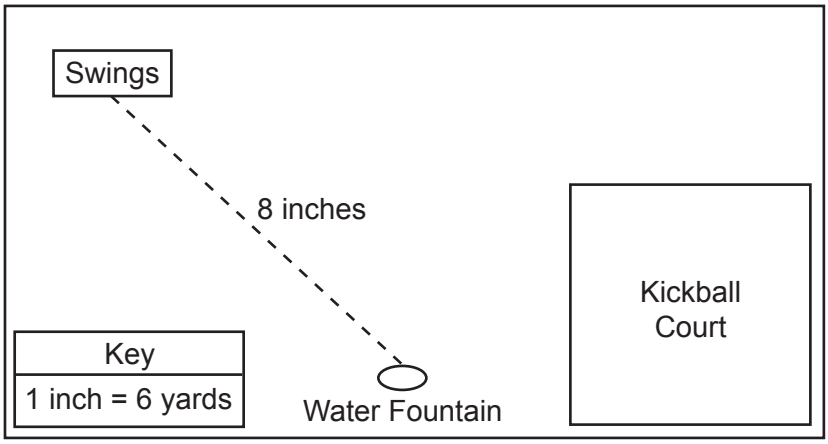
Tennessee Comprehensive Assessment Program / Mathematics

TCAP/CRA 2012-2013

Task 1: Playground Task Full Scoring Guide

Task 1. Playground Task

Carlos is looking at a map of his school's playground.



Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

GO ON TO THE NEXT PAGE.

1. Playground Task Scoring Guide

The CCSS for Mathematical Content (3 points)

6.RP.1	The student uses ratios and/or ratio language that accurately describes the situation in responding to the question.	_____
6.RP.3b	The student uses ratio and rate reasoning to accurately determine the number of feet.	_____
6.RP.3d	The student uses ratio and rate reasoning to transform units.	_____

Total Content Points _____

The CCSS for Mathematical Practice (4 points)

MP1	The student uses ratio and/or ratio language to indicate that rates can be scaled up or down, and uses an equation to show conversion between units of measure; the student attends to all parts of the task. (MP1: Make sense of problems and persevere in solving them.)	_____
MP3	The student communicates that converting a measure on a map to a real world measure requires using a scale factor and that converting from one unit to another requires using a conversion fact. (MP3: Construct viable arguments and critique the reasoning of others.)	_____
MP4	The student uses ratios, tables, and/or equations or expressions to make scale conversions and unit conversions of measurements. (MP4: Model with mathematics.)	_____
MP6	The student accurately refers to the diagram, writes correct equations, and labels the quantities in both conversions correctly. (MP6: Attend to precision.)	_____

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.1 Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

6.RP.3b Solve unit rate problems, including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

6.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

Task 1. Playground Task

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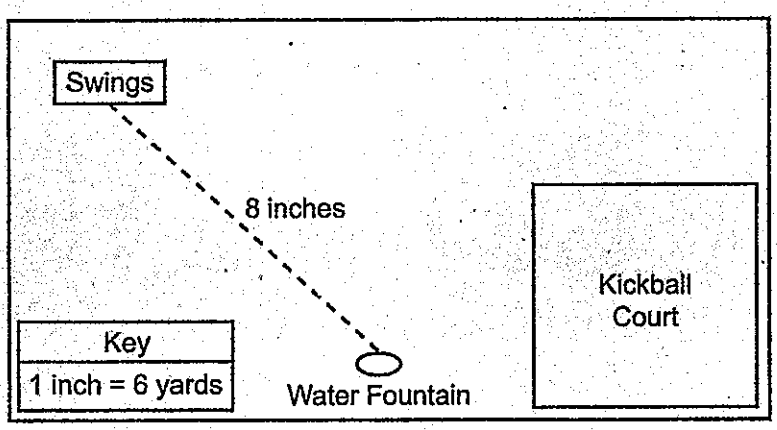

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

GO ON TO THE NEXT PAGE.

