

Just In Time Quick Check
Standard of Learning (SOL) 6.12b

Strand: Patterns, Functions, and Algebra

Standard of Learning (SOL) 6.12b

The student will determine the unit rate of a proportional relationship and use it to find a missing value in a ratio.

Grade Level Skills:

- Identify the unit rate of a proportional relationship represented by a table of values or a verbal description, including those represented in a practical situation. Unit rates are limited to positive values.
- Determine a missing value in a ratio table that represents a proportional relationship between two quantities using a unit rate. Unit rates are limited to positive values.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [6.12ab – Ratio Tables and Unit Rates](#) (Word) / [PDF](#)
- VDOE Algebra Readiness Formative Assessments
 - [6.12b](#) (Word) / [PDF](#)
- VDOE Algebra Readiness Remediation Plans
 - [Ratio Tables and Unit Rates](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: [Grade 6](#) (Word) / [PDF](#)
 - Ratio Table
 - Proportional Relationship
 - Unit Rate: Definition
 - Unit Rate: Examples
 - Connecting Representations
- Desmos Activities
 - [Marcellus the Giant](#)
 - [Click Battle](#)
 - [Sugar Sugar](#)

Supporting and Prerequisite SOL: [6.1](#), [6.12a](#), [5.2a](#), [4.2b](#), [4.15](#)

SOL 6.12b - Just in Time Quick Check

1. Ava walked 36 dogs and earned \$72. The relationship between the number of dogs walked and the amount of money earned is proportional. What is the unit rate that represents this relationship?
2. This table represents a proportional relationship. What is the missing value in the table?

x	y
1	$\frac{7}{8}$
3	$2\frac{5}{8}$
5	$4\frac{3}{8}$
10	?

3. Jhalil and Bradley create videos at a constant rate each week. The proportional relationship between the number of videos created each week by Jhalil and Bradley is represented in the tables below. Complete the missing value in each ratio table.

Jhalil	
Videos	Week(s)
?	1
48	4
96	8
120	10

Bradley	
Videos	Week(s)
?	1
18	2
27	3
54	6

What is the unit rate that represents the relationship in each table? Explain your thinking.

4. Mehret ran in her neighborhood.
- She recorded the distance, in miles, she ran.
 - She recorded the number of minutes she ran.
 - The relationship between the number of miles she ran and number of minutes she ran is proportional.

Distance Mehret Ran

Number of Minutes	1	4	8	12
Distance (Miles)	?	$\frac{1}{2}$	1	$1\frac{1}{2}$

Based on the proportional relationship, what is the total distance that Mehret ran in 1 minute?

5. A store has two different brands of trash bags. Each table represents a proportional relationship. Which brand of trash bags is the better deal? Explain your thinking.

Brand A Trash Bags

Cost (in Dollars)	?	4.80	13.44
Number of Trash Bags	1	30	84

Brand B Trash Bags

Cost (in Dollars)	?	4.08	16.32
Number of Trash Bags	1	24	96

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Common Errors/Misconceptions and their Possible Indications

1. Ava walked 36 dogs and earned \$72. The relationship between the number of dogs walked and the amount of money earned is proportional. What is the unit rate that represents this relationship?

A common error some students may have is describing the meaning of the unit rate. Some students may obtain an answer of "2" but not understand if it is two dollars or two dogs. This may indicate that a student has difficulty interpreting the meaning of a unit rate in the context of a practical situation. For example, a student may use manipulatives to model the relationship between the number of dogs walked and the amount of money earned to form groups will provide a concrete example to determine the unit rate. Teachers may wish to scaffold examples and begin with smaller numbers using manipulatives.

2. This table represents a proportional relationship. What is the missing value in the table?

x	y
1	$\frac{7}{8}$
3	$2\frac{5}{8}$
5	$4\frac{3}{8}$
10	?

