

# SCOPE AND

## Regular Pathway



### Grade 6

- |  |  |
|--|--|
| <b>Ratios and Proportional Relationships</b> | – Understand Ratio Concepts; Use Ratio Reasoning                       |
| <b>The Number System</b>                     | – Perform Fraction and Decimal Operations; Understand Rational Numbers |
| <b>Expressions and Equations</b>             | – Write, Interpret, and Use Expressions, Equations, and Inequalities   |
| <b>Geometry</b>                              | – Solve Problems Involving Area, Surface Area, and Volume              |
| <b>Statistics and Probability</b>            | – Summarize and Describe Distributions; Understand Variability         |

### Grade 7

- |  |   |
|--|---|
| <b>Ratios and Proportional Relationships</b> | – Analyze Proportional Relationships  |
| <b>The Number System</b>                     | – Perform Rational Number Operations  |
| <b>Expressions and Equations</b>             | – Generate Equivalent Expressions; Solve Problems Using Linear Equations and Inequalities       |
| <b>Geometry</b>                              | – Understand Geometric Relationships; Solve Problems Involving Angles, Surface Area, and Volume |
| <b>Statistics and Probability</b>            | – Analyze and Compare Populations; Find Probabilities of Events                                 |

### Grade 8

- |                                   |   |
|-----------------------------------|---|
| <b>The Number System</b>          | – Approximate Real Numbers; Perform Real Number Operations  |
| <b>Expressions and Equations</b>  | – Use Radicals and Integer Exponents; Connect Proportional Relationships and Lines; Solve Systems of Linear Equations |
| <b>Functions</b>                  | – Define, Evaluate, and Compare Functions; Model Relationships  |
| <b>Geometry</b>                   | – Understand Congruence and Similarity; Apply the Pythagorean Theorem; Apply Volume Formulas                          |
| <b>Statistics and Probability</b> | – Analyze Bivariate Data  |

# SEQUENCE

## Compacted Pathway



### Grade 6

#### Ratios and Proportional Relationships

- Understand Ratio Concepts; Use Ratio Reasoning

#### The Number System

- Perform Fraction and Decimal Operations; Understand Rational Numbers

#### Expressions and Equations

- Write, Interpret, and Use Expressions, Equations, and Inequalities

#### Geometry

- Solve Problems Involving Area, Surface Area, and Volume

#### Statistics and Probability

- Summarize and Describe Distributions; Understand Variability

### Grade 7 Accelerated

#### Number and Quantity

- Analyze Proportional Relationships; Perform Real Number Operations; Use Radicals and Integer Exponents

#### Algebra

- Generate Equivalent Expressions; Connect Proportional Relationships and Lines; Solve Problems Using Linear Equations and Inequalities

#### Geometry

- Understand Geometric Relationships and Similarity; Solve Problems Involving Angles, Surface Area, and Volume

#### Statistics and Probability

- Analyze and Compare Populations; Find Probabilities of Events

### Grade 8 Algebra 1

#### Number and Quantity

- Use Rational Exponents; Perform Real Number Operations

#### Algebra

- Solve Linear and Quadratic Equations; Solve Inequalities and Systems of Equations

#### Functions

- Define, Evaluate, and Compare Functions; Write Sequences; Model Relationships

#### Geometry

- Apply the Pythagorean Theorem

#### Statistics and Probability

- Represent and Interpret Data; Analyze Bivariate Data

# COMMON CORE STATE STANDARDS TO BOOK CORRELATION

*After a standard is introduced, it is revisited many times in subsequent activities, lessons, and exercises.*

## **Domain:** Ratios and Proportional Relationships

### **Standards**

- 6.RP.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
- **Section 5.1** Ratios
  - **Section 5.2** Ratio Tables
  - **Section 5.3** Rates
  - **Section 5.4** Comparing and Graphing Ratios
- 6.RP.2** Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship.
- **Section 5.3** Rates
  - **Section 5.4** Comparing and Graphing Ratios
- 6.RP.3** Use ratio and rate reasoning to solve real-world and mathematical problems.
- a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
    - **Section 5.2** Ratio Tables
    - **Section 5.3** Rates
    - **Section 5.4** Comparing and Graphing Ratios
    - **Section 7.4** Writing Equations in Two Variables
  - b. Solve unit rate problems including those involving unit pricing and constant speed.
    - **Section 5.3** Rates
    - **Section 5.4** Comparing and Graphing Ratios
  - c. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.
    - **Section 5.5** Percents
    - **Section 5.6** Solving Percent Problems
  - d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
    - **Section 5.7** Converting Measures

