br>7–8 M2 Lesson 18: Handstand Sprint<br>7–8 M2 Lesson 19: Proportional Reasoning and Percents |
| **7.CE.2.d**<br>Estimate and determine the percentage of a given whole number, including but not limited to the use of benchmark percentages. | 6 M1 Lesson 22: Introduction to Percents<br>6 M1 Lesson 23: Finding the Percent<br>6 M1 Lesson 24: Finding a Part<br>6 M1 Lesson 25: Finding the Whole<br>6 M1 Lesson 26: Solving Percent Problems |

## Measurement and Geometry

**7.MG.1 The student will investigate and determine the volume formula for right cylinders and the surface area formulas for rectangular prisms and right cylinders and apply the formulas in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.1.a**<br>Develop the formulas for determining the volume of right cylinders and solve problems, including those in contextual situations, using concrete objects, diagrams, and formulas. | 7–8 M5 Lesson 17: Volume of Cylinders<br>7–8 M5 Lesson 23: Applications of Volume |
| **7.MG.1.b**<br>Develop the formulas for determining the surface area of rectangular prisms and right cylinders and solve problems, including those in contextual situations, using concrete objects, two-dimensional diagrams, nets, and formulas. | 7–8 M5 Lesson 11: Surface Areas of Prisms and Pyramids<br>7–8 M5 Lesson 12: Surface Areas of Cylinders |
| **7.MG.1.c**<br>Determine if a problem in context, involving a rectangular prism or right cylinder, represents the application of volume or surface area. | 7–8 M5 Lesson 11: Surface Areas of Prisms and Pyramids<br>7–8 M5 Lesson 16: Volume of Prisms<br>7–8 M5 Lesson 18: Designing a Fish Tank<br>*Supplemental material is necessary to address problems involving cylinders.* |
| **7.MG.1.d**<br>Describe how the volume of a rectangular prism is affected when one measured attribute is multiplied by a factor of $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, 2, 3, or 4, including those in contextual situations. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.1.e**<br>Describe how the surface area of a rectangular prism is affected when one measured attribute is multiplied by a factor of $\frac{1}{2}$ or $2$, including those in contextual situations. | *Supplemental material is necessary to address this standard.* |

## Measurement and Geometry

**7.MG.2 The student will solve problems and justify relationships of similarity using proportional reasoning.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.2.a**<br>Identify corresponding congruent angles of similar quadrilaterals and triangles, through the use of geometric markings. | 7–8 M3 Lesson 28: Exploring Angles in Similar Triangles<br>*Supplemental material is necessary to address similar quadrilaterals.* |
| **7.MG.2.b**<br>Identify corresponding sides of similar quadrilaterals and triangles. | 7–8 M3 Lesson 27: Similar Figures<br>7–8 M3 Lesson 28: Exploring Angles in Similar Triangles |
| **7.MG.2.c**<br>Given two similar quadrilaterals or triangles, write similarity statements using symbols. | 7–8 M3 Lesson 27: Similar Figures<br>7–8 M3 Lesson 28: Exploring Angles in Similar Triangles<br>*Supplemental material is necessary to address similar quadrilaterals.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.2.d**<br>Write proportions to express the relationships between the lengths of corresponding sides of similar quadrilaterals and triangles. | 7–8 M3 Lesson 29: Using Similar Figures to Find Unknown Side Lengths<br>*Supplemental material is necessary to address similar quadrilaterals.* |
| **7.MG.2.e**<br>Recognize and justify if two quadrilaterals or triangles are similar using the ratios of corresponding side lengths. | 7–8 M3 Lesson 27: Similar Figures<br>7–8 M3 Lesson 28: Exploring Angles in Similar Triangles<br>*Supplemental material is necessary to address similar quadrilaterals.* |
| **7.MG.2.f**<br>Solve a proportion to determine a missing side length of similar quadrilaterals or triangles. | 7–8 M3 Lesson 29: Using Similar Figures to Find Unknown Side Lengths<br>*Supplemental material is necessary to address similar quadrilaterals.* |
| **7.MG.2.g**<br>Given angle measures in a quadrilateral or triangle, determine unknown angle measures in a similar quadrilateral or triangle. | 7–8 M3 Lesson 28: Exploring Angles in Similar Triangles<br>*Supplemental material is necessary to address similar quadrilaterals.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.2.h**<br>Apply proportional reasoning to solve problems in context including scale drawings. Scale factors shall have denominators no greater than 12 and decimals no less than tenths. | 7–8 M3 Lesson 18: Scale Drawings<br>7–8 M3 Lesson 19: Finding Actual Distances from a Scale Drawing<br>7–8 M3 Lesson 20: Scale and Scale Factor<br>7–8 M3 Lesson 21: Modeling with Scale Drawings<br>7–8 M3 Lesson 22: Dilations<br>7–8 M3 Lesson 25: The Shadowy Hand |

