

## Mathematics in this Lesson

### Lesson 6: Solving Proportions Using Multiplication and Division

#### Lesson Description

Kate and Christopher make connections between their speed diagrams and the operations of multiplication and division. This helps give meaning to number sentences used to solve to proportion problems.

#### Math Content

[CCSS.M.7.RP.A.2.b](#) *Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.*

In this lesson, the students create diagrams and number sentences to show why the multiplicative comparison method works to calculate equivalent ratios that represent a constant speed. For example, the students create a diagram to show that a journey of a car that travels 200 miles at the same speed as a car traveling 10 miles in 4 minutes, is made of 20 groups of the 10 minutes in 4 minutes trip. The students connect the number of groups of the smaller trip to the numerical operation of multiplying both 10 miles and 4 minutes by 20, to determine that a car must complete a 200-mile journey in 80 minutes to go at the same speed as a car traveling 10 miles in 4 minutes.

#### Math Practices

**CCSS.MATH.PRACTICE.MP7**: *Look for and make use of structure.*

The Common Core Practice 4 states that mathematically proficient students “step back for an overview and shift perspective... and see complicated things...as single objects or as being composed of several objects.” In this lesson, Kate and Christopher continue to solve same speed tasks by iterating and partitioning a diagram showing the joined distance and time that represents the speed of a car traveling 10 miles in 4 minutes. As they solve a more challenging problem, they anticipate the number of little 10 miles in 4 minutes trips that go into a car’s longer journey of 65 miles that will make the two cars go at the same speed **[0:38 in Episode 4]**. They create a diagram of groups of 10 miles in 4 minutes trips to show that their guess works. They then connect the mathematically important features of their diagram to the features of their number sentence in several ways. They relate each number and symbol in their number sentences to the structure of their diagrams. They also draw “half” of a 10-miles-in-4-minutes trip to relate the diagram to the number of .5 in their number sentence **[5:37 in Episode 4]**.

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