

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

Strand: Patterns, Functions, and Algebra

Standard of Learning (SOL) 5.19b

The student will write an equation to represent a given mathematical relationship, using a variable.

Grade Level Skills:

- Write an equation with addition, subtraction, multiplication, or division, using a variable to represent an unknown quantity.

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Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [5.19a - Variables, Operations, Numbers, Oh my](#) (Word) / [\(PDF\)](#)
- VDOE Algebra Readiness Formative Assessment
 - [SOL 5.19b](#) (Word) | [\(PDF\)](#)
- VDOE Algebra Readiness Remediation Plans
 - [Creating Equations - Scenario Cards](#) (Word) | [\(PDF\)](#)
- VDOE Word Wall Cards: Grade 5 [\(Word\)](#) | [\(PDF\)](#)
 - Expressions
 - Variable Expressions

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

SOL 5.19b - Just in Time Quick Check

1. Write an equation to represent the unknown quantity. Allison had eight cookies. She gave three to her brother. How many cookies does she have left?
2. Kathleen has three times as many seashells in her collection as her friend Gabby. Gabby has 15 seashells. Write a number sentence that could be used to find k , the number of seashells that Kathleen has?
3. Tina wants to sell 30 items for the fundraiser. She knows that she has 5 days left to sell. Write an equation to find how many items she must sell per day in order to reach her goal.
4. Write an equation to represent the unknown quantity. Bella brought stickers to school to give to 12 of her friends. Each friend received 4 stickers. How many stickers did Bella bring to school? Let " s " represent the number of stickers Bella brought to school.
5. Tony has twice as many baseball cards in his collection as his friend Antwon. Antwon has 32 baseball cards. Write a number sentence that could be used to find x , the number of baseball cards that Tony has?

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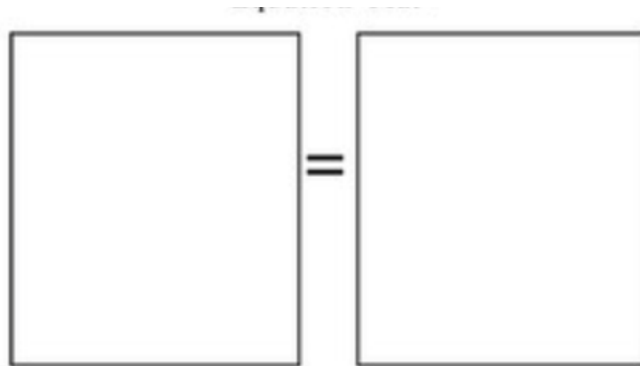
Common Errors/Misconceptions and their Possible Indications

1. Write an equation to represent the unknown quantity. Allison had eight cookies. She gave three to her brother. How many cookies does she have left?

A student may have trouble setting up the equation and understanding that since Allison is giving her cookies away, the operation is subtraction. Some students may need to use a box or a line for the unknown number first and then replace it with a variable. The use of manipulatives to set the problem up would be a great tool so that the student can act out what is occurring within the problem. A graphic organizer such as the one below would also be beneficial.



Because stories can utilize a variety of equality and expression structures, consider graphic organizers that accommodate for these structures. Equation mats are helpful graphic organizers because the total/parts can go on either side of the mat.



A more concrete model that could be used to set up an equation would be a balance scale, shown below. Consider what the student would use for variables and what they would use for constants.



2. Kathleen has three times as many seashells in her collections as her friend Gabby. Gabby has 15 seashells. Write a number sentence that could be used to find k , the number of seashells that Kathleen has?
A student may have trouble writing an equation when the variable (k) is already given because they struggle determining where to place the unknown variable within the equation. The use of 15 manipulatives (chips, etc. to represent the seashells) would be a great starting point for the student. A graphic organizer would also be a great tool for the student to organize the equation using the appropriate operation.

