# Grade 6 | Mathematics Standards of Learning for Virginia Public Schools
## Correlation to *Eureka Math*®

**About *Eureka Math***

Created by Great Minds®, a mission-driven Public Benefit Corporation, *Eureka Math*® helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

**Aligned**

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

**Data**

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

**Full Suite of Resources**

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher-writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

| Mathematical Process Goals for Students | Aligned Components of *Eureka Math* |
|---|---|
| **Mathematical Problem Solving** | Lessons in every module engage students in mathematical processes. |
| **Mathematical Communication** | |
| **Mathematical Reasoning** | |
| **Mathematical Connections** | |
| **Mathematical Representations** | |

## Number and Number Sense
**6.NS.1 The student will reason and use multiple strategies to express equivalency, compare, and order numbers written as fractions, mixed numbers, decimals, and percents.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.NS.1.a**<br><br>Estimate and determine the percent represented by a given model (e.g., number line, picture, verbal description), including percents greater than 100% and less than 1%. | G6 M1 Topic D: Percent |
| **6.NS.1.b**<br><br>Represent and determine equivalencies among decimals (through the thousandths place) and percents incorporating the use of number lines, and concrete and pictorial models. | G6 M1 Lesson 3: Equivalent Ratios<br>G6 M1 Lesson 4: Equivalent Ratios<br>G6 M1 Lesson 5: Solving Problems by Finding Equivalent Ratios<br>G6 M1 Lesson 6: Solving Problems by Finding Equivalent Ratios<br>G6 M1 Lesson 7: Associated Ratios and the Value of a Ratio<br>G6 M1 Lesson 8: Equivalent Ratios Defined Through the Value of a Ratio<br>G6 M1 Topic B: Collections of Equivalent Ratios<br>G6 M1 Lesson 16: From Ratios to Rates<br>G6 M1 Lesson 17: From Rates to Ratios<br>G6 M1 Lesson 18: Finding a Rate by Dividing Two Quantities<br>G6 M1 Lesson 19: Comparison Shopping—Unit Price and Related Measurement Conversions<br>G6 M1 Lesson 20: Comparison Shopping—Unit Price and Related Measurement Conversions<br>G6 M1 Topic D: Percent |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.NS.1.c**<br><br>Represent and determine equivalencies among fractions (proper or improper) and mixed numbers that have denominators that are 12 or less or factors of 100 and percents incorporating the use of number lines, and concrete and pictorial models. | G6 M1 Lesson 3: Equivalent Ratios<br>G6 M1 Lesson 4: Equivalent Ratios<br>G6 M1 Lesson 5: Solving Problems by Finding Equivalent Ratios<br>G6 M1 Lesson 6: Solving Problems by Finding Equivalent Ratios<br>G6 M1 Lesson 7: Associated Ratios and the Value of a Ratio<br>G6 M1 Lesson 8: Equivalent Ratios Defined Through the Value of a Ratio<br>G6 M1 Topic B: Collections of Equivalent Ratios<br>G6 M1 Lesson 16: From Ratios to Rates<br>G6 M1 Lesson 17: From Rates to Ratios<br>G6 M1 Lesson 18: Finding a Rate by Dividing Two Quantities<br>G6 M1 Lesson 19: Comparison Shopping—Unit Price and Related Measurement Conversions<br>G6 M1 Lesson 20: Comparison Shopping—Unit Price and Related Measurement Conversions |
| **6.NS.1.d**<br><br>Represent and determine equivalencies among decimals, percents, fractions (proper or improper), and mixed numbers that have denominators that are 12 or less or factors of 100 incorporating the use of number lines, and concrete and pictorial models. | G6 M1 Lesson 21: Getting the Job Done—Speed, Work, and Measurement Units<br>G6 M1 Lesson 22: Getting the Job Done—Speed, Work, and Measurement Units<br>G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions |

| **Mathematics Standards of Learning for Virginia Public Schools** | **Aligned Components of *Eureka Math*** |
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| **6.NS.1.e**<br><br>Use multiple strategies (e.g., benchmarks, number line, equivalency) to compare and order no more than four positive rational numbers expressed as fractions (proper or improper), mixed numbers, decimals, and percents (decimals through thousandths, fractions with denominators of 12 or less or factors of 100) with and without models. Justify solutions orally, in writing or with a model. Ordering may be in ascending or descending order. | G6 M1 Topic D: Percent |