## Domain: The Number System

### Standards

- 6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.
- **Section 2.1** Multiplying Fractions
  - **Section 2.2** Dividing Fractions
  - **Section 2.3** Dividing Mixed Numbers
- 6.NS.2** Fluently divide multi-digit numbers using the standard algorithm.
- **Section 1.1** Whole Number Operations
- 6.NS.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- **Section 2.4** Adding and Subtracting Decimals
  - **Section 2.5** Multiplying Decimals
  - **Section 2.6** Dividing Decimals
- 6.NS.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
- **Section 1.4** Prime Factorization
  - **Section 1.5** Greatest Common Factor
  - **Section 1.6** Least Common Multiple
  - **Extension 1.6** Adding and Subtracting Fractions
  - **Section 3.4** The Distributive Property
  - **Extension 3.4** Factoring Expressions
- 6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- **Section 6.1** Integers
  - **Section 6.3** Fractions and Decimals on the Number Line
- 6.NS.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
- a.** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, and that 0 is its own opposite.
- **Section 6.1** Integers
  - **Section 6.3** Fractions and Decimals on the Number Line

- b.** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
  - **Section 6.5** The Coordinate Plane
  - **Extension 6.5** Reflecting Points in the Coordinate Plane
- c.** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
  - **Section 6.1** Integers
  - **Section 6.2** Comparing and Ordering Integers
  - **Section 6.3** Fractions and Decimals on the Number Line
  - **Section 6.4** Absolute Value
  - **Section 6.5** The Coordinate Plane
  - **Extension 6.5** Reflecting Points in the Coordinate Plane

**6.NS.7** Understand ordering and absolute value of rational numbers.

- a.** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
  - **Section 6.2** Comparing and Ordering Integers
  - **Section 6.3** Fractions and Decimals on the Number Line
  - **Section 6.4** Absolute Value
- b.** Write, interpret, and explain statements of order for rational numbers in real-world contexts.
  - **Section 6.2** Comparing and Ordering Integers
  - **Section 6.3** Fractions and Decimals on the Number Line
  - **Section 6.4** Absolute Value
- c.** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
  - **Section 6.4** Absolute Value
- d.** Distinguish comparisons of absolute value from statements about order.
  - **Section 6.4** Absolute Value

**6.NS.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distance between points with the same first coordinate or the same second coordinate.

- **Section 6.5** The Coordinate Plane

## **Domain:** Expressions and Equations

### **Standards**

**6.EE.1** Write and evaluate numerical expressions involving whole-number exponents.

- **Section 1.2** Powers and Exponents
- **Section 1.3** Order of Operations

**6.EE.2** Write, read, and evaluate expressions in which letters stand for numbers.

- Write expressions that record operations with numbers and with letters standing for numbers.
  - **Section 3.2** Writing Expressions
- Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
  - **Section 1.5** Greatest Common Factor
  - **Section 3.4** The Distributive Property
  - **Extension 3.4** Factoring Expressions
- Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
  - **Section 3.1** Algebraic Expressions

**6.EE.3** Apply the properties of operations to general equivalent expressions.

- **Section 3.3** Properties of Addition and Multiplication
- **Section 3.4** The Distributive Property
- **Extension 3.4** Factoring Expressions

**6.EE.4** Identify when two expressions are equivalent.

- **Section 3.3** Properties of Addition and Multiplication
- **Section 3.4** The Distributive Property
- **Extension 3.4** Factoring Expressions

**6.EE.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

- **Section 7.2** Solving Equations Using Addition or Subtraction
- **Section 7.3** Solving Equations Using Multiplication or Division
- **Section 7.5** Writing and Graphing Inequalities
- **Section 7.6** Solving Inequalities Using Addition or Subtraction
- **Section 7.7** Solving Inequalities Using Multiplication or Division

