

## Just in Time Quick Check

### Standard of Learning 8.PFA.1

#### **Strand:** Patterns, Functions, and Algebra

#### **Standard of Learning 8.PFA.1**

**The student will represent, simplify, and generate equivalent algebraic expressions in one variable.**

*Students will demonstrate the following Knowledge and Skills:*

- a) Represent algebraic expressions using concrete manipulatives or pictorial representations (e.g., colored chips, algebra tiles), including expressions that apply the distributive property.
- b) Simplify and generate equivalent algebraic expressions in one variable by applying the order of operations and properties of real numbers. Expressions may need to be expanded (using the distributive property) or require combining like terms to simplify. Expressions will include only linear and numeric terms. Coefficients and numeric terms may be rational.

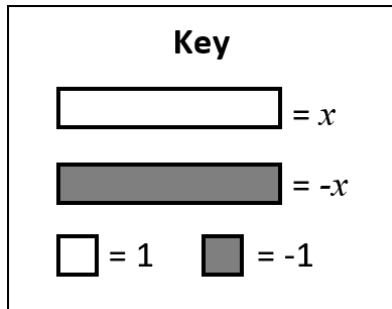
#### Just in Time Quick Check

#### Just in Time Quick Check Teacher Notes

**Supporting and Prerequisite SOL:** 7.PFA.2

### Just in Time Quick Check 8.PFA.1

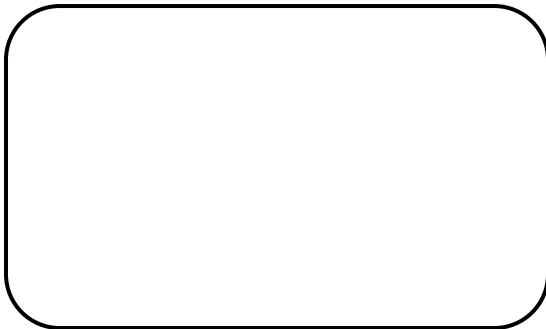
For questions 1 and 2, use the key provided.



1. Sketch a model for the expression  $3(x - 2)$  in the expression mat.



2. Sketch a model for the expression  $-2x + 5$  in the expression mat.



3. Simplify the algebraic expression  $5(2x - 3) + 7$ .

4. Simplify the algebraic expression  $0.3(x + 4) - 0.7x - 2$ .

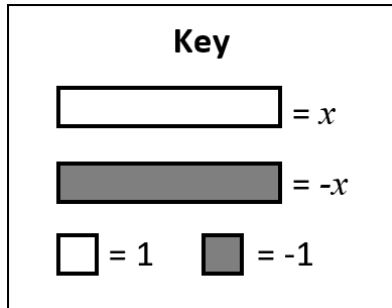
5. Simplify the algebraic expression  $\frac{3}{4}b - \frac{1}{2}(b + 8)$ .

6. Rewrite the expression  $(x + 5) - (2 - x)$  as an equivalent expression in its most simplified form.

## 8.PFA.1 Just in Time Quick Check Teacher Notes

### Common Errors/Misconceptions and their Possible Indications

For questions 1 and 2, use the key provided.



1. Sketch a model for the expression  $3(x - 2)$  in the expression mat.



*A common error students may make is modeling  $3x - 2$  instead of recognizing that  $x - 2$  should be repeated 3 times. Students making this error would benefit from practice modeling expressions with the distributive property in multiple ways. Students could distribute the 3 and model  $3x - 6$  and model repeating  $x - 2$  three times and discuss similarities and differences between the process and the resulting models.*

2. Sketch a model for the expression  $-2x + 5$  in the expression mat.



*A common error students may make is modeling  $-2 + x + 5$ . Students making this error may not understand how the coefficient should be represented in the model. Students may benefit from additional practice modeling single terms consisting of a coefficient and variable, then transitioning to expressions with multiple terms.*

3. Simplify the algebraic expression  $5(2x - 3) + 7$ .

*A common error is for students to multiply 5 by the first term,  $2x$ , but neglect to multiply the second term,  $-3$ , by 5. Students who make this error will obtain a simplified expression that is not equivalent to the original:  $10x + 4$ . This indicates that students may not have a conceptual understanding of the distributive property. Modeling the original expression with a manipulative like algebra tiles may help reinforce the fact that the quantity  $2x - 3$  needs to be laid out using a set of tiles five times creating the equivalent expression  $10x - 15 + 7$  which, in turn, simplifies to  $10x - 8$ .*

4. Simplify the algebraic expression  $0.3(x + 4) - 0.7x - 2$ .

*A common error students may make is to combine like terms incorrectly to get  $1x$  or  $x$ . This may indicate that students do not recognize the  $0.7x$  as a negative quantity. After distributing, it may be helpful for students to rewrite the expression as addition and apply the commutative property to reorder the expression so that like terms are next to one another. Color-coding positive and negative values could also help make a connection to the modeling of integer operations.*

5. Simplify the algebraic expression  $\frac{3}{4}b - \frac{1}{2}(b + 8)$ .

*One common student error occurs when  $-\frac{3}{4}b$  and  $\frac{1}{2}b$  are not combined to create  $-\frac{1}{4}b$ . This may indicate that students do not have a conceptual understanding of combining like terms. Students would benefit from experience combining like terms with rational coefficients, so that they will recognize that like terms are terms that have the same variables and exponents, but they do not need to have the same coefficients.*

6. Rewrite the expression  $(x + 5) - (2 - x)$  as an equivalent expression in its most simplified form.

*A common error students may make is to only distribute the  $-1$  to the first term,  $2$ , and neglect to distribute the  $-1$  to the  $-x$ , resulting in an incorrect answer of  $3$ . This may indicate students do not understand that  $-1$  needs to be distributed to both terms in the quantity  $2 - x$ . Students need to recognize that the factor being distributed to the quantity  $2 - x$  is negative  $1$  or that subtracting is the same as adding the opposite, so the expression could be rewritten as  $(x + 5) - 1(2 - x)$ .*