Ratios and Proportional Relationships
7.RP.A*

Analyze proportional relationships and use them to solve real-world and mathematical problems.

STANDARD 1

7.RP.A.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour.*

STANDARD 2

7.RP.A.2: Recognize and represent proportional relationships between quantities.

   a. Decide 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.

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

   c. Represent proportional relationships by equations. *For example, if total cost* t *is proportional to the number* n *of items purchased at a constant price* p, *the relationship between the total cost and the number of items can be expressed as* t = pn.

   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.

STANDARD 3

7.RP.A.3: Use proportional relationships to solve multi-step ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

*Major cluster

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Cluster A: Analyze proportional relationships and use them to solve real-world and mathematical problems.
Grade 7 Overview

These standards extend what students learned in Grade 6 about ratios to analyzing proportions and proportional relationships. Students calculate unit rates with complex fractions and move to recognizing and representing proportional relationships in equations and on graphs. These skills and understandings are used to solve multi-step ratio and percent problems involving real-world scenarios such as interest, tax, shopping sales, and so on.

Standards for Mathematical Practice
SFMP 1. Make sense of problems and persevere in solving them.

Students solve multi-step ratio and real-world percent problems.

SFMP 3. Construct viable arguments and critique the reasoning of others.

Students recognize proportional relationships from non-proportional ones and discuss their reasoning with others.

SFMP 4. Model with mathematics.

Students learn to represent proportional relationships as tables, graphs, verbal descriptions, diagrams, and equations.

SFMP 6. Attend to precision.

Students use units in their ratios requiring them to attend to the units such as 8 miles in 4 hours is a rate of 2 miles per hour.

Related Content Standards

6.RP.A.2   7.EE.A.2   8.EE.B.5