



Topic A:

Finding the Whole

7.RP.A.1, 7.RP.A.2c, 7.RP.A.3

Focus Standard:	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. <i>For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.</i>
	7.RP.A.2	Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. <i>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 $t = pn$.</i>
	7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>
Instructional Days:	6	
Lesson 1:	Percent (P) ¹	
Lesson 2:	Part of a Whole as a Percent (P)	
Lesson 3:	Comparing Quantities with Percent (P)	
Lesson 4:	Percent Increase and Decrease (P)	
Lesson 5:	Finding One Hundred Percent Given Another Percent (P)	
Lesson 6:	Fluency with Percents (P)	

In Topic A, students build on their conceptual understanding of percent from Grade 6. They realize that a percent can be greater than 100% or less than 1%. They also realize that a percent can be a non-whole number such as $33\frac{1}{3}\%$, part of a complex fraction such as $\frac{33\frac{1}{3}}{100}$, or a simplified but equivalent fraction such as

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

$\frac{1}{3}$. They know 100% to be the whole and also equal to one. They use this conceptualization along with their previous understanding of ratios and proportional relationships from Module 1 to solve percent problems (**7.RP.A.2c**, **7.RP.A.3**). In Lesson 1, students revisit the meaning of the word *percent* and convert between fractions, decimals, and percents with a Sprint at the beginning of the lesson. As the lesson progresses, students use complex fractions to represent non-whole number percents; they also recognize that any percent greater than 100% is a number greater than one, and any percent less than 1% is a number less than one-hundredth. Students realize that, for instance, 350% means 350 for every 100, which equals 3.5, or $3\frac{1}{2}$, for every 1 (**7.RP.A.1**). In Lessons 2 and 3, students deepen their conceptual understanding of percent and the relationship between the part and the whole. They use a variety of models, including fractional representations, visual models (i.e., 10 by 10 grids and double number line diagrams), and algebraic models. As an algebraic representation, they use the formula $\text{Part} = \text{Percent} \times \text{Whole}$ to solve percent problems when given two terms out of three from the part, percent, and whole. Students continue to use this algebraic representation in Lesson 3 and write $\text{Quantity} = \text{Percent} \times \text{Whole}$ in situations where the part is larger than the whole. For instance, when expressing 250 as a percent of 200, they identify 200 as the whole, write $250 = p \cdot 200$, and solve the equation to reach a value of $p = 1.25$, which equals 125%. They relate their solution to a visual model, such as a double number line diagram, where 200 represents 100%, so 250 would represent 125%. Lesson 3 includes a percent Sprint, where students use mental math, patterns, place value, and the meaning of percent as *per hundred* to find specified percents of quantities such as 15% of 20, 30% of 20, etc.

Students advance their work with percents in Lesson 4 when they solve problems related to percent increase and decrease (**7.RP.A.3**). They continue to use algebraic representations and identify the whole in the context of the situation. In Lesson 5, students find one hundred percent when given another percent. They recognize that they can always find 1% of a quantity (by dividing it by 100 or multiplying it by $\frac{1}{100}$) and use 1% to find quantities represented by other percents. Students understand that an algebraic equation may not always be the most efficient way to solve a percent problem. They recognize factors of 100 and use mental math, proportional reasoning, and double number line diagrams to problem-solve as well. Topic A culminates with Lesson 6, where students solve various percent problems using the different strategies and complete a Sprint as they work toward fluency in finding the part, whole, and percent.