## Number and Number Sense
**6.NS.2 The student will reason and use multiple strategies to represent, compare, and order integers.**

| **Mathematics Standards of Learning for Virginia Public Schools** | **Aligned Components of *Eureka Math*** |
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| **6.NS.2.a**<br><br>Represent integers (e.g., number lines, concrete materials, pictorial models), including models derived from contextual situations, and identify an integer represented by a point on a number line. | G6 M3 Topic A: Understanding Positive and Negative Numbers on the Number Line |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.NS.2.b**<br><br>Compare and order integers using a number line. | G6 M3 Lesson 7: Ordering Integers and Other Rational Numbers<br><br>G6 M3 Lesson 8: Ordering Integers and Other Rational Numbers<br><br>G6 M3 Lesson 9: Comparing Integers and Other Rational Numbers |
| **6.NS.2.c**<br><br>Compare integers, using mathematical symbols ($<$, $>$, $=$). | G6 M3 Lesson 8: Ordering Integers and Other Rational Numbers<br><br>G6 M3 Lesson 11: Absolute Value—Magnitude and Distance<br><br>G6 M3 Lesson 12: The Relationship Between Absolute Value and Order<br><br>G6 M3 Lesson 13: Statements of Order in the Real World |
| **6.NS.2.d**<br><br>Identify and describe the absolute value of an integer as the distance from zero on the number line. | G6 M3 Lesson 8: Ordering Integers and Other Rational Numbers<br><br>G6 M3 Lesson 11: Absolute Value—Magnitude and Distance<br><br>G6 M3 Lesson 12: The Relationship Between Absolute Value and Order<br><br>G6 M3 Lesson 13: Statements of Order in the Real World |

## Number and Number Sense

**6.NS.3 The student will recognize and represent patterns with whole number exponents and perfect squares.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.NS.3.a**<br><br>Recognize and represent patterns with bases and exponents that are whole numbers. | G6 M4 Topic B: Special Notations of Operations<br><br>G6 M4 Lesson 16: Write Expressions in Which Letters Stand for Numbers |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.NS.3.b**<br><br>Recognize and represent patterns of perfect squares not to exceed $20^2$, by using concrete and pictorial models. | G6 M4 Topic B: Special Notations of Operations<br><br>G6 M4 Lesson 16: Write Expressions in Which Letters Stand for Numbers |
| **6.NS.3.c**<br><br>Justify if a number between $0$ and $400$ is a perfect square through modeling or mathematical reasoning. | *Supplemental material is necessary to address this standard.* |
| **6.NS.3.d**<br><br>Recognize and represent powers of $10$ with whole number exponents by examining patterns in place value. | G5 M1 Lesson 3: Use exponents to name place value units and explain patterns in the placement of the decimal point.<br><br>G5 M1 Lesson 4: Use exponents to denote powers of $10$ with application to metric conversions.<br><br>G5 M1 Lesson 12: Multiply a decimal fraction by single-digit whole numbers, including using estimation to confirm the placement of the decimal point.<br><br>G5 M2 Topic A: Mental Strategies for Multi-Digit Whole Number Multiplication<br><br>G5 M2 Lesson 16: Use divide by $10$ patterns for multi-digit whole number division.<br><br>G5 M2 Lesson 24: Divide decimal dividends by multiples of $10$, reasoning about the placement of the decimal point and making connections to a written method. |