## Measurement and Geometry

**7.MG.3 The student will compare and contrast quadrilaterals based on their properties and determine unknown side lengths and angle measures of quadrilaterals.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.3.a**<br>Compare and contrast properties of the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid: | *Supplemental material is necessary to completely address this standard.* |
| **7.MG.3.a.i**<br>parallel/perpendicular sides and diagonals; | 7–8 M3 Lesson 1: Sketching and Constructing Geometric Figures<br>*Supplemental material is necessary to fully address this standard.* |
| **7.MG.3.a.ii**<br>congruence of angle measures, side, and diagonal lengths; and | 7–8 M3 Lesson 1: Sketching and Constructing Geometric Figures<br>*Supplemental material is necessary to fully address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.3.a.iii**<br>lines of symmetry. | *Supplemental material is necessary to address this standard.* |
| **7.MG.3.b**<br>Sort and classify quadrilaterals as parallelograms, rectangles, trapezoids, rhombi, and/or squares based on their properties: | *Supplemental material is necessary to address this standard.* |
| **7.MG.3.b.i**<br>parallel/perpendicular sides and diagonals; | 7–8 M3 Lesson 1: Sketching and Constructing Geometric Figures<br>*Supplemental material is necessary to fully address this standard.* |
| **7.MG.3.b.ii**<br>congruence of angle measures, side, and diagonal lengths; and | 7–8 M3 Lesson 1: Sketching and Constructing Geometric Figures<br>*Supplemental material is necessary to fully address this standard.* |
| **7.MG.3.b.iii**<br>lines of symmetry. | *Supplemental material is necessary to address this standard.* |
| **7.MG.3.c**<br>Given a diagram, determine an unknown angle measure in a quadrilateral, using properties of quadrilaterals. | *Supplemental material is necessary to address this standard.* |
| **7.MG.3.d**<br>Given a diagram, determine an unknown side length in a quadrilateral using properties of quadrilaterals. | *Supplemental material is necessary to address this standard.* |

## Measurement and Geometry

**7.MG.4 The student will apply dilations of polygons in the coordinate plane.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.MG.4.a**<br>Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been dilated. Scale factors are limited to $\frac{1}{4}$, $\frac{1}{2}$, 2, 3, or 4. The center of the dilation will be the origin. | 7–8 M3 Lesson 26: Dilations on the Coordinate Plane |
| **7.MG.4.b**<br>Sketch the image of a dilation of a polygon limited to a scale factor of $\frac{1}{4}$, $\frac{1}{2}$, 2, 3, or 4. The center of the dilation will be the origin. | 7–8 M3 Lesson 26: Dilations on the Coordinate Plane |
| **7.MG.4.c**<br>Identify and describe dilations in context including, but not limited to, scale drawings and graphic design. | 7–8 M3 Lesson 18: Scale Drawings<br>7–8 M3 Lesson 19: Finding Actual Distances from a Scale Drawing<br>7–8 M3 Lesson 20: Scale and Scale Factor<br>7–8 M3 Lesson 21: Modeling with Scale Drawings<br>7–8 M3 Lesson 22: Dilations |

## Probability and Statistics

**7.PS.1 The student will use statistical investigation to determine the probability of an event and investigate and describe the difference between the experimental and theoretical probability.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PS.1.a**<br>Determine the theoretical probability of an event. | 7–8 M6 Lesson 3: Theoretical Probability |
| **7.PS.1.b**<br>Given the results of a statistical investigation, determine the experimental probability of an event. | 7–8 M6 Lesson 1: What Is Probability?<br>7–8 M6 Lesson 2: Outcomes of Chance Experiments<br>7–8 M6 Lesson 5: Outcomes That Are Not Equally Likely<br>7–8 M6 Lesson 6: The Law of Large Numbers<br>7–8 M6 Lesson 7: Picking Blue |
| **7.PS.1.c**<br>Describe changes in the experimental probability as the number of trials increases. | 7–8 M6 Lesson 3: Theoretical Probability<br>7–8 M6 Lesson 6: The Law of Large Numbers<br>7–8 M6 Lesson 7: Picking Blue |
| **7.PS.1.d**<br>Investigate and describe the difference between the probability of an event found through experiment or simulation versus the theoretical probability of that same event. | 7–8 M6 Lesson 6: The Law of Large Numbers |

