

### **Ratios & Proportional Relationships:**

#### **7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.**

- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.
- Identify and represent proportional relationships between quantities. (CCSS: 7.RP.A.2)
  - a. Determine whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. (CCSS: 7.RP.A.2.a)
  - b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. (CCSS: 7.RP.A.2.b)
  - c. Represent proportional relationships by equations. (CCSS: 7.RP.A.2.c)
  - 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. (CCSS: 7.RP.A.2.d)
- Use proportional relationships to solve multistep ratio and percent problems. (CCSS: 7.RP.A.3)

### **The Number System:**

#### **7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**

- 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. (CCSS: 7.NS.A.1)
- Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (CCSS: 7.NS.A.2)
- Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) (CCSS: 7.NS.A.3)

### **Expressions & Equations:**

#### **7.EE.A Use properties of operations to generate equivalent expressions.**

- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. (CCSS: 7.EE.A.1)

#### **7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations**

- Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), 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. (CCSS: 7.EE.B.3)

- 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. (CCSS: 7.EE.B.4)
  - 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 (CCSS: 7.EE.B.4.a)