

Unit 1 - Multiplicative Thinking

Overview

This unit focuses on developing concepts related to multiplication and division through models (open number line, tile arrays, area model and the ratio table), strategies for multiplication facts and multiplicative comparisons. Students continue to transition from additive to multiplicative thinking, a process begun in third grade, by studying multiplicative comparisons presented in story problems involving both multiplication and division. The first lessons set the tone for the year with community building and establish expectations for working cooperatively on learning tasks within the math workshop. Students set goals for their learning related to multiplication fact fluency which they will reflect upon throughout the year.

21st Century Capacities: Collective Intelligence, Reflection

Stage 1 - Desired Results

<p>ESTABLISHED GOALS/ STANDARDS</p> <p>MP 1 Make sense of problems and persevere in solving them.</p> <p>MP 3 Construct viable arguments and critique the reasoning of others.</p> <p>MP8 Look for and express regularity in repeated reasoning.</p> <p>CCSS.MATH.CONTENT.4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <p>CCSS.MATH.CONTENT.4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using</p>	<p>Transfer:</p> <p><i>Students will be able to independently use their learning in new situations to...</i></p> <ol style="list-style-type: none"> 1. Demonstrate fluency with math facts, computation and concepts (multiplication) 2. Work cooperatively to employ learning strategies effectively (Collective Intelligence) 3. Evaluate present progress toward learning in order to set achievable goals(reflection) 		
	<p>Meaning:</p> <table border="1" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Tracking their progress of fact strategies will help with goal setting and mastery of multiplication facts 2. Tools and visual models help us to problem solve and explain our thinking 3. Strategies help us to recognize relationships between numbers to develop fact fluency 4. Multiplication and division complement </td> <td style="vertical-align: top;"> <p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. How do multiplicative and additive comparisons differ? B. How can I use models and strategies help me to solve this problem? How do I know if it's right? C. What pattern(s) do I see in the numbers or how is this problem like another we have solved? </td> </tr> </table>	<p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Tracking their progress of fact strategies will help with goal setting and mastery of multiplication facts 2. Tools and visual models help us to problem solve and explain our thinking 3. Strategies help us to recognize relationships between numbers to develop fact fluency 4. Multiplication and division complement 	<p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. How do multiplicative and additive comparisons differ? B. How can I use models and strategies help me to solve this problem? How do I know if it's right? C. What pattern(s) do I see in the numbers or how is this problem like another we have solved?
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Grade 4 Math Curriculum

<p>drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.¹</p>	<p>each other</p> <p>5. We can work respectfully and responsibly with others to achieve a goal</p>	<p>D. What is the best way to show my thinking?</p> <p>E. How do I work respectfully and responsibly with my classmates to solve a math problem?</p> <p>F. How do I set goals for my learning in math?</p>
Acquisition:		
<p>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.</p> <p>CCSS.MATH.CONTENT.4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.</p>	<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. Strategies for multiplication fluently 2. Basic strategies for multiplication can be extended to multiplying larger numbers by single digit numbers 3. Partial products can help solve multiplication and division problems 4. The commutative, zero, and identity properties of multiplication 5. Problems can be approached from a range of perspectives 6. Vocabulary: product, factor, dividend, divisor, quotient, multiple, prime, composite, multiplicative comparison 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Finding factors and multiples of number to 100 2. Determining if a number is prime or composite 3. Using an open number line, ratio table and area model to solve a multiplication or division problem 4. Interpreting multiplication equations as statements of multiplicative comparisons 5. Translating comparative situations for multiplication and division into equations with unknown product, group size unknown, or number of groups unknown