## Probability and Statistics

**7.PS.2 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on histograms.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PS.2.a**<br>Formulate questions that require the collection or acquisition of data with a focus on histograms. | 6 M6 Lesson 1: Posing Statistical Questions<br>6 M6 Lesson 6: Selecting a Data Display<br>6 M6 Lesson 17: Developing a Statistical Project |
| **7.PS.2.b**<br>Determine the data needed to answer a formulated question and collect the data (or acquire existing data) using various methods (e.g., observations, measurement, surveys, experiments). | 7–8 M6 Lesson 10: Populations and Samples<br>7–8 M6 Lesson 11: Selecting a Sample<br>7–8 M6 Lesson 12: Sampling Variability When Estimating a Population Mean |
| **7.PS.2.c**<br>Determine how sample size and randomness will ensure that the data collected is a sample that is representative of a larger population. | 7–8 M6 Lesson 10: Populations and Samples<br>7–8 M6 Lesson 11: Selecting a Sample<br>7–8 M6 Lesson 12: Sampling Variability When Estimating a Population Mean |
| **7.PS.2.d**<br>Organize and represent numerical data using histograms with and without the use of technology. | 6 M6 Lesson 4: Creating a Histogram<br>6 M6 Lesson 5: Comparing Data Displays<br>6 M6 Lesson 6: Selecting a Data Display<br>6 M6 Lesson 19: Comparing Data Distributions<br>6 M6 Lesson 22: Presenting Statistical Projects<br>*Supplemental material is necessary to address representing numerical data with histograms using technology.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PS.2.e**<br>Investigate and explain how using different intervals could impact the representation of the data in a histogram. | 6 M6 Lesson 4: Creating a Histogram<br>6 M6 Lesson 5: Comparing Data Displays<br>6 M6 Lesson 6: Selecting a Data Display<br>6 M6 Lesson 19: Comparing Data Distributions<br>6 M6 Lesson 22: Presenting Statistical Projects |
| **7.PS.2.f**<br>Compare data represented in histograms with the same data represented in other graphs, including but not limited to line plots (dot plots), circle graphs, and stem-and-leaf plots, and justify which graphical representation best represents the data. | 6 M6 Lesson 5: Comparing Data Displays<br>*Supplemental material is necessary to address circle graphs and stem-and-leaf plots.* |
| **7.PS.2.g**<br>Analyze data represented in histograms by making observations and drawing conclusions. Determine how histograms reveal patterns in data that cannot be easily seen by looking at the corresponding given data set. | 6 M6 Lesson 4: Creating a Histogram<br>6 M6 Lesson 5: Comparing Data Displays<br>6 M6 Lesson 6: Selecting a Data Display<br>6 M6 Lesson 19: Comparing Data Distributions<br>6 M6 Lesson 22: Presenting Statistical Projects |

## Patterns, Functions, and Algebra

**7.PFA.1 The student will investigate and analyze proportional relationships between two quantities using verbal descriptions, tables, equations in $y = mx$ form, and graphs, including problems in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.1.a**<br>Determine the slope, $m$, as the rate of change in a proportional relationship between two quantities given a table of values, graph, or contextual situation and write an equation in the form $y = mx$ to represent the direct variation relationship. Slope may include positive or negative values (slope will be limited to positive values in a contextual situation). | 7–8 M4 Lesson 4: Comparing Proportional Relationships<br>7–8 M4 Lesson 5: Proportional Relationships and Slope |
| **7.PFA.1.b**<br>Identify and describe a line with a slope that is positive, negative, or zero $(0)$, given a graph. | 7–8 M4 Lesson 5: Proportional Relationships and Slope<br>7–8 M4 Lesson 6: Slopes of Rising Lines and Falling Lines<br>7–8 M4 Lesson 7: Using Coordinates to Find Slope<br>7–8 M4 Lesson 8: Slope-Intercept Form of the Equation of a Line |
| **7.PFA.1.c**<br>Graph a line representing a proportional relationship, between two quantities given an ordered pair on the line and the slope, $m$, as rate of change. Slope may include positive or negative values. | 7–8 M4 Lesson 4: Comparing Proportional Relationships<br>7–8 M4 Lesson 5: Proportional Relationships and Slope |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.1.d**<br>Graph a line representing a proportional relationship between two quantities given the equation of the line in the form $y = mx$, where $m$ represents the slope as rate of change. Slope may include positive or negative values. | 7–8 M4 Lesson 4: Comparing Proportional Relationships<br>7–8 M4 Lesson 5: Proportional Relationships and Slope |
| **7.PFA.1.e**<br>Make connections between and among representations of a proportional relationship between two quantities using problems in context, tables, equations, and graphs. Slope may include positive or negative values (slope will be limited to positive values in a contextual situation). | 7–8 M2 Lesson 14: Exploring Graphs of Proportional Relationships<br>7–8 M2 Lesson 15: Relating Representations of Proportional Relationships<br>7–8 M2 Lesson 16: Applying Proportional Reasoning |