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

The key shows that 1 inch is equal to 6 yards. There is 8 inches from the fountain to the swing so you multiply 8 x 6 to find how many yards there are. That is equal to 48 yards, so now you multiply 48 times 3 since there is 3 feet in each yard. Therefore there are 144ft all the way to the swings from the fountain.

$\frac{6 \text{ yards}}{1 \text{ inch}} = \frac{x}{8 \text{ in.}} \quad 48 = 1x \quad 48 = x \quad x = 48 \text{ yards}$

$48 \times 3 = 144 \text{ Ft}$

$144 \times 12 = 1728 \text{ in}$

$144 \times 12 = 288 + 1440 = 1728$

Guide 1 Litho 5539

Total Content Points: 3 (6.RP.1, 6.RP.3b, 6.RP.3d)

Total Practice Points: 3 (MP1, MP3, MP4)

In this response, the student uses ratios and ratio language that accurately describes the given information, stating "$\frac{6 \text{ yards}}{1 \text{ inch}} = \frac{x}{8 \text{ in.}} = x = 48 \text{ yds}$" (6.RP.1). The student uses ratio and rate reasoning to transform from yards to feet and to determine the correct number of feet (6.RP.3b, 6.RP.3d). The student recognizes that rates can be scaled up and attends to all tasks (MP1). The student communicates that converting a measure on a map to a real world measure requires using a scale factor and that converting from one unit to another requires using a conversion fact ("48 x 3") (MP3). The student uses equations and expressions to make scale conversions and unit conversions of measurements (MP4). However, the solution shown includes an incorrect equation, indicating insufficient attention to precision (no credit for MP6).

Total Awarded Points: 6 out of 7

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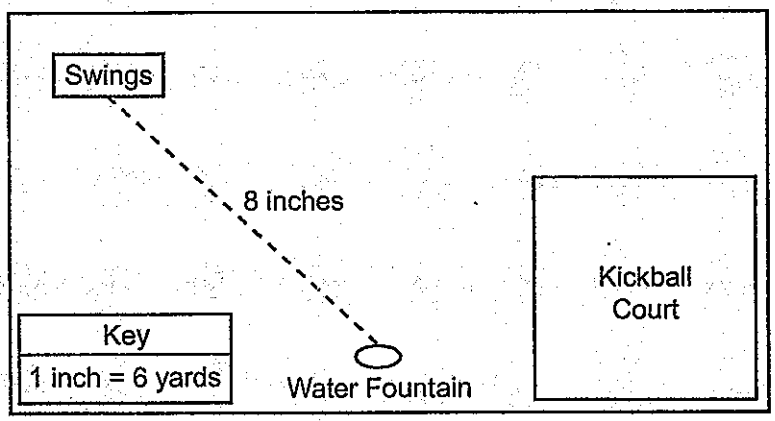

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

144ft to 8in.

$48 \times 3 = x$

$x = 144$ft

8
×6
48ft

1 inch on the map equals 6 yards. There are 8 inches between the swings and the water fountain. So you times 8 by 6 and get 48 yards. Then you times 48 by 3 because there are 3 feet in a yard. You get 144ft. So there are 144ft between the swings and water fountain.

Guide 2 Litho 5309

Total Content Points: 3 (6 RP.1, 6.RP.3b, 6.RP.3d)

Total Practice Points: 3 (MP3, MP4, MP6)

The student uses ratio language, “1 inch on the map equals 6 yds,” to describe the problem (6.RP.1). The student uses ratio and rate reasoning to determine the number of feet (“3 feet in a yard”) (6.RP.3b). The student uses ratio and rate reasoning to transform yards to feet (6.RP.3d). The student does not include a ratio in the response, which is required to complete all parts of the task (no credit for MP1). In the explanation, the student communicates that converting a measure on a map to a real world measure requires using a scale factor and that converting from one unit to another requires using a conversion fact (MP3). The student uses equations and expressions to make scale conversions (MP4). The student accurately refers to the diagram, writes correct equations, and labels quantities in both conversions correctly (MP6).

