Unit 4 - *Multiplying and Dividing Whole Numbers and Decimals*

Overview

In this unit, students return to the study of multiplication and division strategies, including the standard multiplication algorithm. In the first two modules, students investigate a number of strategies that capitalize on their estimation and mental math skills and help them to continue to develop strong number sense. These include strategies that leverage the relationships between multiplication and division; the fact that 5 is half of 10; the relationships between fractions, decimals, and whole numbers and the process of doubling and halving. In Module 3 the teacher formally introduces the standard multiplication algorithm after reviewing the area model and partial products. Module 4 reinforces the connection between multiplication and division, using the area model and ratio tables to help students develop a degree of comfort with long division.

21st Century Capacities: Analyzing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 1 Make sense of problems and persevere in solving them
MP4 Model with Mathematics
MP5 Use appropriate tools strategically
MP6 Attend to precision

Write and interpret numerical expressions.
CCSS.MATH.CONTENT.5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

CCSS.MATH.CONTENT.5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Transfer:

Students will be able to independently use their learning in new situations to...

1. Demonstrate fluency with math facts, computation and concepts.
2. Use appropriate tools to make reaching solutions more efficient, accessible and accurate.
3. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (analyzing)

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Mathematicians flexibly use different tools, strategies, and operations to build conceptual knowledge or solve problems.
2. Mathematicians apply the mathematics they know to solve problems occurring in everyday life.
3. Mathematicians use number sense to compute fluently and make reasonable estimates.

ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*

A. What is another way that this problem could be solved?
B. How do I decide if my answer makes sense, and if not, what do I do?
C. How do operations relate to one another?
D. Have I used what I understand about numbers to make this easier?
E. In what ways can numbers be composed and decomposed?

	Acquisition:	
Perform operations with multi-digit whole numbers and with decimals to hundredths. CCSS.MATH.CONTENT.5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm. CCSS.MATH.CONTENT.5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. CCSS.MATH.CONTENT.5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. CCSS.MATH.CONTENT.5.NF.B.4.A Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. Convert like measurement units within a given measurement system. CCSS.MATH.CONTENT.5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	*Students will know…* 1. How to use ratio tables to create solutions for multiplying and dividing by powers of ten. 2. How to solve multi-digit multiplication problems using standard algorithm, area model, and partial products. 3. How to multiply and divide using mental math strategies. 4. How to divide using the partial quotient method. 5. Vocabulary: partial products, partial quotients, product, standard algorithm, equation, ratio table, estimation, factor, divisor, dividend, quotient, remainder, array, double/half, expression,	*Students will be skilled at…* 1. Multiplying/dividing using mental math strategies 2. Multiplying using partial products and standard algorithm 3. Dividing using partial quotients 4. Identifying division vocabulary 5. Using ratio tables to solve multiplication and division 6. Calculating fraction of a whole