DECIMAL OPS: Computing with Decimals and Percents

Instructional Time and Investigations	23 days	• Inv. 1: Decimal Operations and Estimation (3 Problems) • Inv. 2: Adding and Subtracting Decimals (3 Problems) • Inv. 3: Multiplying and Dividing Decimals (5 Problems) • Inv. 4: Using Percents (4 Problems)
Goals	**Numeric Estimation:** Understand that estimation can be used as a tool in a variety of situations to solve problems. • Estimation is an important part of reasoning quantitatively. It helps you make sense of a situation, allows you to recognize errors, and complements other problem solving skills.	**Decimal Operations:** Continue to develop meanings for the four arithmetic operations on rational numbers. • The standard algorithm for dividing decimals is supported by the connections between fraction and decimal operations. • Fluency with decimal operations allows you to solve a variety of problems involving ratios and percents. • Understanding why an algorithm works helps you recognize when the algorithm is appropriate to use to solve a problem.
	Variables and Number Sentences: Use variables to represent unknown values and number sentences to represent relationships between values. • Writing number sentences to represent relationships between both real-world and abstract values contributes to an initial understanding of algebra. • Fact families can be used to write and solve equivalent number sentences.	**Percents:** Develop understanding of percents through various contexts. • Using models for percent helps you to develop the meaning of percent and to solve problems involving sales tax, tips, discounts, and percent increases.
Common Core Standards	**Common Core Standards for Mathematical Practice** **MP.1:** Make sense of problems and persevere in solving them. **MP.2:** Reason abstractly and quantitatively. **MP.3:** Construct viable arguments and critique the reasoning of others. **MP.4:** Model with mathematics. **MP.5:** Use appropriate tools strategically. **MP.6:** Attend to precision. **MP.7:** Look for and make use of structure. **MP.8:** Look for and express regularity in repeated reasoning.	**Common Core Content Standards** **6.NS.B.3:** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.EE.A.3:** Apply the properties of operations to generate equivalent expressions. **Also 6.RP.A.1, 6.RP.A.2, 6.RP.A.3, 6.RP.A.3b-c, 6.NS.A.1, 6.NS.B.2, 6.EE.A.2, 6.EE.A.2a, 6.EE.B.5, 6.EE.B.6, 6.EE.B.7**

	DECIMAL OPS: Computing with Decimals and Percents	
	Content Connections to Other Units	
Goals of the Unit	**Prior Work**	**Future Work**
Numeric Estimation: Understand that estimation can be used as a tool in a variety of situations to solve problems.	• Connecting fractions, decimals, and percents to check the reasonableness of answers, estimating to check reasonableness of answers (*Comparing Bits and Pieces*)	• Connecting fractions, decimals, and percents to check the reasonableness of answers, estimating to check reasonableness of answers (*Stretching and Shrinking; Comparing and Scaling; Growing, Growing, Growing*)
Decimal Operations: Continue to develop meanings for the four arithmetic operations on rational numbers.	• Developing and applying algorithms for performing decimal calculations (*Let's Be Rational*) • Developing algorithms for finding the area and perimeter of two-dimensional shapes (*Covering and Surrounding*) • Interpreting decimals as fractions; understanding place value of decimals; combining and comparing decimals (*Comparing Bits and Pieces*) • Performing mathematical operations with fractions (*Let's Be Rational*) • Inverse operations in whole number settings (*Elementary School*) and in fraction settings (*Let's Be Rational*) • Finding an unknown dimension when given area (*Covering and Surrounding*)	• Interpreting decimals as probabilities (*What Do You Expect?; Samples and Populations*) and as scale factors, ratios, and proportions (*Stretching and Shrinking*) • Using decimals in scientific notation (*Growing, Growing, Growing*) • Interpreting decimals as constants and variable coefficients in linear and nonlinear equations and relationships (*Variables and Patterns; Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing; Frogs, Fleas, and Painted Cubes; Say It With Symbols; It's In the System*) • Using decimals to understand integers and real numbers (*Accentuate the Negative; Looking for Pythagoras*) • Developing algorithms for finding the volume and surface area of three-dimensional shapes (*Filling and Wrapping*) • Developing algorithms for integer computation (*Accentuate the Negative*) • Applying decimals in studying probability (*What Do You Expect?; Samples and Populations*) • Applying ratios, proportions, and scale factors (*Stretching and Shrinking; Comparing and Scaling; Moving Straight Ahead; Thinking With Mathematical Models*) • Inverse operations in integer settings (*Accentuate the Negative*) • Solving algebraic equations (*Variables and Patterns; Moving Straight Ahead; Thinking With Mathematical Models; Say It With Symbols; It's In the System; Function Junction*) • Recognizing patterns of change (*Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing; Frogs, Fleas, and Painted Cubes; It's In the System; Function Junction*)
Variables and Number Sentences: Use variables to represent unknown values and number sentences to represent relationships between values.	• Inverse operations in whole number settings (*Elementary School*) and in fraction settings (*Let's Be Rational*) • Finding an unknown dimension when given area (*Covering and Surrounding*)	• Inverse operations in integer settings (*Accentuate the Negative; Filling and Wrapping*) • Writing and solving algebraic equations (*Variables and Patterns; Moving Straight Ahead; Thinking With Mathematical Models; Say It With Symbols; It's In The System*) • Recognizing patterns of change (*Moving Straight Ahead; Thinking With Mathematical Models; Growing, Growing, Growing; Frogs, Fleas, and Painted Cubes; Function Junction*)
Percents: Develop understanding of percents through various contexts.	• Connecting fractions, decimals, and percents to check the reasonableness of answers, estimating to check reasonableness of answers (*Comparing Bits and Pieces*) • Developing and applying algorithms for performing fraction calculations (*Let's Be Rational*) • Defining, comparing, and applying percents (*Comparing Bits and Pieces*)	• Interpreting percents as probabilities (*What Do You Expect?; Samples and Populations*) • Applying percents to analyze data (*Data About Us; Samples and Populations*) • Understanding percents in exponential growth and decay (*Growing, Growing, Growing*)