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| **Prerequisite Skills**  **(Grade 3)** | **Unit Four Standards**  **Grade 4** | **Looking Ahead**  **(Grade 5)** |
| Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.  Fluently multiply and divide within 100. By the end of 3rd grade know from memory all products of two one-digit number. | Operations and Algebraic Thinking 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.   * I can represent situations using variables to replace unknowns. * I can interpret remainders. * I can choose the correct operation(s) to solve a word problem. * I can use mental math and estimation to determine whether my answer is reasonable. | Fluently multiply multi-digit whole numbers using the standard algorithm.  Find whole number quotients of whole numbers with up to 4 digit dividends and two-digit divisors, using strategies.  Add, subtract, multiply and divide decimals to hundredths. |
| Interpret whole number quotients of whole numbers.  Use division within 100 to solve word problems using arrays, equal groups, and measurement quantities.  Fluently divide within 100, using strategies such as the relationship between multiplication and division. | Number and Operation in Base Ten 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.   * I can illustrate or explain a division problem using an array, area model or equations. * I can divide a multi-digit number by a one digit number. * I can show the relationship between multiplication and division. | Find whole-number quotients of whole numbers with up to 4-digit dividends and two-digit divisors using strategies based on place value, properties of operations, and/or the relationship between multiplication and division. Illustrate and explain division with equations, rectangular arrays, or area model. |

\*In standards that are repeated in several units, the I Can Statements represent a progression of skills to scaffold learning.

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations and Algebraic Thinking 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. | * I can represent situations using variables to replace unknowns. * I can interpret remainders. * I can choose the correct operation(s) to solve a word problem. * I can use mental math and estimation to determine whether my answer is reasonable. |  |  |  |  |  | | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | The focus in this standard is to have students use and discuss various strategies. It refers to **estimation** strategies, including using compatible numbers (numbers that sum to 10 or 100) or rounding. Problems should be structured so that all acceptable estimation strategies will arrive at a reasonable answer. Students need many opportunities solving multistep story problems using all four operations.  Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies include, but are not limited to:   |  | | --- | | **Front-End Estimation** **with Adjusting:** using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts. | | **Clustering Around an Average:** when the values are close together an average value is selected and multiplied by the number of values to determine an estimate. | | **Rounding and Adjusting:** students round down or round up and then adjust their estimate depending on how much the rounding affected the original values. | | **Using Friendly or Compatible Numbers (such as factors):** students seek to fit numbers together - rounding to factors and grouping numbers together that have round sums like 100 or 1000. | | **Using Easy to Compute Benchmark Numbers**: students select close whole numbers for fractions or decimals to determine an estimate. | |  | | | | | | **Example:** On a vacation, your family travels 267 miles on the first day, 194 miles on the second day and 34 miles on the third day. How many miles did they travel total? | | | | | **Student 1**  I first thought about 267 and 34. I noticed that their sum is about 300. Then I knew that 194 is close to 200. When I put 300 and 200 together, I get 500. | **Student 2**  I first thought about 194. It is really close to 200. I also have 2 hundreds in 267. That gives me a total of 4 hundreds. Then I have 67 in 267 and the 34. When I put 67 and 34 together that is really close to 100. When I add that hundred to the 4 hundreds that I already end up with 500. | | **Student 3**  I rounded 267 to 300. I rounded 194 to 200. I rounded 34 to 30. When I added 300, 200 and 30,  I know my answer will be about 530. | | **This standard references interpreting remainders. Remainders should be put into context for interpretation. ways to address remainders:**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Remain as a left over | Partitioned into fractions or decimals | Discarded leaving only the whole number answer | Increase the whole number answer up one | Round to the nearest whole number for an approximate result | | | | | | **Example:** Write different word problems involving **44** ÷ **6 = ?** where the answers are best represented as: | | | | | **Problem B: 7 r 2** | | **Problem D: 7 or 8** | | | Mary had 44 pencils. Six pencils fit into each of her pencil pouches. How many pouches could she fill and how many pencils would she have left? 44 *÷ 6 = p; p = 7 r 2; Mary* *can fill 7 pouches and have 2 left over.* | | Mary had 44 pencils. She divided them equally among her friends before giving one of the leftovers to each of her friends. How many pencils could her friends have received? 44 *÷ 6 = p; p = 7 r 2; Some of her friends received 7 pencils. Two friends received 8* *pencils.* | |  |  |  |  |  | | --- | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 3** | | | | | Unit 8 Inv 3 | [Multi-step problems w/o multiplication & division story bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Multi%20Step%20Word%20Problems%20without%20Multiplication%20and%20Division.docx) | [Multi-step story problems with multiplication & division story problem bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Multi%20Step%20Word%20Problems%20with%20Multiplication%20and%20Division.docx) | Unit 3 Inv 2 |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them4.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics1.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically1.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision5.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure5.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operation in Base Ten 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. | * I can illustrate or explain a division problem using an array, area model or equations. * I can divide a multi-digit number by a one digit number. * I can show the relationship between multiplication and division. |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | | | Students build on their third grade work with division within 100. Students need opportunities to develop their understandings by using problems in and out of context. | | | | | | | **Example: A 4th grade teacher bought 4 new pencil boxes. She has 260 pencils. She wants to put the pencils in the boxes so that each box has the same number of pencils. How many pencils will there be in each box?** | | | | | | | **Using Base 10 Blocks** | | **Using Place Value** | | **Using Multiplication** | | | Students build 260 with base 10 blocks and distribute them into 4 equal groups. Some students may need to trade the 2 hundreds for tens but others may easily recognize that 200 divided by 4 is 50. | | 260 ÷ 4 = (200 ÷ 4) + (60 ÷ 4) | | 4 x 50 = 200, 4 x 10 = 40, 4 x 5 = 20; 50 + 10 + 5 = 65;  so 260 ÷ 4 = 65 | | | **This standard calls for students to explore division through various strategies.** | | | | | | | **Student A**  592 divided by 8  There are 70 8’s in 560  592 - 560 = 32  There are 4 8’s in 32  70 + 4 = 74 | **Student B**  592 divided by 8  I know that 10 8’s is 80  If I take out 50 8’s that is 400  592 - 400 = 192  I can take out 20 more 8’s which is 160  192 - 160 = 32  8 goes into 32 4 times. I have none left  I took out 50, then 20 more, then 4 more. That’s 74 | |  | | **Student C**  I want to get to 592  8 x 25 = 200  8 x 25 = 200  8 x 25 = 200  200 + 200 + 200 = 600  600 - 8 = 592  I had 75 groups of 8 and took one away, so  there are 74 teams |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 6** | | | | The Super Source Base Ten Blocks Page 46 – 49 | [Division Story Problem Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Division%20Problem%20Bank.docx) | [Strategies for multi-digit division](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Strategies%20for%20Multi%20Digit%20Division.doc) | | Partner Games: Grade 4, Keep the Leftovers page 24 -2 6 | [Partial Quotients](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Partial%20Quotients.doc) | Unit 3 Inv 2 | | Unit 8 Inv 3 |  |  |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them4.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics1.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically1.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision5.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure5.html) | |