## Patterns, Functions, and Algebra

**7.PFA.2 The student will simplify numerical expressions, simplify and generate equivalent algebraic expressions in one variable, and evaluate algebraic expressions for given replacement values of the variables.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.2.a**<br>Use the order of operations and apply the properties of real numbers to simplify numerical expressions. Exponents are limited to $1$, $2$, $3$, or $4$ and bases are limited to positive integers. Expressions should not include braces $\{\ \}$ but may include brackets $[\ ]$ and absolute value bars $|\ |$. Square roots are limited to perfect squares. | 6 M4 Lesson 1: Expressions with Addition and Subtraction<br>6 M4 Lesson 2: Expressions with Multiplication and Division<br>6 M4 Lesson 3: Exploring Exponents<br>6 M4 Lesson 4: Evaluating Expressions with Exponents<br>6 M4 Lesson 5: Exploring Order of Operations<br>6 M4 Lesson 6: Order of Operations<br>*Supplemental material is necessary to address expressions with absolute value and square roots.* |
| **7.PFA.2.b**<br>Represent equivalent algebraic expressions in one variable using concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles). | 7 M3 Lesson 1: Equivalent Expressions<br>7 M3 Lesson 2: The Distributive Property and the Tabular Model<br>7 M3 Lesson 3: The Distributive Property and Combining Like Terms<br>7 M3 Lesson 4: Adding and Subtracting Expressions<br>7 M3 Lesson 5: Factoring Expressions<br>7 M3 Lesson 6: Comparing Expressions<br>*Supplemental material is necessary to address using concrete manipulatives.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.2.c**<br>Simplify and generate equivalent algebraic expressions in one variable by applying the order of operations and properties of real numbers. Expressions may require combining like terms to simplify. Expressions will include only linear and numeric terms. Coefficients and numeric terms may be positive or negative rational numbers. | 7 M3 Lesson 1: Equivalent Expressions<br>7 M3 Lesson 2: The Distributive Property and the Tabular Model<br>7 M3 Lesson 3: The Distributive Property and Combining Like Terms<br>7 M3 Lesson 4: Adding and Subtracting Expressions<br>7 M3 Lesson 5: Factoring Expressions<br>7 M3 Lesson 6: Comparing Expressions<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations |
| **7.PFA.2.d**<br>Use the order of operations and apply the properties of real numbers to evaluate algebraic expressions for given replacement values of the variables. Exponents are limited to $1, 2, 3,$ or $4$ and bases are limited to positive integers. Expressions should not include braces $\{\ \}$ but may include brackets $[\ ]$ and absolute value bars $|\ |$. Square roots are limited to perfect squares. Limit the number of replacements to no more than three per expression. Replacement values may be positive or negative rational numbers. | 7 M3 Lesson 4: Adding and Subtracting Expressions |

## Patterns, Functions, and Algebra

**7.PFA.3 The student will write and solve two-step linear equations in one variable, including problems in context, that require the solution of a two-step linear equation in one variable.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.3.a**<br>Represent and solve two-step linear equations in one variable using a variety of concrete materials and pictorial representations. | *Supplemental material is necessary to address this standard.* |
| **7.PFA.3.b**<br>Apply properties of real numbers and properties of equality to solve two-step linear equations in one variable. Coefficients and numeric terms will be rational. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 3: Solving Equations<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.3.c**<br>Confirm algebraic solutions to linear equations in one variable. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 3: Solving Equations<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.3.d**<br>Write a two-step linear equation in one variable to represent a verbal situation, including those in context. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 3: Solving Equations<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.3.e**<br>Create a verbal situation in context given a two-step linear equation in one variable. | *Supplemental material is necessary to address this standard.* |
| **7.PFA.3.f**<br>Solve problems in context that require the solution of a two-step linear equation. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 3: Solving Equations<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |

## Patterns, Functions, and Algebra

**7.PFA.4 The student will write and solve one- and two-step linear inequalities in one variable, including problems in context, that require the solution of a one- and two-step linear inequality in one variable.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.4.a**<br>Apply properties of real numbers and the addition, subtraction, multiplication, and division properties of inequality to solve one- and two-step inequalities in one variable. Coefficients and numeric terms will be rational. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.4.b**<br>Investigate and explain how the solution set of a linear inequality is affected by multiplying or dividing both sides of the inequality statement by a rational number less than zero. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.4.c**<br>Represent solutions to one- or two-step linear inequalities in one variable algebraically and graphically using a number line. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.4.d**<br>Write one- or two-step linear inequalities in one variable to represent a verbal situation, including those in context. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **7.PFA.4.e**<br>Create a verbal situation in context given a one- or two-step linear inequality in one variable. | *Supplemental material is necessary to address this standard.* |
| **7.PFA.4.f**<br>Solve problems in context that require the solution of a one- or two-step inequality. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.4.g**<br>Identify a numerical value(s) that is part of the solution set of as given one- or two-step linear inequality in one variable. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |
| **7.PFA.4.h**<br>Describe the differences and similarities between solving linear inequalities in one variable and linear equations in one variable. | 7–8 M2 Lesson 4: Using Equations to Solve Inequalities<br>7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities |

## Number and Number Sense

**8.NS.1 The student will compare and order real numbers and determine the relationships between real numbers.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.NS.1.a**<br>Estimate and identify the two consecutive natural numbers between which the positive square root of a given number lies and justify which natural number is the better approximation. Numbers are limited to natural numbers from $1$ to $400$. | 7–8 M1 Lesson 20: Using the Pythagorean Theorem |
| **8.NS.1.b**<br>Use rational approximations (to the nearest hundredth) of irrational numbers to compare, order, and locate values on a number line. Radicals may include both positive and negative square roots of values from $0$ to $400$ yielding an irrational number. | 7–8 M1 Lesson 21: Approximating Values of Roots<br>7–8 M1 Lesson 22: Rational and Irrational Numbers |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.NS.1.c**<br>Use multiple strategies (e.g., benchmarks, number line, equivalency) to compare and order no more than five real numbers expressed as integers, fractions (proper or improper), decimals, mixed numbers, percents, numbers written in scientific notation, radicals, and $\pi$. Radicals may include both positive and negative square roots of values from $0$ to $400$. Ordering may be in ascending or descending order. Justify solutions orally, in writing or with a model. | 7–8 M1 Lesson 21: Approximating Values of Roots<br>7–8 M1 Lesson 22: Rational and Irrational Numbers<br>*Supplemental material is necessary to address negative square roots and comparisons that include numbers written as percents or in scientific notation.* |

