

Just In Time Quick Check
Standard of Learning (SOL) 5.19d

Strand: Patterns, Functions, and Algebra

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The student will create a problem situation based on a given equation, using a single variable and one operation.

Grade Level Skills:

- Create and write a word problem to match a given equation with a single variable and one operation.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [Variables, Operations, Numbers, Oh My!](#) (Word) / [PDF](#)
- VDOE Algebra Readiness Formative Assessments
 - [5.19d](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: [Grade 5](#)
 - Expression
 - Variable Expression
 - Equation
 - Equality
 - Inequality
- Desmos Activity
 - [Variables](#)

Supporting and Prerequisite SOL: [5.19a](#), [5.19b](#), [5.19c](#), [4.16](#), [3.17](#)

SOL 5.19d - Just in Time Quick Check

1. For each of the following, create a word problem that matches the equation.

| Equation | Word Problem |
|---------------------|--------------|
| $2 + m = 6$ | |
| $3x = 33$ | |
| $20 = \frac{60}{y}$ | |
| $1 = 5 - p$ | |
| $8 = 6 + w$ | |

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Common Errors/Misconceptions and their Possible Indications

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The following misconceptions are common challenges students face when interpreting a variable and connecting it to word problems:

-Understanding what a variable means: Students see variables in many different ways as they go through elementary school: in formulas such as $A = l \times w$, as an open box where it represents a quantity, and as a part of input and output tables. Letters are also used to represent specific words, like “m” for “meter.” This can cause much confusion for students about what the letters they are seeing in mathematics actually mean. For example, in the first equation, m is representing a value of something in a story but it does not have to be “meters.” Additionally, a student might look at $3x$ and think that this means the story context will have 3 of variable x (maybe 3 cookies) instead of 3 TIMES the number of cookies. In addition, students may confuse the variable x with the multiplication symbol “x.”

Variables are also used as labels in geometry, such as with angles. Teachers may wish to compare examples of variables used in many formulas, such as area/perimeter versus when it is used as an abbreviation for units. Be sure to use variables other than “x” so students will understand there are other ways to represent multiplication, such as a dot or parentheses. Have students define the variable in the equation and in their story problem and revisit the work from 5.19a. Encourage students to use scenarios that do not always match the letter in the equation that represents the variable. Ask students to explain how their context and equation represent the missing number.

-Understanding the relationship between an equation and a context: It is important for students to have conversations about whether or not their stories match the given equation. Similarly to the work in 5.19c, this is a place where students could sort and/or create examples and non-examples of context that connect to the equation and contexts that do not.

Additionally, it is helpful to have students say the meaning of the equation in their own words before starting a story problem. Have them write the meaning of the equation first. Then ask students about relationships in their equations. For example, in the equation $20 = \frac{60}{y}$, what is the relationship between 60 and y? How about 20 and y? How do you know? Which is fewer/greater?

-Understanding equality: For example, in $1 = 5 - p$ a student might think this is impossible. They are working under the incorrect assumption that “equal” means, “answer.” It is imperative to have students work with balance scales in conjunction with open sentences to develop the connection between “equality” and “balanced.” Students can use models to show how their story problems and equations can be represented in terms of balance. For the example above, a student might show one cookie on the right side of a balance scale with $5 - p$ cookies on the other side. These are the same!

Students may also think that an equation is not written correctly when the addition/subtraction symbol is to the right of the equal sign. It would be beneficial to students to include many variations of formats in equality. Daily Number Talks are a great way to engage students in mental mathematics for fluency and it allows the teacher to record equations in varied ways. Additionally, have students write equations in more than one way in connection to the models that they are working with across this standard.