

Core Content

Cluster Title: Use properties of operations to generate equivalent expressions.
Standard 1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
Concepts and Skills to Master
<ul style="list-style-type: none"> Use the Distributive Property to expand and factor linear expressions with rational numbers. Combine like terms with rational coefficients.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> Commutative Property, Associative Property, Distributive Property Order of Operations Generate equivalent expressions (e.g. simplify) involving whole numbers.(6.EE.3) 	
Academic Vocabulary	
Terms, coefficient, like-terms, distribute, expression, rational, linear, expand, factor, equivalent, simplify	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Model equivalent expressions such as $4x + 14 = 2(2x) + 2(7) = 2(2x + 7)$ and have students explain why all three are equivalent. Use manipulatives such as Algebra Tiles or candy to model equivalent expressions. 	<ul style="list-style-type: none"> Algebra Tiles Algebra Blocks Algebra Lab Gear
Sample Formative Assessment Tasks	
Skill-based Task	Problem Task
<p>Simplify the following linear expression.</p> $\frac{1}{2}x + \left(\frac{2}{5}x - 7\right)$ <p>Factor $-3x + 9$</p>	<p>Which students correctly simplified the expressions? Justify your reasoning. Fix all incorrectly simplified expressions.</p> <p>Brianda: $\frac{dc}{ca} = \frac{d}{a}$ Sara: $\frac{n+x}{n+m} = \frac{x}{m}$ Jorge: $\frac{-5xyz}{7xy} = \frac{5z}{-7}$</p> <p>Julia: $\frac{3s+7t}{4s} = \frac{3+7t}{4}$ Trent: $\frac{x+xy}{xz} = \frac{1+y}{z}$</p>

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Standard 2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”</i>
Concepts and Skills to Master
<ul style="list-style-type: none"> Recognize and explain the meaning of a given expression and its component parts. Recognize that different forms of an expression may reveal different attributes of the context.

Supports for Teachers

Critical Background Knowledge	
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Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Use multiple student-generated equivalent representations of the same problem to explore how the structure of an expression reveals different attributes of the context. 	“Uncovering Student Thinking in Mathematics Grades 6-12” Rose and Arline
Sample Formative Assessment Tasks	
Skill-based Task	Problem Task
<p>Are the following equivalent? Why or why not?</p> <p>1) $\frac{1}{2}bh = \frac{bh}{2}$ 2) $x - (-3) = x + 3$ 3) $7y\frac{\sqrt{3}}{\sqrt{3}} = 7y$</p>	<p>Write three equivalent expressions for:</p> <p>$\frac{2}{3}(6x + 9) + 6x$ Justify the equivalence of your expressions.</p>