## Number and Number Sense

**8.NS.2 The student will investigate and describe the relationship between the subsets of the real number system.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.NS.2.a**<br>Describe and illustrate the relationships among the subsets of the real number system by using representations (e.g., graphic organizers, number lines). Subsets include rational numbers, irrational numbers, integers, whole numbers, and natural numbers. | 7–8 M1 Lesson 18: Solving Equations with Squares and Cubes<br>7–8 M1 Lesson 19: The Pythagorean Theorem<br>7–8 M1 Lesson 20: Using the Pythagorean Theorem<br>7–8 M1 Lesson 21: Approximating Values of Roots<br>7–8 M1 Lesson 22: Rational and Irrational Numbers<br>7–8 M1 Lesson 23: Revisiting Equations with Squares and Cubes<br>7–8 M2 Lesson 6: Expressing Repeating Decimals as Fractions<br>*Supplemental material is necessary to address using representations such as graphic organizers to illustrate the relationships among the subsets of the real number system.* |
| **8.NS.2.b**<br>Classify and explain why a given number is a member of a particular subset or subsets of the real number system. | 7–8 M1 Lesson 20: Using the Pythagorean Theorem<br>7–8 M1 Lesson 22: Rational and Irrational Numbers<br>7–8 M1 Lesson 23: Revisiting Equations with Squares and Cubes<br>7–8 M2 Lesson 6: Expressing Repeating Decimals as Fractions<br>*Supplemental material is necessary to address the subsets of rational numbers.* |
| **8.NS.2.c**<br>Describe each subset of the set of real numbers and include examples and non-examples. | 7–8 M1 Lesson 20: Using the Pythagorean Theorem<br>7–8 M1 Lesson 22: Rational and Irrational Numbers<br>7–8 M1 Lesson 23: Revisiting Equations with Squares and Cubes<br>7–8 M2 Lesson 6: Expressing Repeating Decimals as Fractions<br>*Supplemental material is necessary to address the subsets of rational numbers.* |

## Computation and Estimation

**8.CE.1 The student will estimate and apply proportional reasoning and computational procedures to solve contextual problems.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.CE.1.a**<br>Estimate and solve contextual problems that require the computation of one discount or markup and the resulting sale price. | 7–8 M2 Lesson 21: Discount, Markup, Sales Tax, and Tip<br>7–8 M2 Lesson 22: Percent Increase and Percent Decrease<br>7–8 M2 Lesson 23: What Is the Best Deal? |
| **8.CE.1.b**<br>Estimate and solve contextual problems that require the computation of the sales tax, tip and resulting total. | 7–8 M2 Lesson 20: Commissions, Fees, and Taxes<br>7–8 M2 Lesson 21: Discount, Markup, Sales Tax, and Tip<br>7–8 M2 Lesson 22: Percent Increase and Percent Decrease<br>7–8 M2 Lesson 23: What Is the Best Deal? |
| **8.CE.1.c**<br>Estimate and solve contextual problems that require the computation of the percent increase or decrease. | 7–8 M2 Lesson 22: Percent Increase and Percent Decrease |

## Measurement and Geometry

**8.MG.1 The student will use the relationships among pairs of angles that are vertical angles, adjacent angles, supplementary angles, and complementary angles to determine the measure of unknown angles.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.1.a**<br>Identify and describe the relationship between pairs of angles that are vertical, adjacent, supplementary, and complementary. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 7: Solving Multi-Step Equations |
| **8.MG.1.b**<br>Use the relationships among supplementary, complementary, vertical, and adjacent angles to solve problems, including those in context, involving the measure of unknown angles. | 7–8 M2 Lesson 1: Finding Unknown Angle Measures<br>7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations<br>7–8 M2 Lesson 7: Solving Multi-Step Equations |

## Measurement and Geometry

**8.MG.2 The student will investigate and determine the surface area of square-based pyramids and the volume of cones and square-based pyramids.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.2.a**<br>Determine the surface area of square-based pyramids by using concrete objects, nets, diagrams, and formulas. | 7–8 M5 Lesson 11: Surface Areas of Prisms and Pyramids |
| **8.MG.2.b**<br>Determine the volume of cones and square-based pyramids, using concrete objects, diagrams, and formulas. | 7–8 M5 Lesson 19: Volumes of Pyramids and Cones<br>7–8 M5 Lesson 23: Applications of Volume |
| **8.MG.2.c**<br>Examine and explain the relationship between the volume of cones and cylinders, and the volume of rectangular prisms and square-based pyramids. | 7–8 M5 Lesson 19: Volumes of Pyramids and Cones |
| **8.MG.2.d**<br>Solve problems in context involving volume of cones and square-based pyramids and the surface area of square-based pyramids. | 7–8 M5 Lesson 11: Surface Areas of Prisms and Pyramids<br>7–8 M5 Lesson 19: Volumes of Pyramids and Cones<br>7–8 M5 Lesson 23: Applications of Volume |

