



## Topic B:

## Unit Rate and Constant of Proportionality

7.RP.A.2b, 7.RP.A.2c, 7.RP.A.2d, 7.EE.B.4a

<b>Focus Standard:</b>	7.RP.A.2b	Recognize and represent proportional relationships between quantities.
	7.RP.A.2c	b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
	7.RP.A.2d	c. Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i>
		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.
	7.EE.B.4a	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. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i>
<b>Instructional Days:</b>	4	
<b>Lesson 7:</b>	Unit Rate as the Constant of Proportionality (P) <sup>1</sup>	
<b>Lessons 8–9:</b>	Representing Proportional Relationships with Equations (P)	
<b>Lesson 10:</b>	Interpreting Graphs of Proportional Relationships (P)	

<sup>1</sup> Lesson Structure Key: **P**-Problem Set Lesson, **M**-Modeling Cycle Lesson, **E**-Exploration Lesson, **S**-Socratic Lesson

In Topic B, students learn to identify the constant of proportionality by finding the unit rate in the collection of equivalent ratios. They represent this relationship with equations of the form  $y = kx$ , where  $k$  is the constant of proportionality (**7.RP.A.2**, **7.RP.A.2c**). In Lessons 8 and 9, students derive the constant of proportionality from the description of a real-world context and relate the equation representing the relationship to a corresponding ratio table or graphical representation (**7.RP.A.2b**, **7.EE.B.4**). Topic B concludes with students consolidating their graphical understandings of proportional relationships as they interpret the meanings of the points  $(0,0)$  and  $(1,r)$ , where  $r$  is the unit rate, in terms of the situation or context of a given problem (**7.RP.A.2d**).