

Grade 5 Fluently Multiply Multi-digit Numbers and Finding Whole Number Quotients Unit of Instruction

This is a progressive unit of instruction that only addresses standards **MAFS.5.NBT.2.5** and **MAFS.5.NBT.2.6** in Cluster 2 of Number and Operations in Base Ten. It begins with connecting the area model of multiplication your students mastered last year to the standard algorithm of multi digit multiplication. Then it progresses to division and using strategies to divide not the algorithm. Formative assessments are included to gauge mastery. Please access the links to the [4th grade 2 – digit Multiplication Unit of Instruction](#) and the [3rd grade Multiplication and Division Unit of Instruction](#) to use with students who need additional conceptual understanding.

Number and Operations in Base Ten

Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

Cluster 2: Perform operations with multi-digit whole numbers and with decimals to hundredths

Your students had extensive work with the concrete and representational aspect of this standard, MAFS.5.NBT.2.5. You are bringing them to the abstract. Be sure they see the connection between the area model and partial product to the algorithm. Bridge that gap from representational to abstract by showing them both side by side. Don't take away the representational until they see the connection. Some will see the connection sooner than others. Be patient and it will pay off in the end....and will help with the concept of division.

<p style="text-align: center;">Area Models to Algorithms</p>	<p style="text-align: right;">http://www.cpalms.org/Public/PreviewResource/Preview/73394</p> <p>Students will investigate the standard algorithm of two-digit by two-digit multiplication and how it connects and relates to the area model. This will provide an introduction to the standard algorithm.</p> <p><i>Students should use graph paper to draw their arrays and show the factor pairs. Concrete – Representational step.</i></p> <p>MAFS.5.NBT.2.5: Fluently multiply multi-digit whole numbers using the standard algorithm.</p>
<p style="text-align: center;">Area Model of Multiplication Using Base 10 Manipulatives (Double Digit Multiplication)</p>	<p style="text-align: right;">http://www.cpalms.org/Public/PreviewResource/Preview/8112</p> <p>Students will use base 10 manipulatives to build a rectangular array to represent double digit multiplication. Students will make the connection between the standard algorithm and the rectangular array</p> <p><i>Students should use graph paper to draw their arrays and show the factor pairs. Concrete – Representational step.</i></p> <p>MAFS.5.NBT.2.5: Fluently multiply multi-digit whole numbers using the standard algorithm.</p>

Formative Assessments for MAFS.5.NBT.2.5

<p>Complete the Multiplication Problem</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58070</p> <p>Students are asked to finish a multiplication problem that has already been started using the standard algorithm.</p>
<p>Find the Multiplication Error</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58067</p> <p>Students are asked to find the error in a multiplication problem involving a three-digit and a two-digit number.</p>
<p>Multiplying Using the Standard Algorithm</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58068</p> <p>Students are asked to complete two multiplication problems using the standard algorithm.</p>
<p>More Multiplication Using the Standard Algorithm</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58072</p> <p>Students are asked to complete two multiplication problems using the standard algorithm.</p>

<p style="text-align: center;">Easy as Pie Division!</p>	<p style="text-align: right;">http://www.cpalms.org/Public/PreviewResource/Preview/49754</p> <p>This is a hands-on lesson to show the relationship between division and multiplication. It provides a different method for solving long division that my students love.</p> <p>MAFS.5.NBT.2.6: 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.</p>
<p style="text-align: center;">Dividing for Equal Groups</p>	<p style="text-align: right;">http://www.cpalms.org/Public/PreviewResource/Preview/73315</p> <p>Given situational stories, students will use base 10 blocks to model division in order to solve problems. Stories will include a variety of problems including 2 digit dividends by 1 digit divisors, 3 and 4 digit dividends by 1 digit divisors, and 3 and 4 digit dividends by 2 digit divisors.</p> <p>MAFS.5.NBT.2.6: 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.</p>
<p style="text-align: center;">Diving Deeper into Division</p>	<p style="text-align: right;">http://www.cpalms.org/Public/PreviewResource/Preview/36233</p> <p>This lesson introduces students to dividing with 2 digit divisors. Students are asked to apply strategies that they learned in dividing with 1 digit divisors such as partial quotients or breaking numbers apart using the distributive property.</p>

	<p><u>MAFS.5.NBT.2.6:</u> 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.</p>
<p>Make a Funny Partial Quotient Division Story</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/72731</p> <p>This lesson introduces students to the area model and the partial quotient model to solve division problems with 2-digit divisors. Students are asked to apply both strategies to solve funny division problems that they help create by inserting information that is left blank in the story problems.</p> <p><u>MAFS.5.NBT.2.6:</u> 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.</p>
<p>What Are They Thinking? Understanding Division</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/40001</p> <p>This lesson uses a discovery approach to exploring the meaning of division. The students will utilize math practice standards as they analyze math solutions and explain their own solutions.</p> <p><u>MAFS.5.NBT.2.6:</u> 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</p>

	<p>the calculation by using equations, rectangular arrays, and/or area models.</p>
<p>Patty's Party Planning</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/47915</p> <p>Students will help a party planner determine which party location is the best one to use for this situation. They will calculate the cost of the banquet hall rental based on the number of people, number of tables and hourly rental of the location by using division and multiplication.</p> <p><u>MAFS.5.NBT.2.6:</u> 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.</p>

Formative Assessments for MAFS.5.NBT.2.6

<p>Driving to Alaska</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58634</p> <p>Students are asked to solve a division word problem with a two-digit divisor using a strategy based on place value.</p>
<p>Analyzing and Applying Division</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58640</p> <p>Students are asked to analyze and explain another student's division work in terms of a partial quotients strategy and to apply this strategy to another division problem.</p>
<p>Dividing Using an Area Model with Larger Divisors</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58633</p> <p>Students are asked to interpret a division problem with a two-digit divisor that has been completed using an area model. If the student is successful, he or she is asked to determine the solution to a division problem with a two-digit divisor using an area model.</p>
<p>Dividing Using Place Value With Larger Divisors</p>	<p>http://www.cpalms.org/Public/PreviewResource/Preview/58632</p> <p>Students are asked to complete a division problem using place value.</p>

Supply List

Suggested class supplies for each student

Math Notebook/Journal
Math Folder
Scissors
Construction paper
Colored pencils
Pencils
Index cards
Place value charts thru hundredths
Rulers

Number and Operations in Base Ten

(class set) place value blocks
place value charts
dimes, pennies to relate to decimal value