Total Awarded Points: 6 out of 7

Task 1. Playground Task

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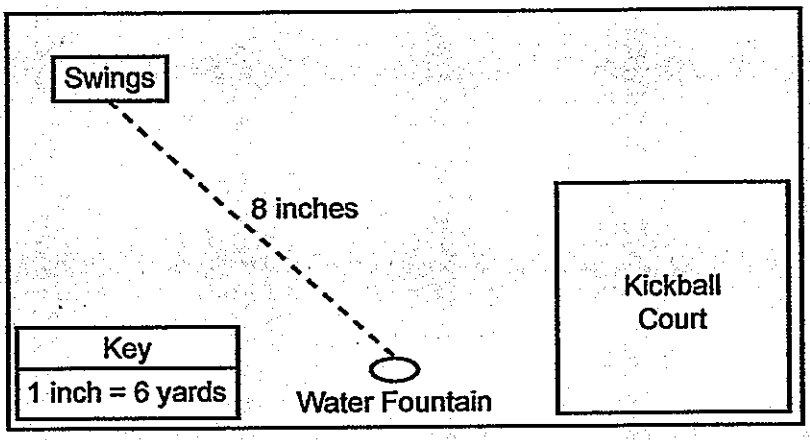
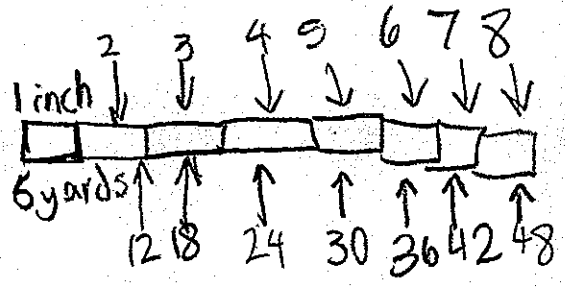


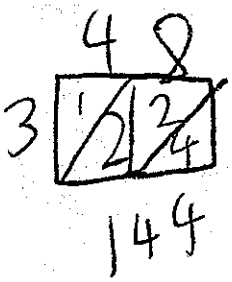
Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard





48 yards
× 3
144 feet

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

GO ON TO THE NEXT PAGE.

Guide 3 Litho 5103

Total Content Points: 3 (6.RP.1, 6.RP.3b, 6.RP.3d)

Total Practice Points: 2 (MP4, MP6)

This student uses ratios in a table from $\frac{1 \text{ inch}}{6 \text{ yards}}$ to $\frac{8}{48}$ (6.RP.1). The student uses ratio and rate reasoning to determine the correct number of feet and to transform yards to feet (6.RP.3b, 6.RP.3d). The student does not attend to all parts of the task as no equation is shown (no credit for MP1). The work shown is considered insufficient to fully communicate that converting a measure on a map to a real world measure requires using a scale factor and that converting from one unit to another requires using a conversion fact (no credit for MP3). The student uses a table to make scale conversions (MP4). The student accurately refers to the diagram, writes correct equations, and labels all quantities (MP6).

Total Awarded Points: 5 out of 7

Task 1. Playground Task

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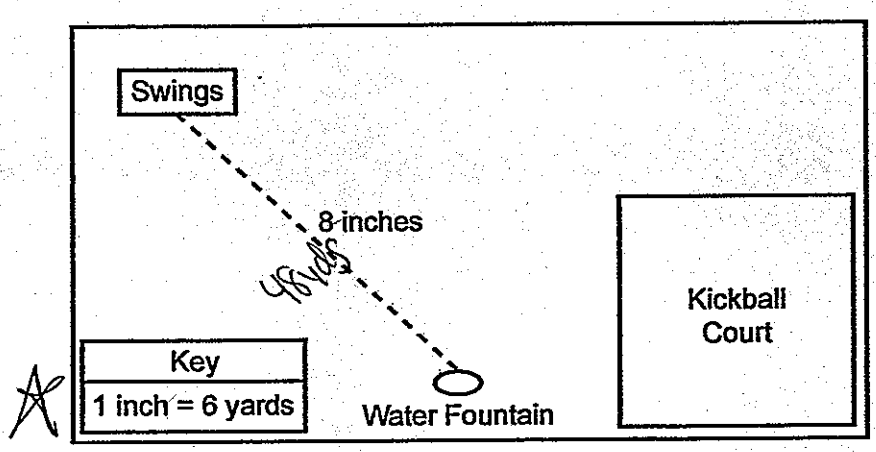

