

# NWEA Assessment Item Illustrating 6.EE.C.9

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**Domain:** Expressions and Equations

**6.EE.C:** Represent and analyze quantitative relationships between dependent and independent variables.

**Calculator Availability:** Yes

Use the information to complete the task.

The table shows the number of cups of raspberries,  $r$ , needed to make  $p$  pies using a baker's recipe.

|                                       |   |    |    |    |    |
|---------------------------------------|---|----|----|----|----|
| Number of Pies ( $p$ )                | 1 | 8  | 12 | 16 | 20 |
| Number of Cups of Raspberries ( $r$ ) | 3 | 24 | 36 | 48 | 60 |

Choose "True" or "False" for each statement about the baker's recipe.

| Statement                                                                                                                                                                                        | True or False? |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|
| 6 cups of raspberries are needed for 2 pies.                                                                                                                                                     | True           | False |
| 24 pies are made using 8 cups of raspberries.                                                                                                                                                    | True           | False |
| The equation $p = 3r$ represents the relationship between $r$ and $p$ .                                                                                                                          | True           | False |
| The point (2, 6) would be on the graph that shows the relationship between the number of pies (shown on the horizontal axis) and the number of cups of raspberries (shown on the vertical axis). | True           | False |

**Alignment: 6.EE.C.9:** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation  $d = 65t$  to represent the relationship between distance and time.*

Representing and analyzing quantitative relationships is the foundation for modeling with mathematics in both algebra and statistics. This standard establishes the notion of dependence and independence, and in this item, students interpret and analyze the relationship between quantities presented in a table in order to complete the task correctly.

**Coherence:** Throughout grades K–5, students used expressions to represent word problems in the Operations and Algebraic Thinking domain. In grade 5, students generated two numerical patterns using two given rules and identified apparent relationships between corresponding terms.<sup>5.OA.B.3</sup> In grade 6, students need to represent a real-world scenario with a one-step algebraic expression or equation. In this grade 6 standard, students begin to use tabular and graphical representations to model the relationship between varying quantities. In grade 7, students will extend this work to develop the concept of a proportional relationship, representing proportional relationships as equations and identifying the constant of proportionality as the unit rate in tables, graphs, and equations.<sup>7.RP.A.2</sup> In the work of grade 8, students will extend their understanding of proportional relationships to model with linear functions<sup>8.F.A/B</sup> and to develop slope understanding.<sup>8.EE.B</sup>

**Rigor:** This item attends to conceptual understanding and application. Students use the concept of a variable and the numbers in the table to identify true statements about the context. This item requires a straightforward application of mathematics in a familiar, real-world scenario.

## Answer Key:

Use the information to complete the task.

The table shows the number of cups of raspberries,  $r$ , needed to make  $p$  pies using a baker's recipe.

|                                       |   |    |    |    |    |
|---------------------------------------|---|----|----|----|----|
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Choose "True" or "False" for each statement about the baker's recipe.

| Statement                                                                                                                                                                                        | True or False?                           |                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|
| 6 cups of raspberries are needed for 2 pies.                                                                                                                                                     | <input checked="" type="checkbox"/> True | False                                     |
| 24 pies are made using 8 cups of raspberries.                                                                                                                                                    | True                                     | <input checked="" type="checkbox"/> False |
| The equation $p = 3r$ represents the relationship between $r$ and $p$ .                                                                                                                          | True                                     | <input checked="" type="checkbox"/> False |
| The point (2, 6) would be on the graph that shows the relationship between the number of pies (shown on the horizontal axis) and the number of cups of raspberries (shown on the vertical axis). | <input checked="" type="checkbox"/> True | False                                     |

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