## Computation and Estimation

**6.CE.1 The student will estimate, demonstrate, solve, and justify solutions to problems using operations with fractions and mixed numbers, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.CE.1.a**<br><br>Demonstrate/model multiplication and division of fractions (proper or improper) and mixed numbers using multiple representations. | G5 M4 Lesson 11: Solve and create fraction word problems involving addition, subtraction, and multiplication.<br><br>G5 M4 Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.<br><br>G5 M4 Lesson 16: Solve word problems using tape diagrams and fraction-by-fraction multiplication.<br><br>G5 M4 Lesson 24: Solve word problems using fraction and decimal multiplication.<br><br>G5 M5 Lesson 14: Solve real-world problems involving area of figures with fractional side lengths using visual models and/or equations.<br><br>G5 M5 Lesson 15: Solve real-world problems involving area of figures with fractional side lengths using visual models and/or equations.<br><br>G5 M6 Topic E: Multi-Step Word Problems<br><br>G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction |
| **6.CE.1.b**<br><br>Multiply and divide fractions (proper or improper) and mixed numbers that include denominators of $12$ or less. Answers are expressed in simplest form. | G5 M4 Topic C: Multiplication of a Whole Number by a Fraction<br><br>G5 M4 Topic E: Multiplication of a Fraction by a Fraction<br><br>G5 M4 Topic G: Division of Fractions and Decimal Fractions<br><br>G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction<br><br>G6 M2 Lesson 11: Fraction Multiplication and the Products of Decimals<br><br>*Supplemental material is necessary to address expressing answers in simplest form.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.CE.1.c**<br><br>Investigate and explain the effect of multiplying or dividing a fraction, whole number, or mixed number by a number between zero and one. | G5 M4 Topic C: Multiplication of a Whole Number by a Fraction<br><br>G5 M4 Topic E: Multiplication of a Fraction by a Fraction<br><br>G5 M4 Topic G: Division of Fractions and Decimal Fractions<br><br>G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction<br><br>G6 M2 Lesson 11: Fraction Multiplication and the Products of Decimals |
| **6.CE.1.d**<br><br>Estimate, determine, and justify the solution to single-step and multistep problems in context that involve addition and subtraction with fractions (proper or improper) and mixed numbers, with and without regrouping, that include like and unlike denominators of 12 or less. Answers are expressed in simplest form. | G4 M5 Lesson 29: Estimate sums and differences using benchmark numbers.<br><br>G5 M3 Lesson 7: Solve two-step word problems.<br><br>G5 M3 Lesson 9: Add fractions making like units numerically.<br><br>G5 M3 Lesson 13: Use fraction benchmark numbers to assess reasonableness of addition and subtraction equations.<br><br>G5 M3 Lesson 15: Solve multi-step word problems; assess reasonableness of solutions using benchmark numbers.<br><br>G5 M3 Lesson 16: Explore part-to-whole relationships.<br><br>G5 M6 Topic E: Multi-Step Word Problems<br><br>G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction<br><br>*Supplemental material is necessary to address expressing answers in simplest form.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.CE.1.e**<br><br>Estimate, determine, and justify the solution to single-step and multistep problems in context that involve multiplication and division with fractions (proper or improper) and mixed numbers that include denominators of 12 or less. Answers are expressed in simplest form. | G5 M4 Lesson 11: Solve and create fraction word problems involving addition, subtraction, and multiplication.<br><br>G5 M4 Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.<br><br>G5 M4 Lesson 16: Solve word problems using tape diagrams and fraction-by-fraction multiplication.<br><br>G5 M4 Lesson 24: Solve word problems using fraction and decimal multiplication.<br><br>G5 M5 Lesson 14: Solve real-world problems involving area of figures with fractional side lengths using visual models and/or equations.<br><br>G5 M5 Lesson 15: Solve real-world problems involving area of figures with fractional side lengths using visual models and/or equations.<br><br>G5 M6 Topic E: Multi-Step Word Problems<br><br>G6 M2 Topic A: Arithmetic Operations Including Dividing by a Fraction<br><br>*Supplemental material is necessary to address expressing answers in simplest form.* |