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

48 yds = 16ft

Litho#: 5165

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

Carlos was 8 ins. away from the water fountain and it 6 yards per inch. so it inches to yards $\frac{1}{6}$. Really it 8:6 and the answer is 48. There is 3 feet every yards. Its 48 ÷ 3 equal 16. The answer 16 feets.

*1in every 6 yards

8 · 6 = 48 8 in = 48 yds.

48 ÷ 3 = 16 48 yd = 16 ft.

16 feet

Guide 4 Litho 5165

Total Content Points: 1 (6.RP.1)

Total Practice Points: 3 (MP1, MP3, MP4)

This student uses ratios and ratio language to describe the problem (6.RP.1), but does not determine the correct number of feet, incorrectly applying the conversion fact between feet and yards (no credit for 6.RP.3b, no credit for 6.RP.3d). The student recognizes that rates can be scaled up and attends to all parts of the task (MP1). The student communicates that converting a measure on a map to a real world measure requires using a scale factor and that converting from one unit to another requires using a conversion fact, even though the conversion fact is incorrectly used in the response (MP3). The student uses equations and expressions to make scale conversions (MP4), but some incorrect work is included (no credit for MP6).

Total Awarded Points: 4 out of 7

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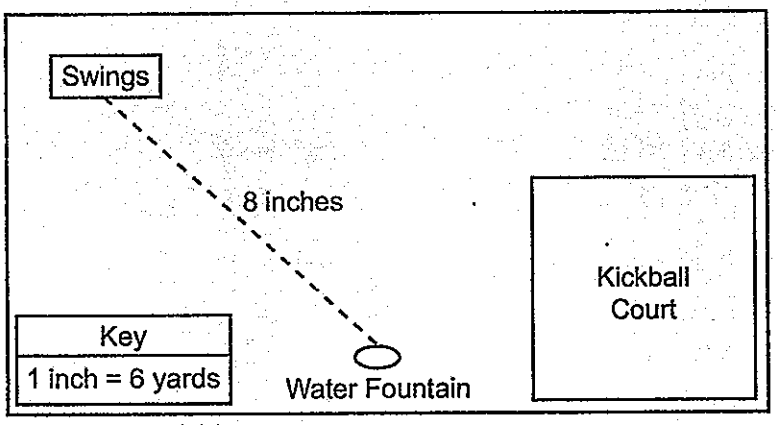

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

12 in = 1 foot

3 feet = 1 yard

Distance from swings to water fountain

– 8 inches

KEY:

1 inch = 6 yards

$\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \text{ yards} \end{array}$

$3(8 \cdot 6)$

$3(48)$

144 ft

48 y

144 ft

Guide 5 Litho 5187

Total Content Points: 2 (6.RP.3b, 6.RP.3d)

Total Practice Points: 2 (MP4, MP6)

This student uses ratio reasoning to determine the correct number of feet ("$\frac{48 \text{ y}}{144 \text{ ft}}$") and to transform yards to feet (6.RP.3b, 6.RP.3d). However, the response does not contain a ratio or clear ratio language in describing the situation or in finding the solution (no credit for 6.RP.1). The student does not attend to all part of the task, as there is no ratio shown (no credit for MP1). The student does not construct a viable argument that converting a measure on a map to a real world measure requires using a scale factor or that converting from one unit to another requires using a conversion fact (no credit for MP3). The student uses correct equations to model unit conversions of measurements ("3(8 • 6) = 3(48) = 144 ft") and accurately refers to the diagram and labels quantities in both conversions correctly (MP4, MP6).

