

# SCOPE AND

## Regular 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

#### Ratios and Proportional Relationships

- Analyze Proportional Relationships

#### The Number System

- Perform Rational Number Operations

#### Expressions and Equations

- Generate Equivalent Expressions; Solve Problems Using Linear Equations and Inequalities

#### Geometry

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

#### Statistics and Probability

- Analyze and Compare Populations; Find Probabilities of Events

### Grade 8

#### The Number System

- Approximate Real Numbers; Perform Real Number Operations

#### Expressions and Equations

- Use Radicals and Integer Exponents; Connect Proportional Relationships and Lines; Solve Systems of Linear Equations

#### Functions

- Define, Evaluate, and Compare Functions; Model Relationships

#### Geometry

- Understand Congruence and Similarity; Apply the Pythagorean Theorem; Apply Volume Formulas

#### Statistics and Probability

- 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**

**7.RP.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

- **Section 5.1** Ratios and Rates

**7.RP.2** Recognize and represent proportional relationships between quantities.

**a.** Decide whether two quantities are in a proportional relationship.

- **Section 5.2** Proportions
- **Extension 5.2** Graphing Proportional Relationships
- **Section 5.6** Direct Variation

**b.** Identify the constant of proportionality (unit rate) in tables, graphs, equations, and diagrams, and verbal descriptions of proportional relationships.

- **Extension 5.2** Graphing Proportional Relationships
- **Section 5.4** Solving Proportions
- **Section 5.5** Slope
- **Section 5.6** Direct Variation

**c.** Represent proportional relationships by equations.

- **Section 5.3** Writing Proportions
- **Section 5.4** Solving Proportions
- **Section 5.6** Direct Variation

**d.** Explain what a point  $(x, y)$  on the graph of a proportional relationship means in terms of the situation, with special attention to the points  $(0, 0)$  and  $(1, r)$  where  $r$  is the unit rate.

- **Extension 5.2** Graphing Proportional Relationships
- **Section 5.6** Direct Variation

**7.RP.3** Use proportional relationships to solve multistep ratio and percent problems.

- **Section 5.1** Ratios and Rates
- **Section 5.3** Writing Proportions
- **Section 6.3** The Percent Proportion
- **Section 6.4** The Percent Equation
- **Section 6.5** Percents of Increase and Decrease
- **Section 6.6** Discounts and Markups
- **Section 6.7** Simple Interest

## Domain: The Number System

### Standards

- 7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
- a. Describe situations in which opposite quantities combine to make 0.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.2** Adding Integers
    - **Section 2.2** Adding Rational Numbers
  - b. Understand  $p + q$  as the number located a distance  $|q|$  from  $p$ , in the positive or negative direction depending on whether  $q$  is positive or negative. Show that a number and its opposite have the sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.2** Adding Integers
    - **Section 2.2** Adding Rational Numbers
  - c. Understand subtraction of rational numbers as adding the additive inverse,  $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.3** Subtracting Integers
    - **Section 2.3** Subtracting Rational Numbers
  - d. Apply properties of operations as strategies to add and subtract rational numbers.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.2** Adding Integers
    - **Section 1.3** Subtracting Integers
    - **Section 2.2** Adding Rational Numbers
    - **Section 2.3** Subtracting Rational Numbers
- 7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
- a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as  $(-1)(-1) = 1$  and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.4** Multiplying Integers
    - **Section 2.4** Multiplying and Dividing Rational Integers
  - b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If  $p$  and  $q$  are integers, then  $-(p/q) = (-p)/q = p/(-q)$ . Interpret quotients of rational numbers by describing real-world contexts.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.5** Dividing Integers
    - **Section 2.1** Rational Numbers
    - **Section 2.4** Multiplying and Dividing Rational Numbers
  - c. Apply properties of operations as strategies to multiply and divide rational numbers.
    - **Section 1.1** Integers and Absolute Value
    - **Section 1.4** Multiplying Integers
    - **Section 2.4** Multiplying and Dividing Rational Numbers



- d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

- **Section 1.1** Integers and Absolute Value
- **Section 2.1** Rational Numbers

- 7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.