## Computation and Estimation

**6.CE.2 The student will estimate, demonstrate, solve, and justify solutions to problems using operations with integers, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.CE.2.a**<br><br>Demonstrate/model addition, subtraction, multiplication, and division of integers using pictorial representations or concrete manipulatives. | G7 M2 Topic A: Addition and Subtraction of Integers and Rational Numbers<br><br>G7 M2 Topic B: Multiplication and Division of Integers and Rational Numbers |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.CE.2.b**<br><br>Add, subtract, multiply, and divide two integers. | G7 M2 Topic A: Addition and Subtraction of Integers and Rational Numbers<br><br>G7 M2 Topic B: Multiplication and Division of Integers and Rational Numbers<br><br>G7 M2 Lesson 18: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers<br><br>G7 M2 Lesson 19: Writing, Evaluating, and Finding Equivalent Expressions with Rational Numbers<br><br>G7 M2 Lesson 20: Investments—Performing Operations with Rational Numbers<br><br>G7 M2 Lesson 21: If-Then Moves with Integer Number Cards |
| **6.CE.2.c**<br><br>Simplify an expression that contains absolute value bars \| \| and an operation with two integers (e.g., $-\|5-8\|$ or $\frac{\|-12\|}{8}$ ) and represent the result on a number line. | G6 M3 Lesson 11: Absolute Value—Magnitude and Distance<br><br>G6 M3 Lesson 12: The Relationship Between Absolute Value and Order |
| **6.CE.2.d**<br><br>Estimate, determine, and justify the solution to one and two-step contextual problems, involving addition, subtraction, multiplication, and division with integers. | G6 M4 Lesson 26: One-Step Equations—Addition and Subtraction<br><br>G6 M4 Lesson 27: One-Step Equations—Multiplication and Division<br><br>G6 M4 Lesson 28: Two-Step Problems—All Operations<br><br>G6 M4 Lesson 29: Multi-Step Problems—All Operations<br><br>G6 M4 Lesson 30: One-Step Problems in the Real World<br><br>G6 M4 Lesson 31: Problems in Mathematical Terms<br><br>G6 M4 Lesson 32: Multi-Step Problems in the Real World |

## Measurement and Geometry

**6.MG.1 The student will identify the characteristics of circles and solve problems, including those in context, involving circumference and area.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.1.a**<br><br>Identify and describe chord, diameter, radius, circumference, and area of a circle. | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.b**<br><br>Investigate and describe the relationship between: | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.b.i**<br><br>diameter and radius; | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.b.ii**<br><br>radius and circumference; and | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.MG.1.b.iii**<br><br>diameter and circumference. | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.c**<br><br>Develop an approximation for pi (3.14) by gathering data and comparing the circumference to the diameter of various circles, using concrete manipulatives or technological models. | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.d**<br><br>Develop the formula for circumference using the relationship between diameter, radius, and pi. | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |
| **6.MG.1.e**<br><br>Solve problems, including those in context, involving circumference and area of a circle when given the length of the diameter or radius. | G7 M3 Lesson 16: The Most Famous Ratio of All<br>G7 M3 Lesson 17: The Area of a Circle<br>G7 M3 Lesson 18: More Problems on Area and Circumference<br>G7 M3 Lesson 20: Composite Area Problems |

## Measurement and Geometry

**6.MG.2 The student will reason mathematically to solve problems, including those in context, that involve the area and perimeter of triangles and parallelograms.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.2.a**<br><br>Develop the formula for determining the area of parallelograms and triangles using pictorial representations and concrete manipulatives (e.g., two-dimensional diagrams, grid paper). | G6 M5 Topic A: Area of Triangles, Quadrilaterals, and Polygons<br><br>G6 M5 Lesson 8: Drawing Polygons in the Coordinate Plane<br><br>G6 M5 Lesson 9: Determining Perimeter and Area of Polygons on the Coordinate Plane |
| **6.MG.2.b**<br><br>Solve problems, including those in context, involving the perimeter and area of triangles and parallelograms. | G6 M5 Topic A: Area of Triangles, Quadrilaterals, and Polygons<br><br>G6 M5 Lesson 8: Drawing Polygons in the Coordinate Plane<br><br>G6 M5 Lesson 9: Determining Perimeter and Area of Polygons on the Coordinate Plane |