Total Awarded Points: 4 out of 7

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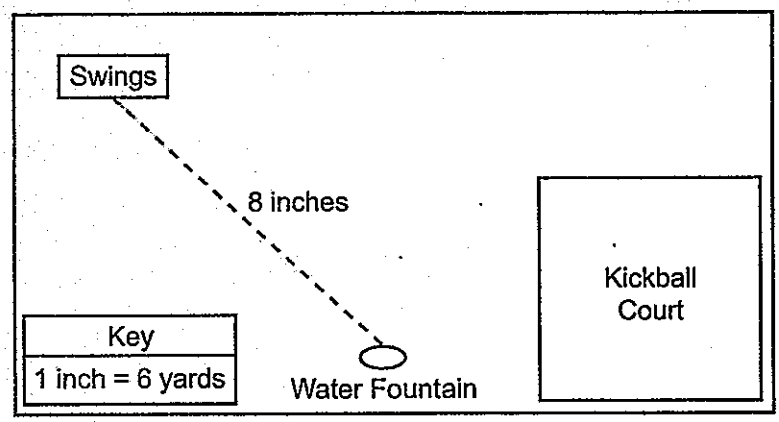

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Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

Carlos needs to walk from the swings to the water fountain and he needs to know how long in feet it is. He drew up a map and from the swings to the water fountain was 8 inches. If 1 inch equals 6 yards how many feet is it. It is a 3:1 ratio. You mutiply 6 by 8 and get 42. Mutiply this by 3 and get 144 feet. This is how far he must walk.

Guide 6 Litho 5181

Total Content Points: 3 (6.RP.1, 6.RP.3b, 6.RP.3d)

Total Practice Points: 0

This student uses ratio language in response to the question (“3:1”) (6.RP.1). Ratio and rate reasoning are used to determine the correct number of feet (“mutiply this by 3 and get 144 feet”) (6.RP.3b). The student uses ratio and rate reasoning to transform yards to feet (6.RP.3d). As the student does not use at least one equation, all parts of the task are not attended to (no credit for MP1). No viable argument is constructed to communicate the need to use a scale factor when converting a measure on a map to a real world measure, or the need to use a conversion fact when converting from one unit to another (“3:1 ratio . . . mutiply 6 by 8 and get 42. Mutiply this by 3 and get 144 feet”) (no credit for MP3). No models to scale up conversions or unit conversions of measurements are used (no credit for MP4). Incorrect equations are used (“mutiply 6 by 8 and get 42”) (no credit for MP6).

Total Awarded Points: 3 out of 7

Task 1. Playground Task

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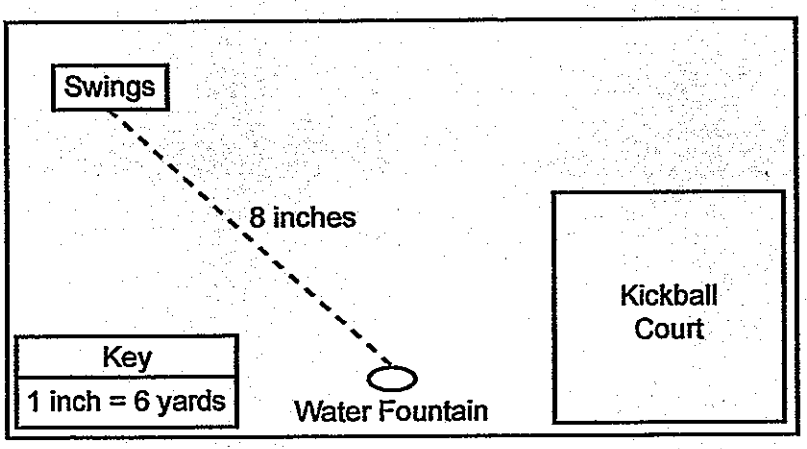

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

6 yards • 8 inches = 48 yards ÷ 12 in.

144 feet

If there three feet in one yard there is 144 feet in 48 yards.

