# **Ratios and Proportions Discussion Guide (for use during or after reading)**

1. What is a ratio? Write the ratio 3 cups of tea for every 2 guests in two different ways. (Ratios, p. 4-5)
   1. A ratio is a comparison between two amounts, or quantities. The ratio 3 cups of tea for every 2 guests can be written as 3:2 or .
2. Use what you know about equivalent ratios to solve the following problem. If the ratio of chocolate chips to cookies is 12 to 1, how many chocolate chips are there in 3 cookies? How many cookies are there if there are exactly 60 chocolate chips? (Equivalent Ratios, p. 8-9)
   1. In order to solve this problem, it can be helpful to think about equivalent ratios, or even equivalent fractions. The ratio 12 to 1 can be rewritten as which is equivalent to both and , so we know that 3 cookies would have a total of 36 chocolate chips, and 60 chocolate chips represents exactly 5 cookies.
3. What is a unit rate? Provide an example to support your answer. (Unit Rates, p. 10-11)
   1. A unit rate is a ratio that compares a quantity to one unit. For example, you might eat 3 vegetables per day. This is considered a unit rate because you are comparing the number of vegetables you eat to one day.
4. Explain how the tables on pages 12 and 13 were used to solve the problem. (Comparing Unit Rates, p. 12-13)
   1. The tables on pages 12 and 13 can be used to help solve this story problem because they provide an organized way of determining unit fractions to make comparing easier. For example, the tables easily show that the price of 1 of Mouse’s muffins is just $2 whereas the price of 1 of Rabbit’s muffins is $3.
5. What are proportional relationships? (Proportional Relationships, p. 14-15)
   1. A proportional relationship is one in which the ratio between the quantities is always constant, or the same. For example, for cookies that cost $1.50 a piece, the ratio of cost to cookie will always be 1.50 to 1.
6. What is a proportion? Solve this proportion for the variable, or unknown value: . (Writing and Solving Proportions, p. 16-19)
   1. A proportion is an equation that relates to equivalent ratios. In the proportion we can solve for the value of by using what we know about equivalent fractions. We can multiply by to get the equivalent fraction of , so we can say .
7. Right now, the grocery store has a deal: you can purchase 2 smoothies for a total of $3. Use what you know about unit rates to help you determine how much 5 smoothies will cost. (Unit Rates and Writing and Solving Proportions, p. 10-11 and 16-19)
   1. If 2 smoothies cost a total of $3, the unit rate for one smoothie is $1.50. We can use a ratio table to organize our thinking and determine the price of 5 smoothies as $7.50.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| $1.50 | $3.00 | $4.50 | $6.00 | $7.50 |

1. Explain how a percent can represent a unit rate. (Percents as Unit Rates per Hundred, p. 20-21)
   1. A percent is a number of things per one hundred. Percents are often thought of as unit rates because 100% is considered equivalent to 1 whole.
2. What percent of 50 is 30? (Calculating Percents, p. 28-29)
   1. In order to solve this problem, we can set up a proportion. . Because 50 x 2 = 100, we can multiply 30 by 2 to determine the value of . 30 x 2 = 60, so 30 is 60% of 50.
3. Currently, my travel mug contains 6 ounces of coffee and is 30% full. How much coffee can my entire mug hold? (Finding the Whole from a Part or Percent, p. 30-31)
   1. Students should find the answer to be 20 ounces.
   2. There are many ways to solve this problem, including using proportions. One way to solve this problem is by using a ratio table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6 ounces | 12 ounces | 18 ounces | 2 ounces | 20 ounces |
| 30% full | 60% full | 90% full | 10% full | 100% full |

* 1. We doubled the values to find 12 ounces = 60% and tripled the values to find 18 ounces = 90%. Because we need 100%, we know we must add however many ounces are equivalent to the last 10% to the 18 ounces that represent 90% of the mug. To find this, we can divide both 6 ounces and 30% by 3 and then add that to the 18 ounces and 90%. Using the ratio table helped us find that the mug can hold 20 ounces of coffee.