## Measurement and Geometry

**6.MG.3 The student will describe the characteristics of the coordinate plane and graph ordered pairs.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.3.a**<br><br>Identify and label the axes, origin, and quadrants of a coordinate plane. | G6 M3 Topic C: Rational Numbers and the Coordinate Plane |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.3.b**<br><br>Identify and describe the location (quadrant or the axis) of a point given as an ordered pair. Ordered pairs will be limited to coordinates expressed as integers. | G6 M3 Topic C: Rational Numbers and the Coordinate Plane |
| **6.MG.3.c**<br><br>Graph ordered pairs in the four quadrants and on the axes of a coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. | G6 M3 Topic C: Rational Numbers and the Coordinate Plane |
| **6.MG.3.d**<br><br>Identify ordered pairs represented by points in the four quadrants and on the axes of the coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. | G6 M3 Topic C: Rational Numbers and the Coordinate Plane |
| **6.MG.3.e**<br><br>Relate the coordinates of a point to the distance from each axis and relate the coordinates of a single point to another point on the same horizontal or vertical line. Ordered pairs will be limited to coordinates expressed as integers. | G6 M3 Topic C: Rational Numbers and the Coordinate Plane |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.3.f**<br><br>Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to determine the length of a side joining points with the same first coordinate or the same second coordinate. Ordered pairs will be limited to coordinates expressed as integers. Apply these techniques in the context of solving contextual and mathematical problems. | G6 M5 Topic B: Polygons on the Coordinate Plane |

## Measurement and Geometry

**6.MG.4 The student will determine congruence of segments, angles, and polygons.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.4.a**<br><br>Identify regular polygons. | *Supplemental material is necessary to address this standard.* |
| **6.MG.4.b**<br><br>Draw lines of symmetry to divide regular polygons into two congruent parts. | *Supplemental material is necessary to address this standard.* |
| **6.MG.4.c**<br><br>Determine the congruence of segments, angles, and polygons given their properties. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.MG.4.d**<br><br>Determine whether polygons are congruent or noncongruent according to the measures of their sides and angles. | *Supplemental material is necessary to address this standard.* |

## Probability and Statistics

**6.PS.1 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 circle graphs.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.PS.1.a**<br><br>Formulate questions that require the collection or acquisition of data with a focus on circle graphs. | G6 M6 Lesson 1: Posing Statistical Questions |
| **6.PS.1.b**<br><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). | G6 M6 Lesson 2: Displaying a Data Distribution<br><br>G6 M6 Lesson 3: Creating a Dot Plot<br><br>G6 M6 Lesson 4: Creating a Histogram<br><br>G6 M6 Lesson 5: Describing a Distribution Displayed in a Histogram<br><br>G6 M6 Topic B: Summarizing a Distribution that Is Approximately Symmetric Using the Mean and Mean Absolute Deviation<br><br>G6 M6 Topic C: Summarizing a Distribution that is Skewed Using the Median and the Interquartile Range<br><br>G6 M6 Topic D: Summarizing and Describing Distributions |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.PS.1.c**<br><br>Determine the factors that will ensure that the data collected is a sample that is representative of a larger population. | G7 M5 Lesson 14: Selecting a Sample<br><br>G7 M5 Lesson 15: Random Sampling<br><br>G7 M5 Lesson 16: Methods for Selecting a Random Sample<br><br>G7 M5 Lesson 17: Sampling Variability<br><br>G7 M5 Lesson 18: Sampling Variability and the Effect of Sample Size<br><br>G7 M5 Lesson 19: Understanding Variability When Estimating a Population Proportion<br><br>G7 M5 Lesson 20: Estimating a Population Proportion |
| **6.PS.1.d**<br><br>Organize and represent data using circle graphs, with and without the use of technology tools. The number of data values should be limited to allow for comparisons that have denominators of 12 or less or those that are factors of 100 (e.g., in a class of 20 students, 7 choose apples as a favorite fruit, so the comparison is 7 out of 20, $\frac{7}{20}$, or 35%). | *Supplemental material is necessary to address this standard.* |
| **6.PS.1.e**<br><br>Analyze data represented in a circle graph by making observations and drawing conclusions. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.PS.1.f**<br><br>Compare data represented in a circle graph with the same data represented in other graphs, including but not limited to bar graphs, pictographs, and line plots (dot plots), and justify which graphical representation best represents the data. | *Supplemental material is necessary to address this standard.* |