Guide 7 Litho 5151

Total Content Points: 3 (6.RP.1, 6.RP.3b, 6.RP.3d)

Total Practice Points: 0

In this response the student uses ratio language in responding to the question (“if there three feet in one yard there is 144 feet in 48 yards”) (6.RP.1). The student uses ratio and rate reasoning to determine the correct number of feet (“144 feet”) (6.RP.3b). Ratio and rate reasoning are used to change yards to feet (“3 ft to 1 yd, 144 ft in 48 yds”) (6.RP.3d). As the student does not explain the reasoning used in words, all parts of the task are not attended to (no credit for MP1). The student does not communicate the need to use a scale factor when converting from measurements on a map to real world measures, or the need to use a conversion fact when converting from one unit to another (no credit for MP3). A correct mathematical model in unit conversions of measurements is not used (“48 yards ÷ 12 in = 144 feet”) (no credit for MP4). The student does not write correct equations (no credit for MP6).

Total Awarded Points: 3 out of 7

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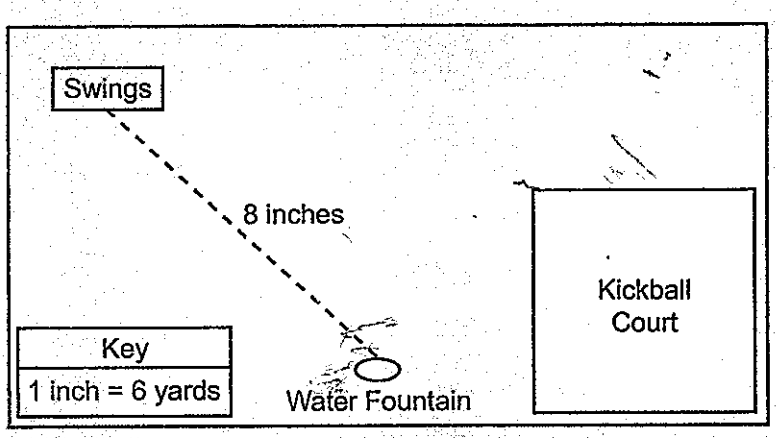

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

inches / yards: $\frac{1}{6} = \frac{8}{4}$ inches / yards

$6 \cdot 8 = 14 = \frac{48}{1} = 48$ feet

$(6 \cdot 8) \div 1 = 48$

$48 \div 1 = 48$

48 feet

The actual distance from the swings to the water fountain is 48 ft. (forty-eight feet)

 GO ON TO THE NEXT PAGE.

Guide 8 Litho 5259

Total Content Points: 1 (6.RP.1)

Total Practice Points: 1 (MP4)

The student uses a ratio to respond to the question by stating "$\frac{1 \text{ inches}}{6 \text{ yards}} = \frac{8 \text{ inches}}{y \text{ yards}}$" (6.RP.1).

The student neither determines the correct number of feet nor uses ratio or rate reasoning to transform yards to feet (no credit for 6.RP.3b, no credit for 6.RP.3d). The response does not contain an explanation in words of the process used to find the solution, so the student has not attended to all parts of the task (no credit for MP1). The student does not convert from one unit to another using a conversion fact, and does not find the correct solution to the problem, stating the answer is 48 feet rather than yards (no credit for MP3, no credit for MP6). The student uses ratios to make scale conversions (MP4).

Total Awarded Points: 2 out of 7

Task 1. Playground Task

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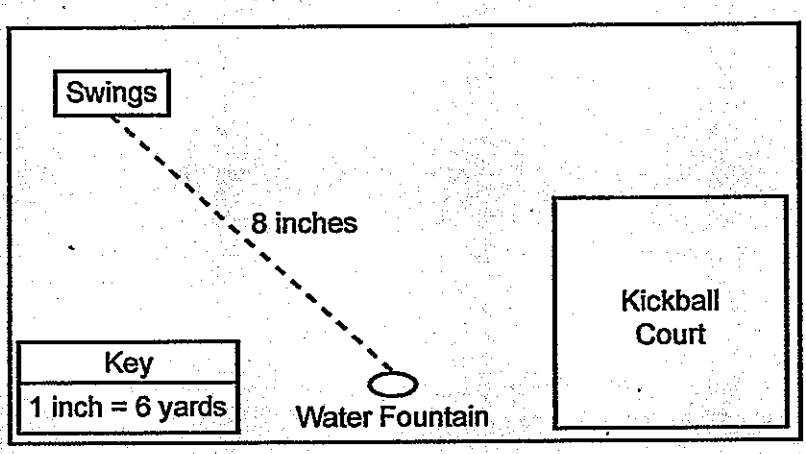

Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

You would put x over 6 and that it equals 8. You will multiply 6x8 and get 48 which equals x.

$\frac{x}{6} = 8$

$x = 48$

Guide 9 Litho 5123

Total Content Points: 1 (6.RP.1)

Total Practice Points: 0

This student uses ratios to respond to the question ("$\frac{x}{6} = 8;\ x = 48$") (6.RP.1). The student does not use ratio or rate reasoning to determine the correct number of feet or to transform yards to feet (no credit for 6.RP.3b, no credit for 6.RP.3d). The student does not attend to all parts of the task (no credit for MP1). The student does not fully communicate that converting from one unit to another requires using a conversion fact (no credit for MP3), and the student does not model unit conversions of measurements (no credit for MP4). The student does not label any part of the answer (no credit for MP6).

Total Awarded Points: 1 out of 7

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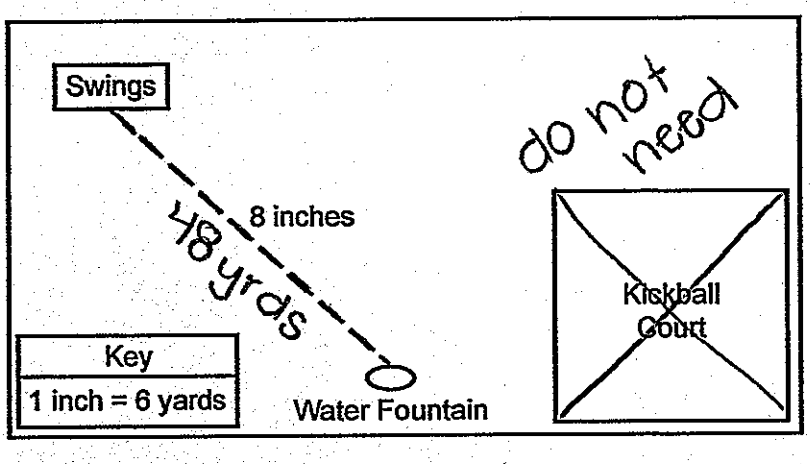


Carlos decides to find the actual distance, in feet, from the swings to the water fountain. He measures the distance from the swings to the water fountain on the map and finds that the distance is 8 inches.

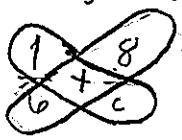
Carlos remembers the following facts about distances:

12 inches = 1 foot

3 feet = 1 yard

Help Carlos find the actual distance from the swings to the water fountain in feet. Explain your reasoning in words. Use at least one ratio and at least one equation in your explanation.

Carlos can find the actual distances by Mutiplying the inch by times how many a inch is in yards.



$1c = 48$

Guide 10 Litho 5133

Total Content Points: 0

Total Practice Points: 0

This response does not contain a logical ratio describing the situation (no credit for 6.RP.1). The student does not use ratio or rate reasoning to determine the correct number of feet or to transform yards to feet (no credit for 6.RP.3b, no credit for 6.RP.3d). Although the student attempts to explain the reasoning used in words, the explanation is limited and the need to use a scale factor when converting from a map measure to a real world measure is not addressed, and therefore the student does not attempt all parts of the task (no credit for MP1, no credit for MP3). The student does not use a correct model for scale conversions (no credit for MP4). The student does not write correct equations or label both conversions correctly (no credit for MP6).

Total Awarded Points: 0 out of 7