## Measurement and Geometry

**8.MG.3 The student will apply translations and reflections to polygons in the coordinate plane.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.3.a**<br>Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been translated vertically, horizontally, or a combination of both. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane |
| **8.MG.3.b**<br>Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been reflected over the $x$- or $y$-axis. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane |
| **8.MG.3.c**<br>Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been translated and reflected over the $x$- or $y$-axis or reflected over the $x$- or $y$-axis and then translated. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane<br>7–8 M3 Lesson 10: Sequencing the Rigid Motions |
| **8.MG.3.d**<br>Sketch the image of a polygon that has been translated vertically, horizontally, or a combination of both. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.3.e**<br>Sketch the image of a polygon that has been reflected over the $x$- or $y$-axis. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane |
| **8.MG.3.f**<br>Sketch the image of a polygon that has been translated and reflected over the $x$- or $y$-axis, or reflected over the $x$- or $y$-axis and then translated. | 7–8 M3 Lesson 9: Rigid Motions on the Coordinate Plane<br>7–8 M3 Lesson 10: Sequencing the Rigid Motions |
| **8.MG.3.g**<br>Identify and describe transformations in context (e.g., tiling, fabric, wallpaper designs, art). | Math 1 M4 Lesson 15: Designs with Rigid Motions |

## Measurement and Geometry

**8.MG.4 The student will apply the Pythagorean Theorem to solve problems involving right triangles, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.4.a**<br>Verify the Pythagorean Theorem using diagrams, concrete materials, and measurement. | 7–8 M3 Lesson 15: Proving the Pythagorean Theorem<br>7–8 M3 Lesson 16: Proving the Converse of the Pythagorean Theorem |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.4.b**<br>Determine whether a triangle is a right triangle given the measures of its three sides. | 7–8 M3 Lesson 16: Proving the Converse of the Pythagorean Theorem |
| **8.MG.4.c**<br>Identify the parts of a right triangle (the hypotenuse and the legs) given figures in various orientations. | 7–8 M1 Lesson 19: The Pythagorean Theorem<br>7–8 M3 Lesson 16: Proving the Converse of the Pythagorean Theorem<br>7–8 M3 Lesson 17: Applications of the Pythagorean Theorem |
| **8.MG.4.d**<br>Determine the measure of a side of a right triangle, given the measures of the other two sides. | 7–8 M1 Lesson 19: The Pythagorean Theorem<br>7–8 M3 Lesson 17: Applications of the Pythagorean Theorem |
| **8.MG.4.e**<br>Apply the Pythagorean Theorem, and its converse, to solve problems involving right triangles in context. | 7–8 M3 Lesson 17: Applications of the Pythagorean Theorem<br>7–8 M3 Lesson 29: Using Similar Figures to Find Unknown Side Lengths<br>7–8 M5 Lesson 19: Volumes of Pyramids and Cones |

## Measurement and Geometry

**8.MG.5 The student will solve area and perimeter problems involving composite plane figures, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.MG.5.a**<br>Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, circles, and semicircles. Determine the area of subdivisions and combine to determine the area of the composite plane figure. | 7 M4 Lesson 14: Composite Figures with Circular Regions<br>7 M4 Lesson 16: Solving Area Problems by Composition and Decomposition<br>7–8 M3 Lesson 6: Watering a Lawn |
| **8.MG.5.b**<br>Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, and semicircles. Use the attributes of the subdivisions to determine the perimeter of the composite plane figure. | 7 M4 Lesson 14: Composite Figures with Circular Regions<br>*Supplemental material is necessary to fully address this standard.* |
| **8.MG.5.c**<br>Apply perimeter, circumference, and area formulas to solve contextual problems involving composite plane figures. | 7 M4 Lesson 14: Composite Figures with Circular Regions<br>7 M4 Lesson 16: Solving Area Problems by Composition and Decomposition<br>7–8 M3 Lesson 6: Watering a Lawn |

## Probability and Statistics

**8.PS.1 The student will use statistical investigation to determine the probability of independent and dependent events, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.1.a**<br>Determine whether two events are independent or dependent and explain how replacement impacts the probability. | *Supplemental material is necessary to address this standard.* |
| **8.PS.1.b**<br>Compare and contrast the probability of independent and dependent events. | *Supplemental material is necessary to address this standard.* |
| **8.PS.1.c**<br>Determine the probability of two independent events. | 7–8 M6 Lesson 3: Theoretical Probability<br>7–8 M6 Lesson 4: Multistage Experiments |
| **8.PS.1.d**<br>Determine the probability of two dependent events. | *Supplemental material is necessary to address this standard.* |