- 6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- **Section 3.2** Writing Expressions
  - **Section 3.3** Properties of Addition and Multiplication
  - **Section 3.4** The Distributive Property
  - **Section 7.1** Writing Equations in One Variable
- 6.EE.7** Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$ , and  $x$  are all nonnegative rational numbers.
- **Section 7.1** Writing Equations in One Variable
  - **Section 7.2** Solving Equations Using Addition or Subtraction
  - **Section 7.3** Solving Equations Using Multiplication or Division
- 6.EE.8** Write an inequality of the form  $x > c$  or  $x < c$  to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form  $x > c$  or  $x < c$  have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
- **Section 7.5** Writing and Graphing Inequalities
  - **Section 7.6** Solving Inequalities Using Addition or Subtraction
  - **Section 7.7** Solving Inequalities Using Multiplication or Division
- 6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.
- **Section 7.4** Writing Equations in Two Variables

## Domain: Geometry

### Standards

- 6.G.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- **Section 4.1** Areas of Parallelograms
  - **Section 4.2** Areas of Triangles
  - **Section 4.3** Areas of Trapezoids
  - **Extension 4.3** Areas of Composite Figures
- 6.G.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge length of the prism. Apply the formulas  $V = \ell wh$  and  $V = bh$  to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
- **Section 8.4** Volumes of Rectangular Prisms

- 6.G.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- **Section 4.4** Polygons in the Coordinate Plane
- 6.G.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
- **Section 8.1** Three-Dimensional Figures
  - **Section 8.2** Surface Areas of Prisms
  - **Section 8.3** Surface Areas of Pyramids

## **Domain:** Statistics and Probability

### **Standards**

- 6.SP.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
- **Section 9.1** Introduction to Statistics
- 6.SP.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- **Section 9.1** Introduction to Statistics
  - **Section 9.2** Mean
  - **Section 9.3** Measures of Center
  - **Section 9.4** Measures of Variation
  - **Section 9.5** Mean Absolute Deviation
  - **Section 10.2** Histograms
  - **Section 10.3** Shapes of Distributions
  - **Section 10.4** Box-and-Whisker Plots
- 6.SP.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
- **Section 9.2** Mean
  - **Section 9.3** Measures of Center
  - **Section 9.4** Measures of Variation
  - **Section 9.5** Mean Absolute Deviation
- 6.SP.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- **Section 9.1** Introduction to Statistics
  - **Section 10.1** Stem-and-Leaf Plots
  - **Section 10.2** Histograms
  - **Section 10.3** Shapes of Distributions
  - **Section 10.4** Box-and-Whisker Plots

- 6.SP.5** Summarize numerical data sets in relation to their context, such as by:
- a.** Reporting the number of observations.
    - **Section 9.1** Introduction to Statistics
    - **Section 9.2** Mean
    - **Section 9.5** Mean Absolute Deviation
  - b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
    - **Section 9.1** Introduction to Statistics
  - c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
    - **Section 9.2** Mean
    - **Section 9.3** Measures of Center
    - **Section 9.4** Measures of Variation
    - **Section 9.5** Mean Absolute Deviation
    - **Section 10.4** Box-and-Whisker Plots
  - d.** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
    - **Extension 10.3** Choosing Appropriate Measures

# BOOK TO COMMON CORE STATE STANDARDS CORRELATION

## Chapter 1

### Numerical Expressions and Factors

#### The Number System

6.NS.2  
6.NS.4

#### Expressions and Equations

6.EE.1  
6.EE.2b

## Chapter 2

### Fractions and Decimals

#### The Number System

6.NS.1  
6.NS.3

## Chapter 3

### Algebraic Expressions and Properties

#### The Number System

6.NS.4

#### Expressions and Equations

6.EE.2a–c      6.EE.4  
6.EE.3      6.EE.6

## Chapter 4

### Areas of Polygons

#### Geometry

6.G.1  
6.G.3

## Chapter 5

### Ratios and Rates

#### Ratios and Proportional Relationships

6.RP.1  
6.RP.2  
6.RP.3a–d

## Chapter 6

### Integers and the Coordinate Plane

#### The Number System

6.NS.5  
6.NS.6a–c  
6.NS.7a–d  
6.NS.8

## Chapter 7

### Equations and Inequalities

#### Ratios and Proportional Relationships

6.RP.3a

#### Expressions and Equations

6.EE.5      6.EE.8  
6.EE.6      6.EE.9  
6.EE.7

## Chapter 8

### Surface Area and Volume

#### Geometry

6.G.2  
6.G.4

## Chapter 9

### Statistical Measures

#### Statistics and Probability

6.SP.1      6.SP.4  
6.SP.2      6.SP.5a–c  
6.SP.3

## Chapter 10

### Data Displays

#### Statistics and Probability

6.SP.2  
6.SP.4  
6.SP.5c–d