**See 5.19c for ways to help students connect contexts to number lines and questions to ask to help students to understand the relationships between their story and the equation they are writing.*

3. Tina wants to sell 30 items for the fundraiser. She knows that she has 5 days left to sell. Write an equation to find how many items she must sell per day in order to reach her goal.
In this case, the student may see “how many,” as a keyword and decide that the operation is addition rather than division. Encourage them to think about what is taking place within the statement. The use of manipulatives to set the problem up would be a great tool so that the student can act out what is occurring within the problem. A graphic organizer would also be beneficial. A student would also benefit from exposure to equations that use division as the operation.

If students are jumping straight to key words, Numberless Word Problems are a great tool to help students practice visualizing contexts of story problems. Numberless Word Problems engage students in a process of looking at part of a story, thinking critically about it, then adding in more to the story. This can be scaffolded across problems. For example, the teacher might cover up all of the story problem (always the numbers) except for the first sentence so that it looks like this:

Tina wants to sell ■ items for the fundraiser. ■

Ask students: What do you notice? What do you wonder? And record it in a Notice/Wonder T-chart. Students might wonder: What items is Tina selling? What is the fundraiser for? Questions like these are okay because it means students are painting a picture in their brains of what is happening—tell students that! Say things like, “Wow, I can tell you have sold things before and you are maybe picturing Tina selling the same things that you did!” Students might also ask questions about vocabulary here like, “I wonder what ‘fundraiser’ means?”

Next, give the students a little bit more of the problem such as this:

Tina wants to sell ■ items for the fundraiser. She knows that she has ■ days left to sell. ■

Again, ask students to Notice and Wonder using the T-chart to add their new thoughts and continue the process from above. The last thing revealed in a Numberless Word problem are the numbers and that’s when students get to work on creating the equation. This process trains their brain to look at numbers last and notice and wonder about the meaning of the story first.

4. Write an equation to represent the unknown quantity. Bella brought stickers to school to give to 12 of her friends. Each friend received 4 stickers. How many stickers did Bella bring to school? Let “s” represent the number of stickers Bella brought to school.

A student may confuse 12 as the amount of stickers because they saw “give to” as a keyword rather than Bella giving the unknown amount of stickers to 12 of her friends. Some students may need to use a box or a line for the unknown number first and then replace it with a variable. Encourage them to think about what is taking place within the statement. The use of manipulatives to set the problem up would be a great tool so that the student can act out what is occurring within the problem. A graphic organizer would also be beneficial.

Students should engage in rich, collaborative conversations where they create expressions and equations to match the story problem and defend their reasoning with a model (equation mat, balance scale, number line). Invite the class to critique each other’s models and equations: Does it make sense? How do you know? Can you write a similar equation that would NOT make sense? Do you have any questions for the team? How does the team’s equation match the model?

5. Tony has twice as many baseball cards in his collection as his friend Antwon. Antwon has 32 baseball cards. Write a number sentence that could be used to find x, the number of baseball cards that Tony has?

A student may have difficulty determining the operation for this problem because they do not understand the concept of “twice as many” and that it refers to multiplying by 2. This means that the student is lacking understanding of the operation rather than solely writing the equation. A student may also confuse the x used in multiplication with the variable “x.” Encourage the student to think about what is taking place within the statement. Some students may benefit from the use of manipulatives to set the problem up or using a graphic organizer.

Language such as “twice,” “double,” “3 times as many,” “half of,” etc. can be emphasized during purposefully planned Number Talks and numeracy routine. An example of a string that could pull in this vocabulary is:

- 7×4
- 14×2
- 28×1

As students engage in the strings one at a time, have them consider how they connect. What is the relationship between 14×2 and 7×4 ? What do you notice about the products? If a student says “divide by two,” name it “halving” or “half.” If a student says “times it by two,” name it “doubling,” or “twice as many.” These types of Number Talks are also imperative in building relational thinking as students continue to utilize efficient strategies for computation.