**Optional Whole Group Lesson Progression**

Unit Pacing: 6 weeks

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| **Resource** | **Location** | | **Primary Focus** | **Standard** |
| **Review standard algorithm for subtraction at the beginning of this unit. Identify students who will require small group instruction on subtraction throughout this unit.** | | | | |
| Investigations | | Unit 3   * Inv 2 | * I can represent situations using variables to replace unknowns. * I can interpret remainders. * I can choose the correct operation(s) to solve a word problem. * I can use mental math and estimation to determine whether my answer is reasonable. * I can illustrate or explain a division problem using an array, area model or equations. * I can divide a multi-digit number by a one digit number. * I can show the relationship between multiplication and division. | 4.OA.3  4.NBT.6 |
| Investigations | | Unit 8   * Inv 3 | * I can represent situations using variables to replace unknowns. * I can interpret remainders. * I can choose the correct operation(s) to solve a word problem. * I can use mental math and estimation to determine whether my answer is reasonable. * I can illustrate or explain a division problem using an array, area model or equations. * I can divide a multi-digit number by a one digit number. * I can show the relationship between multiplication and division. | 4.OA.3  4.NBT.6 |
| [Division Story Problem Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Division%20Problem%20Bank.docx)  [Strategies for multi-digit division](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%204/Strategies%20for%20Multi%20Digit%20Division.doc) | | DMPS Math Website | Introduce the “Using Groups of the Divisor” strategy and use to solve word problems. Include problems in which the remainder must be interpreted. | 4.OA.3  4.NBT.6 |

**\*Unit pacing is approximate. Some lessons may take more than one day. Use teacher discretion based on student need when planning unit length.**