Topic F:

Writing and Evaluating Expressions and Formulas

6.EE.A.2a, 6.EE.A.2c, 6.EE.B.6

Focus Standards:	6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers
		a. Write expressions that record operations with numbers with letters standing for numbers. *For example, express the calculation "Subtract y from* 5*" as* $5 - y$.
		c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6s^2$ *to find the volume and surface area of a cube with sides of length* $s = \frac{1}{2}$.
	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 specific set
Instructional Days:	5	
Lesson 18:	Writing and Evaluating Expressions—Addition and Subtraction (P)[1]	
Lesson 19:	Substituting to Evaluate Addition and Subtraction Expressions (P)	
Lesson 20:	Writing and Evaluating Expressions—Multiplication and Division (P)	
Lesson 21:	Writing and Evaluating Expressions—Multiplication and Addition (M)	
Lesson 22:	Writing and Evaluating Expressions—Exponents (P)	

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

In Topic F, students demonstrate their knowledge of expressions from previous topics in order to write and evaluate expressions and formulas. Students bridge their understanding of reading and writing expressions to substituting values in order to evaluate expressions. In Lesson 18, students use variables to write expressions involving addition and subtraction from real-world problems. They evaluate those expressions when they are given the value of the variable. For example, given the problem "Quentin has two more dollars than his sister, Juanita," students determine the variable to represent the unknown. In this case, students let $x =$ Juanita's money, in dollars. Since Quentin has two more dollars than Juanita, students represent his quantity as $x + 2$. Now, students can substitute given values for the variable to determine the amount of money Quentin and Juanita each have. If Juanita has fourteen dollars, students substitute the x with the amount, 14, and evaluate the expression: $x + 2$.

$$14 + 2$$
$$16$$

Here, students determine that the amount of money Quentin has is 16 dollars because 16 is two more than the 14 dollars Juanita has.
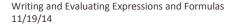
In Lesson 19, students develop expressions involving addition and subtraction from real-world problems. They use tables to organize the information provided and evaluate expressions for given values. They continue to Lesson 20 where they develop expressions again, this time focusing on multiplication and division from real-world problems. Students bridge their study of the relationships between operations from Topic A to further develop and evaluate expressions in Lesson 21, focusing on multiplication and addition in real-world contexts.

Building from their previous experiences in this topic, students create formulas in Lesson 22 by setting expressions equal to another variable. Students assume, for example, that there are p peanuts in a bag. There are three bags and four extra peanuts all together. Students express the total number of peanuts in terms of p: $3p + 4$. Students let t be the total number of peanuts and determine a formula that expresses the relationship between the number of peanuts in a bag and the total number of peanuts, $t = 3p + 4$. From there, students are provided a value for p, which they substitute into the formula: If $p = 10$, they determine that there are $3(10) + 4 = 30 + 4 = 34$ peanuts.

In the final lesson of the topic, students evaluate formulas involving exponents for given values in real-world problems.