Use properties of operations to generate equivalent expressions (7.EE.1-2)	
Standard 7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	
Concepts and Skills to Master	
• Generate equivalent expressions by applying properties of operations (associative, commutative, distributive, etc) as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. • Combine like terms with rational coefficients.	
Related Standards: Current Course	Related Standards: Future Courses
7.RP.3, 7.NS.1, 7.NS.2, 7.NS.3, 7.EE.1, 7.EE.2, 7.EE.3, 7.EE. 4, 7.G.6	8.EE.7, 8.G.7, 8.G.8

Support for Teachers

Critical Background Knowledge
• Apply properties of operations to generate equivalent expressions (6.EE.3) • Identify when expressions are equivalent (6.EE.4) • Apply properties of operations as strategies to multiply and divide (3.OA.5) • Operations with positive rational numbers (5.NF.1-7 and 6.NS.1-7)
Academic Vocabulary
Terms, coefficient, like-terms, distribute, expression, rational, equivalent, simplify, expand, factor
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5170#71314

Use properties of operations to generate equivalent expressions (7.EE.1-2)	
Standard 7.EE.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. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	
Concepts and Skills to Master	
• Recognize that different forms of an expression can highlight different aspects of the problem. • Recognize and explain the meaning of a given expression and its component parts in terms of a context.	
Related Standards: Current Course	Related Standards: Future Courses
7.RP.3, 7.EE.1, 7.EE.2, 7.EE.3, 7.EE. 4, 7.G.6	8.EE.7, 8.SP.3, I.A.CED.4, I.A.SSE.1, II.A.SSE.2, II.A.SSE.3, III.A.SSE.2, III.A.SSE.1

Support for Teachers

Critical Background Knowledge
• Apply properties of operations to generate equivalent expressions (6.EE.3) • Identify when expressions are equivalent (6.EE.4)
Academic Vocabulary
Terms, coefficient, like-terms, distribute, expression, rational, equivalent, simplify, expand, factor
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5170#71314

Solve real-life and mathematical problems using numerical and algebraic expressions and equations (7.EE.3-4)	
Standard 7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	
Concepts and Skills to Master	
• Solve multi-step real-life and mathematical problems involving calculations with rational numbers in any form. • Utilize various forms of rational numbers to solve and make sense of problems. • Choose between forms of a rational number to simplify calculations or communicate solutions meaningfully. • Assess the reasonableness of answers using mental computation and estimation.	
Related Standards: Current Course	Related Standards: Future Courses
7.NS.2d, 7.NS.3	8.EE.3, 8.EE.4

Support for Teachers

Critical Background Knowledge
• Solve real world problems assessing reasonableness of answers using mental computation (3.OA.8, 4.OA.3, 5.NF.2, and 5.NF.6) • Solve real world and mathematical problems involving the four operations with rational numbers (7.NS.3) • Convert between common fractions, decimals, and percent: Use decimal notation for fractions with denominators of 10 or 100 (4.NF.6); convert a rational number to a decimal (7.NS.2d); find a percent of a quantity (6.RP.3c)
Academic Vocabulary
• Estimate, rational number, reasonableness, solution
Resources:
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5170#71314

Solve real-life and mathematical problems using numerical and algebraic expressions and equations (7.EE.3-4)
Standard 7.EE.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **a.** Solve word problems leading to equations of the form $px+q=r$ and $p(x+q)=r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* **b.** Solve word problems leading to inequalities of the form $px+q>r$ or $px+q<r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*
Concepts and Skills to Master
•Use variables to create and solve equations ($px+q=r$ and $p(x+q)=r$) that model word problems. • Connect arithmetic solution processes that do not use variables to algebraic solution processes that use equations. •Use variables to create and solve inequalities ($px+q>r$ or $px+q<r$) that model word problems. • Graph and interpret the solution set of an inequality (compare the solution of an equation to that of an inequality). • Distinguish between equations and inequalities.

Related Standards: Current Course	Related Standards: Future Courses
7.RP.2, 7.RP.3, 7.NS.3, 7.EE.3, 7.G.6	8.EE.7, 8.F.4, 8.G.6, All algebra and many function standards (algebra and function is used throughout high school mathematics courses)

Support for Teachers

Critical Background Knowledge
• Use variables to represent numbers when solving a real world problem (6.EE.6) • Solve one-step linear equations (x+p = q) involving non-negative rational numbers (6.EE.7) • Use inequality symbols (1.NBT.3 and throughout elementary) and represent solutions of inequalities such as x < c or x > c on a number line (6.EE.8) • Solve real world math problems with the four operations using rational numbers (7.NS.3)
Academic Vocabulary
Algebraic, inequality, equation, inverse operations, solution set, at most, at least
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5170#71314