A common misconception a student may make is to use the increase in the values in the y-column from the completed rows in the table resulting in $1\frac{3}{4}$. This may indicate that a student is seeing the progression as an additive relationship and applying that to find the missing value for 10. Double number line diagrams can also be used to represent proportional relationships and create collections of pairs of equivalent ratios. To help students think about multiplicative reasoning, allow them to explore both types of relationships. This should also be embedded in the work of 6.12c as students are determining whether a relationship is proportional. In addition, allow students to use context in conjunction with manipulatives to model the proportional relationship.

3. Jhalil and Bradley create videos at a constant rate each week. The proportional relationship between the number of videos created each week by Jhalil and Bradley is represented in the tables below. Complete each ratio table.

Jhalil	
Videos	Week(s)
?	1
48	4
96	8
120	10

Bradley	
Videos	Week(s)
?	1
18	2
27	3
54	6

What is the unit rate that represents the relationship in each table? Explain your answer.

A common misconception a student may make is to reverse the ratio of the unit rate. This may indicate that a student believes the unit rate can be determined by dividing the number of weeks by the number of videos created obtaining a unit rate of $\frac{1}{12}$ for Jhalil and $\frac{1}{9}$ for Bradley. In addition, this may indicate that a student struggles with connecting the meaning of finding unit rates in a contextual situation. Consider having students create models alongside their ratio tables and add labels as they go. For example, a student may draw three circles and label them "weeks" to represent weeks and place the accompanying number of videos per week, 9, in each of the three circles. Sentence frames, (examples below), can also support students' explanations and connecting reasoning to the unit rates:

- *This unit rate makes sense because...*
- *The unit rate comes from...*
- *1 _____ is worth _____ because...*
- *If he made videos for 3 weeks, he would make _____ per _____ because...*

4. Mehret ran in her neighborhood.
- She recorded the distance, in miles, she ran.
 - She recorded the number of minutes she ran.
 - The relationship between the number of miles she ran and number of minutes she ran is proportional.

Distance Mehret Ran

Number of Minutes	1	4	8	12
Distance (Miles)	?	$\frac{1}{2}$	1	$1\frac{1}{2}$

Based on the proportional relationship, what is the total distance that Mehret ran in 1 minute?

A common error some students may have is solving for the unit rate by working backwards using an additive relationship. In this problem, a student may start at $1\frac{1}{2}$ and subtract $\frac{1}{2}$ backwards to arrive at an answer of “0.” This may indicate that a student does not understand that a proportional relationship represents a multiplicative situation. To help students move to multiplicative reasoning, allow them to explore both types of relationships in more depth comparing an additive situation to a multiplicative situation. This should also be embedded in the work of 6.12c as students are determining whether a relationship is proportional. In addition, providing context and manipulatives to model the proportional relationship can help support students in understanding this concept. Using fraction strips or fractions bars in the conjunction with the context of running would allow students to make the connection between the ratio table and a more concrete model. Consider asking the following questions to help students see this connection and understand the context: How does the model change the more Mehret runs? How is running $\frac{1}{2}$ a mile in 4 minutes the same as running 1 mile in 8 minutes? How is it different?

5. A store has two different brands of trash bags. Each table represents a proportional relationship. Which brand of trash bags is the better deal? Explain your thinking.

Brand A Trash Bags

Cost (in Dollars)	?	4.80	13.44
Number of Trash Bags	1	30	84

Brand B Trash Bags

Cost (in Dollars)	?	4.08	16.32
Number of Trash Bags	1	24	96

A common misconception some students may make is to determine the unit rate as the difference between the cost values in the table. For example, a student may find the difference of the cost in Brand A as \$8.64 and the difference of the cost in Brand B as \$12.24. This may lead a student to justify that the better deal is Brand A trash bags but for the wrong reason since the student did not compare the unit rates. This is why it is important for students to explain their answer in order for teachers to determine this misconception. Sharing ideas and strategies among peers in a “number talk” is an experience from which all students would benefit. It allows them to explore other methods of solving that a classmate suggests. It is important to give them many opportunities to apply unit rates in context. Teachers may wish to have students create models with the ratio tables.