## Probability and Statistics

**6.PS.2 The student will represent the mean as a balance point and determine the effect on statistical measures when a data point is added, removed, or changed.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
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| **6.PS.2.a**<br><br>Represent the mean of a set of data graphically as the balance point represented in a line plot (dot plot). | G6 M6 Lesson 7: The Mean as a Balance Point |
| **6.PS.2.b**<br><br>Determine the effect on measures of center when a single value of a data set is added, removed, or changed. | *Supplemental material is necessary to address this standard.* |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.PS.2.c**<br><br>Observe patterns in data to identify outliers and determine their effect on mean, median, mode, or range. | G6 M6 Lesson 2: Displaying a Data Distribution<br><br>G6 M6 Lesson 3: Creating a Dot Plot<br><br>G6 M6 Lesson 4: Creating a Histogram<br><br>G6 M6 Lesson 5: Describing a Distribution Displayed in a Histogram<br><br>G6 M6 Topic B: Summarizing a Distribution that Is Approximately Symmetric Using the Mean and Mean Absolute Deviation<br><br>G6 M6 Topic C: Summarizing a Distribution that is Skewed Using the Median and the Interquartile Range<br><br>G6 M6 Topic D: Summarizing and Describing Distributions |

## Patterns, Functions, and Algebra

**6.PFA.1 The student will use ratios to represent relationships between quantities, including those in context.**

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.PFA.1.a**<br><br>Represent a relationship between two quantities using ratios. | G6 M1 Topic A: Representing and Reasoning About Ratios<br><br>G6 M1 Topic B: Collections of Equivalent Ratios<br><br>G6 M1 Topic C: Unit Rates<br><br>G6 M1 Lesson 24: Percent and Rates per 100<br><br>G6 M1 Lesson 25: A Fraction as a Percent |
| **6.PFA.1.b**<br><br>Represent a relationship in context that makes a comparison by using the notations $\frac{a}{b}$, $a{:}b$, and $a$ to $b$. | G6 M1 Topic A: Representing and Reasoning About Ratios |

| Mathematics Standards of Learning for Virginia Public Schools | Aligned Components of *Eureka Math* |
|---|---|
| **6.PFA.1.c**<br><br>Represent different comparisons within the same quantity or between different quantities (e.g., part to part, part to whole, whole to whole). | G6 M1 Topic A: Representing and Reasoning About Ratios |
| **6.PFA.1.d**<br><br>Create a relationship in words for a given ratio expressed symbolically. | *Supplemental material is necessary to address this standard.* |
| **6.PFA.1.e**<br><br>Create a table of equivalent ratios to represent a proportional relationship between two quantities, when given a ratio. | G6 M1 Topic A: Representing and Reasoning About Ratios |
| **6.PFA.1.f**<br><br>Create a table of equivalent ratios to represent a proportional relationship between two quantities, when given a contextual situation. | G6 M1 Topic A: Representing and Reasoning About Ratios |

## Patterns, Functions, and Algebra
**6.PFA.2 The student will identify and represent proportional relationships between two quantities, including those in context (unit rates are limited to positive values).**

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| **6.PFA.2.a**<br><br>Identify the unit rate of a proportional relationship represented by a table of values, a contextual situation, or a graph. | G6 M1 Lesson 21: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 22: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions |
| **6.PFA.2.b**<br><br>Determine a missing value in a ratio table that represents a proportional relationship between two quantities using a unit rate. | G6 M1 Topic C: Unit Rates<br><br>G6 M5 Lesson 12: From Unit Cubes to the Formulas for Volume<br><br>G6 M5 Lesson 20: Addendum Lesson for Modeling–Applying Surface Area and Volume to Aquariums |
| **6.PFA.2.c**<br><br>Determine whether a proportional relationship exists between two quantities, when given a table of values, context, or graph. | G6 M1 Topic C: Unit Rates<br><br>G6 M1 Lesson 21: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 22: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions |
| **6.PFA.2.d**<br><br>When given a contextual situation representing a proportional relationship, find the unit rate and create a table of values or a graph. | G6 M1 Topic C: Unit Rates<br><br>G6 M1 Lesson 21: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 22: Getting the Job Done—Speed, Work, and Measurement Units<br><br>G6 M1 Lesson 23: Problem-Solving Using Rates, Unit Rates, and Conversions |

