



Topic G:

Solving Equations

6.EE.B.5, 6.EE.B.6, 6.EE.B.7

Focus Standard:	6.EE.B.5	Understand solving an equation or inequality as a process of answering a question; which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
	6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
	6.EE.B.7	Solve real-world and mathematical problems by writing and solving equations in the form $x + p = q$ and $px = q$ for cases in which p , q , and x are all nonnegative rational numbers.
Instructional Days:	7	
Lessons 23–24:	True and False Number Sentences (P, P) ¹	
Lesson 25:	Finding Solutions to Make Equations True (P)	
Lesson 26:	One-Step Equations—Addition and Subtraction (M)	
Lesson 27:	One-Step Equations—Multiplication and Division (E)	
Lesson 28:	Two-Step Problems—All Operations (M)	
Lesson 29:	Multi-Step Problems—All Operations (P)	

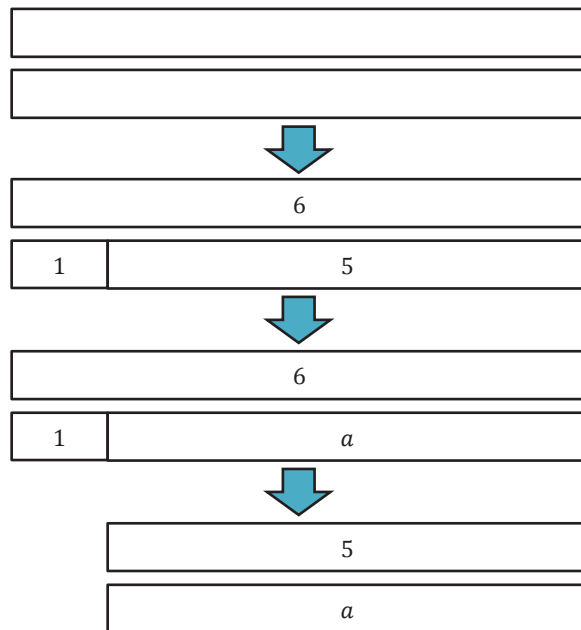
In Topic G, students move from identifying true and false number sentences to making true number sentences false and false number sentences true. In Lesson 23, students explain what equality and inequality symbols represent. They determine if a number sentence is true or false based on the equality or inequality symbol.

¹ Lesson Structure Key: **P**-Problem Set Lesson, **M**-Modeling Cycle Lesson, **E**-Exploration Lesson, **S**-Socratic Lesson

Symbol	Meaning	Example
=	Is equal to	$1.8 + 3 = 4.8$
$\neq$	Is not equal to	$6 \div \frac{1}{2} \neq 3$
>	Is greater than	$1 > 0.9$
<	Is less than	$\frac{1}{4} < \frac{1}{2}$

In Lesson 24, students move to identifying a value or a set of values that makes number sentences true. They identify values that make a true sentence false. For example, students substitute 4 for the variable in $x + 12 = 14$ to determine if the sentence is true or false. They note that when 4 is substituted for x , the sum of $x + 12$ is 16, which makes the sentence false because $16 \neq 14$. They change course in the lesson to find what they can do to make the sentence true. They ask themselves, “What number must we add to 12 to find the sum of 14?” By substituting 2 for x , the sentence becomes true because $x + 12 = 14$, $2 + 12 = 14$, and $14 = 14$. They bridge this discovery to Lesson 25 where students understand that the solution of an equation is the value or values of the variable that makes the equation true.

Students begin solving equations in Lesson 26. They use bar models or tape diagrams to depict an equation and apply previously learned properties of equality for addition and subtraction to solve the equation. Students check to determine if their solutions make the equation true. Given the equation $1 + a = 6$, students represent the equation with the following model:



Students recognize that the solution can also be found using properties of operations. They make connections to the model and determine that $1 + a - 1 = 6 - 1$ and, ultimately, that $a = 5$. Students represent two step and multi-step equations involving all operations with bar models or tape diagrams while continuing to apply properties of operations and the order of operations to solve equations in the remaining lessons in this topic.