

Unit 6 - A Fraction of This, A Multiple of That

Overview

The instruction in Unit 6 picks up where Unit 2 left off, further developing the skills and concepts associated with multi-digit multiplication and division. Students discover that the models they have been using and strategies they have developed for multi-digit multiplication work equally well for division. They learn to divide numbers into the thousands by 1-digit numbers, using strategies based on the relationship between multiplication and division, as well as on place value, and the properties of operations. Students also explore the relationship between division and fractions and decimals.

21st Century Capacities: Decision Making, Collective Intelligence

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 3 Construct viable arguments and critique the reasoning of others
 MP4 Model with Mathematics
 MP7 Look for and make use of structure

CCSS.MATH.CONTENT.4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
 CCSS.MATH.CONTENT.4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Transfer:

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

1. Evaluate the accuracy and efficiency of a given solution.
2. Draw conclusions about graphs, shapes, equations, or objects. (Decision Making)
3. Model relationships among quantities.
4. Work cooperatively to employ learning strategies effectively (Collective Intelligence)

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Mathematicians create or use models to examine, describe, solve and/or make predictions.
2. Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions.
3. Mathematicians work respectfully and

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

- A. How can I use models and strategies to show my thinking?
- B. How can understanding area help me multiply and divide?
- C. How do I work respectfully and responsibly with my classmates to solve a math problem?

Grade 4 Math Curriculum

<p>CCSS.MATH.CONTENT.4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p> <p>CCSS.MATH.CONTENT.4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-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.</p> <p>CCSS.MATH.CONTENT.4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p> <p>CCSS.MATH.CONTENT.4.NF.B.3.C Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</p> <p>CCSS.MATH.CONTENT.4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.</p> <p>CCSS.MATH.CONTENT.4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit ($1/2$, $1/4$, $1/8$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.</p>	<p>responsibly with others to achieve a goal.</p> <p>4. Mathematicians create dependable arguments by calculating efficiently and accurately.</p>	<p>D. How do I decide if my answer makes sense, and if not, what do I do?</p>
Acquisition:		
	<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. That the strategies they have learned for multiplication also work for division. 2. That the dividend is the area and the divisor and quotient are the dimensions of an array or area model. 3. Strategies for multiplying and dividing including: doubling and halving strategies, 4. Partial quotients, over strategies. 5. Formulas for solving area and perimeter. 6. How to create a line plot 7. Vocabulary: dividend, divisor, quotient, partial product, partial quotient, line plot, mean, median, mode 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Using arrays and ratio tables to model and solve multi-digit multiplication and division problems 2. Using a variety of strategies to find a product/quotient 3. Using what they know about multiplication to solve division problems 4. Interpreting remainders 5. Recognizing and generating equivalent fractions 6. Write fractions with denominator 10 in decimal notation