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| **6.PFA.2.e**<br><br>Make connections between and among multiple representations of the same proportional relationship using verbal descriptions, ratio tables, and graphs. | G6 M1 Topic C: Unit Rates |

## Patterns, Functions, and Algebra

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

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| **6.PFA.3.a**<br><br>Identify and develop examples of the following algebraic vocabulary: equation, variable, expression, term, and coefficient. | G6 M4 Topic E: Expressing Operations in Algebraic Form<br><br>G6 M4 Topic F: Writing and Evaluating Expressions and Formulas<br><br>G6 M4 Topic G: Solving Equations |
| **6.PFA.3.b**<br><br>Represent and solve one-step linear equations in one variable, using a variety of concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles, weights on a balance scale). | G6 M4 Topic G: Solving Equations<br><br>*Supplemental material is necessary to address using algebra tiles and weights.* |

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| **6.PFA.3.c**<br><br>Apply properties of real numbers and properties of equality to solve a one-step equation in one variable. Coefficients are limited to integers and unit fractions. Numeric terms are limited to integers. | G6 M4 Lesson 26: One-Step Equations—Addition and Subtraction<br><br>G6 M4 Lesson 27: One-Step Equations—Multiplication and Division<br><br>G6 M4 Lesson 28: Two-Step Problems—All Operations<br><br>G6 M4 Lesson 29: Multi-Step Problems—All Operations<br><br>G6 M4 Lesson 30: One-Step Problems in the Real World<br><br>G6 M4 Lesson 31: Problems in Mathematical Terms<br><br>G6 M4 Lesson 32: Multi-Step Problems in the Real World |
| **6.PFA.3.d**<br><br>Confirm solutions to one-step linear equations in one variable using a variety of concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles, weights on a balance scale). | G6 M4 Topic G: Solving Equations<br><br>*Supplemental material is necessary to address using algebra tiles and weights.* |
| **6.PFA.3.e**<br><br>Write a one-step linear equation in one variable to represent a verbal situation, including those in context. | G6 M4 Lesson 26: One-Step Equations—Addition and Subtraction<br><br>G6 M4 Lesson 27: One-Step Equations—Multiplication and Division<br><br>G6 M4 Lesson 28: Two-Step Problems—All Operations<br><br>G6 M4 Lesson 29: Multi-Step Problems—All Operations<br><br>G6 M4 Lesson 30: One-Step Problems in the Real World<br><br>G6 M4 Lesson 31: Problems in Mathematical Terms<br><br>G6 M4 Lesson 32: Multi-Step Problems in the Real World |

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| **6.PFA.3.f**<br><br>Create a verbal situation in context given a one-step linear equation in one variable. | *Supplemental material is necessary to address this standard.* |

## Patterns, Functions, and Algebra

**6.PFA.4 The student will represent a contextual situation using a linear inequality in one variable with symbols and graphs on a number line.**

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| **6.PFA.4.a**<br><br>Given the graph of a linear inequality in one variable on a number line, represent the inequality in two equivalent ways (e.g., $x < -5$ or $-5 > x$) using symbols. Symbols include $<, >, \leq, \geq$. | G6 M4 Lesson 33: From Equations to Inequalities<br><br>G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems |
| **6.PFA.4.b**<br><br>Write a linear inequality in one variable to represent a given constraint or condition in context or given a graph on a number line. | G6 M4 Lesson 33: From Equations to Inequalities<br><br>G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems |

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| **6.PFA.4.c**<br><br>Given a linear inequality in one variable, create a corresponding contextual situation or create a number line graph. | G6 M4 Lesson 33: From Equations to Inequalities<br><br>G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems |
| **6.PFA.4.d**<br><br>Use substitution or a number line graph to justify whether a given number in a specified set makes a linear inequality in one variable true. | G6 M4 Lesson 33: From Equations to Inequalities<br><br>G6 M4 Lesson 34: Writing and Graphing Inequalities in Real-World Problems |
| **6.PFA.4.e**<br><br>Identify a numerical value(s) that is part of the solution set of a given inequality in one variable. | G6 M4 Topic G: Solving Equations<br><br>G6 M4 Topic H: Applications of Equations |