## Probability and Statistics

**8.PS.2 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on boxplots.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.2.a**<br>Formulate questions that require the collection or acquisition of data with a focus on boxplots. | A1 M1 Lesson 21: Using Center to Compare Data Distributions<br>A1 M1 Lesson 23: Estimating Variability in Data Distributions<br>*Supplemental material is necessary to fully address a focus on boxplots.* |
| **8.PS.2.b**<br>Determine the data needed to answer a formulated question and collect the data (or acquire existing data) using various methods (e.g., observations, measurement, surveys, experiments). | 7–8 M6 Lesson 11: Selecting a Sample<br>7–8 M6 Lesson 12: Sampling Variability When Estimating a Population Mean<br>A1 M1 Lesson 19: Distributions and Their Shapes |
| **8.PS.2.c**<br>Determine how statistical bias might affect whether the data collected from the sample is representative of the larger population. | 7–8 M6 Lesson 10: Populations and Samples<br>7–8 M6 Lesson 11: Selecting a Sample<br>7–8 M6 Lesson 12: Sampling Variability When Estimating a Population Mean |
| **8.PS.2.d**<br>Organize and represent a numeric data set of no more than 20 items, using boxplots, with and without the use of technology. | A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.2.e**<br>Identify and describe the lower extreme (minimum), upper extreme (maximum), median, upper quartile, lower quartile, range, and interquartile range given a data set, represented by a boxplot. | A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |
| **8.PS.2.f**<br>Describe how the presence of an extreme data point (outlier) affects the shape and spread of the data distribution of a boxplot. | A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |
| **8.PS.2.g**<br>Analyze data represented in a boxplot by making observations and drawing conclusions. | A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |
| **8.PS.2.h**<br>Compare and analyze two data sets represented in boxplots. | A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |
| **8.PS.2.i**<br>Given a contextual situation, justify which graphical representation (e.g., pictographs, bar graphs, line graphs, line plots/dot plots, stem-and-leaf plots, circle graphs, histograms, and boxplots) best represents the data. | 8 Data Investigation: Obstacles to Leisure Reading<br>8 Data Investigation: US Presidents<br>8 Data Investigation: Crash Impact<br>A1 M1 Lesson 19: Distributions and Their Shapes<br>A1 M1 Lesson 20: Describing the Center of a Distribution<br>A1 M1 Lesson 21: Using Center to Compare Data Distributions |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.2.j**<br>Identify components of graphical displays that can be misleading. | *Supplemental material is necessary to address this standard.* |

## Probability and Statistics

**8.PS.3 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on scatterplots.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.3.a**<br>Formulate questions that require the collection or acquisition of data with a focus on scatterplots. | 7–8 M6 Lesson 18: Scatter Plots |
| **8.PS.3.b**<br>Determine the data needed to answer a formulated question and collect the data (or acquire existing data) of no more than 20 items using various methods (e.g., observations, measurement, surveys, experiments). | 7–8 M6 Lesson 18: Scatter Plots |
| **8.PS.3.c**<br>Organize and represent numeric bivariate data using scatterplots with and without the use of technology. | 7–8 M6 Lesson 18: Scatter Plots<br>7–8 M6 Lesson 19: Patterns in Scatter Plots |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PS.3.d**<br>Make observations about a set of data points in a scatterplot as having a positive linear relationship, a negative linear relationship, or no relationship. | 7–8 M6 Lesson 18: Scatter Plots<br>7–8 M6 Lesson 19: Patterns in Scatter Plots |
| **8.PS.3.e**<br>Analyze and justify the relationship of the quantitative bivariate data represented in scatterplots. | 7–8 M6 Lesson 18: Scatter Plots<br>7–8 M6 Lesson 19: Patterns in Scatter Plots |
| **8.PS.3.f**<br>Sketch the line of best fit for data represented in a scatterplot. | 7–8 M6 Lesson 20: Informally Fitting a Line to Data<br>7–8 M6 Lesson 21: Linear Models |

## Patterns, Functions, and Algebra

**8.PFA.1 The student will represent, simplify, and generate equivalent algebraic expressions in one variable.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.1.a**<br>Represent algebraic expressions using concrete manipulatives or pictorial representations (e.g., colored chips, algebra tiles), including expressions that apply the distributive property. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.1.b**<br>Simplify and generate equivalent algebraic expressions in one variable by applying the order of operations and properties of real numbers. Expressions may need to be expanded (using the distributive property) or require combining like terms to simplify. Expressions will include only linear and numeric terms. Coefficients and numeric terms may be rational. | 7–8 M2 Lesson 2: Using Equivalent Expressions to Solve Equations |

## Patterns, Functions, and Algebra

**8.PFA.2 The student will determine whether a given relation is a function and determine the domain and range of a function.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.2.a**<br>Determine whether a relation, represented by a set of ordered pairs, a table, or a graph of discrete points is a function. Sets are limited to no more than 10 ordered pairs. | 7–8 M5 Lesson 1: Motion and Speed<br>7–8 M5 Lesson 2: Definition of a Function<br>7–8 M5 Lesson 4: More Examples of Functions<br>7–8 M5 Lesson 5: Graphs of Functions and Equations |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.2.b**<br>Identify the domain and range of a function represented as a set of ordered pairs, a table, or a graph of discrete points. | A1 M3 Lesson 1: The Definition of a Function<br>A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions<br>A1 M3 Lesson 3: The Graph of a Function<br>A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$<br>A1 M3 Lesson 5: Using Pseudocode to Compare Graphs of Functions and Graphs of Equations<br>A1 M3 Lesson 6: Representations of Functions |

