Module 1: Thinking Proportionally

TOPIC 3: PROPORTIONALITY

In this topic, students learn about the constant of proportionality: the ratio between the two quantities being compared. They recognize that the constant is determined by the order of the ratio elements, and they use proportions to write and analyze direct variation equations. Students graph proportional relationships and determine the constant of proportionality from the graphs, interpreting this constant, the unit rate, in terms of the problem situation. Students practice determining if relationships are proportional, interpreting the meaning of linear proportional relationships, and determining and interpreting the constant of proportionality.

Where have we been?

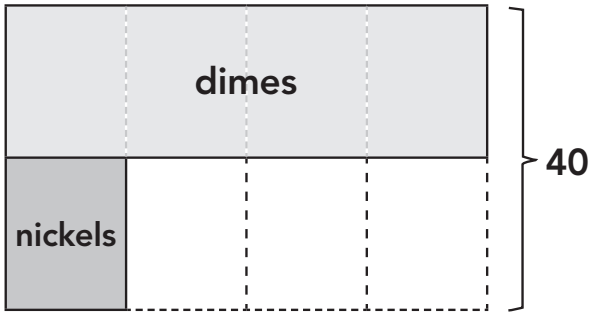
In grade 6, students developed a strong understanding of ratio and rate reasoning, including reasoning about equivalent ratios from graphs and tables. In the previous topic, students reviewed some of these basic ideas and developed a formal strategy for solving proportions.

Where are we going?

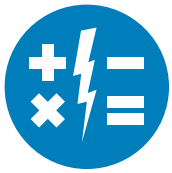
Students will continue to apply the constant of proportionality to solve multistep ratio and percent problems in the next topic. They will solve percent problems using the constant of proportionality and direct variation and relate the constant of proportionality to the scale factor in scale drawings. The characteristics of proportional relationships, their graphs, and their equations provide the underpinnings of algebra and the study of functions.

Using a Diagram to Represent a Proportional Relationship

The diagram shows that there are 4 times as many dimes as nickels. Also, the total number of coins (40) is 8 times the number of nickels and twice the number of dimes.



Myth: Asking questions means you don't understand.



It is universally true that, for any given body of knowledge, there are levels to understanding. For example, you might understand the rules of baseball and follow a game without trouble. But there is probably more to the game that you can learn. For example, do you know the 23 ways to get on first base, including the one where the batter strikes out?

Questions don't always indicate a lack of understanding. Instead, they might allow you to learn even more on a subject that you already understand. Asking questions may also give you an opportunity to ensure that you understand a topic correctly. Finally, questions are extremely important to ask yourself. For example, *everyone* should be in the habit of asking themselves, "Does that make sense? How would I explain it to a friend?"

#mathmythbusted

Talking Points

You can further support your student's learning by asking questions about the work they do in class or at home. Your student is learning to reason using proportions.

Questions to Ask

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? How do you know?
- Is there anything you don't understand? How can you use today's lesson to help?

Key Terms

direct variation

A situation represents a direct variation if the ratio between the *y*-value and its corresponding *x*-value is constant for every point.

constant of proportionality

In a proportional relationship, the ratio of all *y*-values to their corresponding *x*-values is constant. This ratio is called the constant of proportionality.