- **Section 1.1** Integers and Absolute Value
- **Section 1.2** Adding Integers
- **Section 1.3** Subtracting Integers
- **Section 1.4** Multiplying Integers
- **Section 1.5** Dividing Integers
- **Section 2.2** Adding Rational Numbers
- **Section 2.3** Subtracting Rational Numbers
- **Section 2.4** Multiplying and Dividing Rational Numbers

## **Domain:** Expressions and Equations

### **Standards**

- 7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

- **Section 3.1** Algebraic Expressions
- **Section 3.2** Adding and Subtracting Linear Expressions
- **Extension 3.2** Factoring Expressions

- 7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

- **Section 3.1** Algebraic Expressions
- **Section 3.2** Adding and Subtracting Linear Expressions

- 7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimal), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

- **Section 6.1** Percents and Decimals
- **Section 6.2** Comparing and Ordering Fractions, Decimals, and Percents
- **Section 6.4** The Percent Equation

- 7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

- a. Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

- **Section 3.3** Solving Equations Using Addition or Subtraction
- **Section 3.4** Solving Equations Using Multiplication or Division
- **Section 3.5** Solving Two-Step Equations

- b. Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

- **Section 4.1** Writing and Graphing Inequalities
- **Section 4.2** Solving Inequalities Using Addition or Subtraction
- **Section 4.3** Solving Inequalities Using Multiplication or Division
- **Section 4.4** Solving Two-Step Inequalities

## Domain: Geometry

### Standards

- 7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- **Section 7.5** Scale Drawings
- 7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
- **Section 7.3** Triangles
  - **Section 7.4** Quadrilaterals
- 7.G.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
- **Extension 9.5** Cross Sections of Three-Dimensional Figures
- 7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
- **Section 8.1** Circles and Circumference
  - **Section 8.2** Perimeters of Composite Figures
  - **Section 8.3** Areas of Circles
  - **Section 9.3** Surface Areas of Cylinders
- 7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
- **Section 7.1** Adjacent and Vertical Angles
  - **Section 7.2** Complementary and Supplementary Angles
  - **Extension 7.3** Angle Measures of Triangles
- 7.G.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
- **Section 8.4** Areas of Composite Figures
  - **Section 9.1** Surface Areas of Prisms
  - **Section 9.2** Surface Areas of Pyramids
  - **Section 9.4** Volumes of Prisms
  - **Section 9.5** Volumes of Pyramids

## Domain: Statistics and Probability

### Standards

- 7.SP.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
- **Section 10.6** Samples and Populations

- 7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
- **Section 10.6** Samples and Populations
  - **Extension 10.6** Generating Multiple Samples
- 7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
- **Section 10.7** Comparing Populations
- 7.SP.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
- **Section 10.7** Comparing Populations
- 7.SP.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around  $\frac{1}{2}$  indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
- **Section 10.1** Outcomes and Events
  - **Section 10.2** Probability
  - **Section 10.3** Experimental and Theoretical Probability
- 7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
- **Section 10.3** Experimental and Theoretical Probability
- 7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
- Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
    - **Section 10.2** Probability
    - **Section 10.3** Experimental and Theoretical Probability
  - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
    - **Section 10.3** Experimental and Theoretical Probability
- 7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
    - **Section 10.4** Compound Events
    - **Section 10.5** Independent and Dependent Events
  - Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event.
    - **Section 10.4** Compound Events
    - **Section 10.5** Independent and Dependent Events
  - Design and use a simulation to generate frequencies for compound events.
    - **Extension 10.5** Simulations

# BOOK TO COMMON CORE STATE STANDARDS CORRELATION

## Chapter 1

### Integers

#### The Number System

- 7.NS.1a–d
- 7.NS.2a–d
- 7.NS.3

## Chapter 2

### Rational Numbers

#### The Number System

- 7.NS.1a–d
- 7.NS.2a–d
- 7.NS.3

## Chapter 3

### Expressions and Equations

#### Expressions and Equations

- 7.EE.1
- 7.EE.2
- 7.EE.4a

## Chapter 4

### Inequalities

#### Expressions and Equations

- 7.EE.4b

## Chapter 5

### Ratios and Proportions

#### Ratios and Proportional Relationships

- 7.RP.1
- 7.RP.2a–d
- 7.RP.3

## Chapter 6

### Percents

#### Ratios and Proportional Relationships

- 7.RP.3

#### Expressions and Equations

- 7.EE.3

## Chapter 7

### Constructions and Scale Drawings

#### Geometry

- 7.G.1
- 7.G.2
- 7.G.5

## Chapter 8

### Circles and Area

#### Geometry

- 7.G.4
- 7.G.6

## Chapter 9

### Surface Area and Volume

#### Geometry

- 7.G.4
- 7.G.6

## Chapter 10

### Probability and Statistics

#### Statistics and Probability

- 7.SP.1
- 7.SP.2
- 7.SP.3
- 7.SP.4
- 7.SP.5
- 7.SP.6
- 7.SP.7a–b
- 7.SP.8a–c