## Patterns, Functions, and Algebra

**8.PFA.3 The student will represent and solve problems, including those in context, by using linear functions and analyzing their key characteristics (the value of the $y$-intercept ($b$) and the coordinates of the ordered pairs in graphs will be limited to integers).**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.3.a**<br>Determine how adding a constant ($b$) to the equation of a proportional relationship $y = mx$ will translate the line on a graph. | 7–8 M4 Lesson 5: Proportional Relationships and Slope<br>7–8 M4 Lesson 6: Slopes of Rising Lines and Falling Lines<br>7–8 M4 Lesson 7: Using Coordinates to Find Slope<br>7–8 M4 Lesson 8: Slope-Intercept Form of the Equation of a Line |
| **8.PFA.3.b**<br>Describe key characteristics of linear functions including slope ($m$), $y$-intercept ($b$), and independent and dependent variables. | 7–8 M5 Lesson 3: Linear Functions and Proportionality<br>7–8 M5 Lesson 6: Linear Functions and Rate of Change<br>7–8 M5 Lesson 7: Interpreting Rate of Change and Initial Value |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.3.c**<br>Graph a linear function given a table, equation, or a situation in context. | 7–8 M5 Lesson 6: Linear Functions and Rate of Change<br>7–8 M5 Lesson 7: Interpreting Rate of Change and Initial Value<br>7–8 M5 Lesson 23: Applications of Volume |
| **8.PFA.3.d**<br>Create a table of values for a linear function given a graph, equation in the form of $y = mx + b$, or context. | 7–8 M5 Lesson 6: Linear Functions and Rate of Change<br>7–8 M5 Lesson 7: Interpreting Rate of Change and Initial Value<br>7–8 M5 Lesson 23: Applications of Volume |
| **8.PFA.3.e**<br>Write an equation of a linear function in the form $y = mx + b$, given a graph, table, or a situation in context. | 7–8 M5 Lesson 6: Linear Functions and Rate of Change<br>7–8 M5 Lesson 7: Interpreting Rate of Change and Initial Value<br>7–8 M5 Lesson 23: Applications of Volume |
| **8.PFA.3.f**<br>Create a context for a linear function given a graph, table, or equation in the form $y = mx + b$. | *Supplemental material is necessary to address this standard.* |

## Patterns, Functions, and Algebra

**8.PFA.4 The student will write and solve multistep linear equations in one variable, including problems in context that require the solution of a multistep linear equation in one variable.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.4.a**<br>Represent and solve multistep linear equations in one variable with the variable on one or both sides of the equation (up to four steps) using a variety of concrete materials and pictorial representations. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems<br>*Supplemental material is necessary to address using concrete materials and pictorial representations.* |
| **8.PFA.4.b**<br>Apply properties of real numbers and properties of equality to solve multistep linear equations in one variable (up to four steps). Coefficients and numeric terms will be rational. Equations may contain expressions that need to be expanded (using the distributive property) or require combining like terms to solve. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems |
| **8.PFA.4.c**<br>Write a multistep linear equation in one variable to represent a verbal situation, including those in context. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.4.d**<br>Create a verbal situation in context given a multistep linear equation in one variable. | *Supplemental material is necessary to address this standard.* |
| **8.PFA.4.e**<br>Solve problems in context that require the solution of a multistep linear equation. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems |
| **8.PFA.4.f**<br>Interpret algebraic solutions in context to linear equations in one variable. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems |
| **8.PFA.4.g**<br>Confirm algebraic solutions to linear equations in one variable. | 7–8 M2 Lesson 7: Solving Multi-Step Equations<br>7–8 M2 Lesson 8: Solving Equations with Rational Coefficients<br>7–8 M2 Lesson 9: Linear Equations with More Than One Solution<br>7–8 M2 Lesson 10: Another Possible Number of Solutions<br>7–8 M2 Lesson 11: Using Linear Equations to Solve Real-World Problems |

## Patterns, Functions, and Algebra

**8.PFA.5 The student will write and solve multistep linear inequalities in one variable, including problems in context that require the solution of a multistep linear inequality in one variable.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.5.a**<br>Apply properties of real numbers and properties of inequality to solve multistep linear inequalities (up to four steps) in one variable with the variable on one or both sides of the inequality. Coefficients and numeric terms will be rational. Inequalities may contain expressions that need to be expanded (using the distributive property) or require combining like terms to solve. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |
| **8.PFA.5.b**<br>Represent solutions to inequalities algebraically and graphically using a number line. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |
| **8.PFA.5.c**<br>Write multistep linear inequalities in one variable to represent a verbal situation, including those in context. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |
| **8.PFA.5.d**<br>Create a verbal situation in context given a multistep linear inequality in one variable. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math²* |
|---|---|
| **8.PFA.5.e**<br>Solve problems in context that require the solution of a multistep linear inequality in one variable. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |
| **8.PFA.5.f**<br>Identify a numerical value(s) that is part of the solution set of a given inequality. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |
| **8.PFA.5.g**<br>Interpret algebraic solutions in context to linear inequalities in one variable. | 7–8 M2 Lesson 5: Solving Problems Involving Equations and Inequalities<br>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable |