Lesson Progression Overview:

Lesson Big Idea	Lesson Details	Content Standards	Standards for Mathematical Practice
Lesson 1: Numbers and Estimation	Students will be introduced to the course using an estimation activity that will be used to develop conception of numbers and reinforce numeral operation fluency. It is also an entry activity into the course showcasing the explicit incorporation of math practices including problem solving, reasoning and modeling using mathematics.	7.NS.1 7.NS.2 7.NS.3 N-Q.1	MP 2 MP 3 MP 4
Lesson 2: Interpreting Expressions	Students will begin this lesson by engaging in a "magic math" activity. This lesson will give students opportunities to explore and determine their understanding of expressions. They will be asked to consider, create and understand verbal representations of numbers and operations to symbolic representations using expressions. They will examine how symbolic manipulation of expressions affects values in real circumstances.	7.NS.3 A-SSE.1	MP 2 MP 6 MP 7 MP 8
Lesson 3: Reading and Evaluating	This lesson will give students an opportunity to fortify their understanding of interpreting and modifying expressions by analyzing symbolic manipulation of various expressions.	7.EE.2 A-SSE.1 A-SSE.2	MP 6 MP 7
Lesson 4: Constructing Equivalent Expressions	Students will begin this lesson by engaging in a real-life problem that encompasses some basic geometric concepts along with expression manipulation. This lesson will give students an– opportunity to fortify their understanding of writing expressions.	A-SSE.1 A-SSE.2 A-SSE.3	MP 2 MP 3 MP 4 MP 7
Lesson 5: Constructing Equivalent Expressions	Students will begin this lesson by engaging in a task on developing expressions for a particular geometric pattern. This lesson will strengthen the ability of students to compare expressions presented in different forms and determine equivalency.	A-SSE.3 F-IF.8	MP 1 MP 3 MP 7 MP 8
Lesson 6: Distributive Law	Students will begin this lesson with an engaging activity that will lead to an understanding of rewriting and interpreting expressions using the distributive property.	A-SSE.1 A-SSE.2	MP 3 MP 4
Lesson 7: Formative Assessment Lesson	This lesson is intended to help teachers assess how well students are able to translate between words, symbols, tables, and area representations of algebraic expressions. It is designed to identify and support students who have difficulty in these concepts. (Shell Center Formative Assessment Lesson: Interpreting Algebraic Expressions)	A-SSE.1 A-SSE.2	MP 2 MP 7

Common Core State Standards:

Quantities

Reason quantitatively and use units to solve problems.

- N-Q.1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

Seeing Structure in Expressions

Interpret the structure of expressions.

- A.SSE.1: Interpret expressions that represent a quantity in terms of its context.
- A.SSE.2: Use the structure of an expression to identify ways to rewrite it.

Write expressions in equivalent forms to solve problems.

- A.SSE.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Interpreting Functions

Analyze functions using different representations.

- F-IF.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

Prior Scaffolding Knowledge / Skills:

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

- 6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
- 6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.
- 6.EE.3: Apply the properties of operations to generate equivalent expressions.
- 6.EE.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

Use properties of operations to generate equivalent expressions.

- 7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 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.

The Number System

Apply and extend previous understandings of operations with fractions.

- 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
- 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
- 7.NS.3: Solve real-world and mathematical problems involving the four operations with rational numbers.

Lesson Progression Overview:

Lesson Big Idea	Lesson Details	Content Standards	Standards for Mathematical Practice
Lesson 1: Constructing Expressions and Equations	Students will work from contextualized to decontextualized situations as well as vice versa. Students will be asked to construct and solve equations from verbal description. They will be given equations and asked to construct an accompanying verbal description with a solution.	8.EE.7 A-SSE.1a, b A-CED.1 A-REI.1	MP 2 MP 3 MP 7
Lesson 2: Equivalent expressions and equations	Students will study the structure of equations to determine if solutions exist. Additionally, students will examine expressions and equations to find pairs that are equivalent.	A-SSE.3 A-REI.1 A-REI.2	MP 1 MP 3 MP 7
Lesson 3: Formative Assessment Lesson	Students will complete the Formative Assessment Lesson Sorting Equations and Identities. This lesson will assess students' understanding of equations and identities and will provoke discussion on common misconceptions in algebra.	A-SSE.3 A-REI.1 A-REI.2	MP 3 MP 7
Lesson 4: Restructuring Equations	In this lesson, students will work to rearrange equations in order to solve for a desired variable.	A-CED.1 A-CED.4 A-REI.1 A-REI.2 A-REI.3	MP 2 MP 3 MP 7
Lesson 5: Inequalities	Students will explore the connection between equality and inequality. The behavior of inequalities in the negative number system is explored as well.	A-SSE.3 A-CED.1 A-CED.2 A-REI.1 A-REI.2 A-REI.3	MP 1 MP 2 MP 7

Common Core State Standards:

Expressions and Equations

Analyze and solve linear equations and pairs of simultaneous linear equations.

- 8.EE.7: Solve linear equations in one variable.

Seeing Structure in Equations

Interpret the structure of expressions.

- A-SSE.1: Interpret expressions that represent a quantity in terms of its context.
  a. Interpret parts of an expression, such as terms, factors and coefficients.

Write expressions in equivalent forms to solve problems.

- A-SSE.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Creating Equations

Create equations that describe numbers or relationships.

- A-CED.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED.3: Represent constraints by equations or inequalities and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- A-CED.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Reasoning with Equations and Inequalities

Understand solving equations as a process of reasoning and explain the reasoning.

- A-REI.1: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.
- A-REI.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Solve equations and inequalities in one variable.

- A-REI.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Prior Scaffolding Knowledge / Skills:

The Number System

Apply and extend previous understandings of numbers to the system of rational numbers.

- 6.NS.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

- 6.EE.2.a-c: Write, read, and evaluate expressions in which letters stand for numbers.
- 6.EE.3: Apply the properties of operations to generate equivalent expressions.
- 6.EE.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

Reason about and solve one-variable equations and inequalities.

- 6.EE.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?
- 6.EE.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.7: Solve real-world and mathematical problems by writing and solving equations of the form x+p=q and px=q.
- 6.EE.8: Write an inequality of the form x<c or x>c to represent a constraint or condition in a real-world or mathematical problem.

Represent and analyze quantitative relationships between dependent and independent variables.

- 6.EE.9: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Use properties of operations to generate equivalent expressions.

- 7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 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.

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- 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.
- 7.EE.4a-b: 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.