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| **Prerequisite Skills**  **(Grade 3)** | **Unit One 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 1: Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.   * I can interpret a multiplication equation as a comparison. * I can write a multiplication equation based on given data. | 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. |
| Operations and Algebraic Thinking 2: Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.   * I can solve word problems using multiplicative comparison. |
| Solve two-step word problems using the four operations. Represent with equations, using a variable to stand for the unknown.  Assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Operations and Algebraic Thinking 3: Solve multi-step 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 choose the correct operations to solve a multi-step word problem. * I can use mental math and estimation to determine whether my answer is reasonable. |
| Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. | Operations in Algebraic Thinking 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.   * I can recognize prime and composite numbers up to 100. * I can write the factors of a number up to 100. * I can show that a whole number is a multiple of each of its factors. * I can check to see if a given whole number is a multiple of another number. | Apply and extend previous understandings of multiplication and division to multiply and divide fractions. |
| Identify and explain arithmetic patterns (including patterns in the addition and multiplication table). | Operations and Algebraic Thinking 5**:** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule “Add 3” and the starting number 1, generate* *terms in the resulting sequence and observe that the terms appear to* *alternate between odd and even numbers. Explain informally why the* *numbers will continue to alternate in this way.*   * I can continue a given number or shape pattern. * I can make a number or shape pattern that follows a given rule. * I can explain how different patterns are built. * I can analyze a pattern to determine parts not stated in the rule. | Generate two numerical patterns using two given rules. Identify relationships between corresponding terms. From ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. |

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| **Prerequisite Skills**  **(Grade 3)** | **Unit One Standards (Continued)**  **Grade 4** | **Looking Ahead**  **(Grade 5)** |
| 2nd grade: understand the three digits of a three-digit number represents hundreds, tens and ones.  \*There are no standards addressing place value in 3rd grade. Will need to be incorporated in DMR. | Number and Operations in Base Ten 2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.   * I can read and write numbers in standard form up to one million. * I can read and write numbers in word form up to one million. * I can read and write numbers in expanded form up to one million. * I can compare two numbers with digits up to one million and identify whether they are less than, greater than, or equal to another number. | Recognize that in a multi-digit number. A digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents to the left.  Read, write and compare decimals to thousandths using base-ten numerals, number names, and expanded form. |
| Round whole numbers to nearest 10 or 100. | Number and Operations in Base Ten 3: Use place value understanding to round multi-digit whole numbers to any place.   * I can round numbers, up to one million, to any given place value. | Use place value understanding to round decimals to any place. |
| Fluently add and subtract within 1000 using strategies: place value, properties of operations, or relationship of addition and subtraction. | Number and Operations in Base Ten 4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.   * I can add numbers up to a million. * I can subtract numbers up to a million. | Fraction and Decimal – All four operations. |

\*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 1:  Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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. | * I can interpret a multiplication equation as a comparison. * I can write a multiplication equation based on given data. |  |  | | --- | | **What does this standard mean the students will know and be able to do?** | | A **multiplicative comparison** is a situation in which one quantity is multiplied by a specified number to get another quantity (e.g., ―a is n times as much as b‖). Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times.  Students should be given many opportunities to write and identify equations and statements for multiplicative comparisons. It is essential that students are provided many opportunities to solve contextual problems.  Students need experiences that allow them to connect mathematical statements and number sentences or equations. This allows for an effective transition to formal algebraic concepts. They represent an unknown number in a word problem with a symbol. Word problems which require multiplication or division are solved by using drawings and equations.  Students need to solve word problems involving multiplicative comparison (product unknown, partition unknown) using multiplication or division. They should use drawings or equations with a symbol for the unknown number to represent the problem. Students need to be able to distinguish whether a word problem involves multiplicative comparison or additive comparison (solved when adding and subtracting in Grades 1 and 2). | | **Example:** | | **Multiplicative Comparison**  5 x 8 = 40.  Sally is five years old. Her mom is eight times older. How old is Sally’s Mom?  5 x 5 = 25  Sally has five times as many pencils as Mary. If Sally has 5 pencils, how many does Mary have? |  |  |  | | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 1** | | | Investigations Unit 1 1.6A (CC3-7, C2-C4) |  |  |  |  | | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | [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) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations and Algebraic Thinking 2:  Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. | * I can solve word problems using multiplicative comparison. |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | This standard calls for students to translate comparative situations into equations with an unknown and solve.  When distinguishing multiplicative comparison from additive comparison, students should note that:   |  |  | | --- | --- | | **Additive Comparisons** | **Multiplicative Comparisons** | | The focus is on the difference between two quantities (e.g., Deb has 3 apples and Karen has 5 apples. How many more apples does Karen have?). A simple way to remember this is, ―How many more? | Thefocus is on comparing two quantities by showing that one quantity is a specified number of times larger or smaller than the other (e.g., Deb ran 3 miles. Karen ran 5 times as many miles as Deb. How many miles did Karen run?). A simple way to remember this is ―How many times as much? Or How many times as many? |   **Students need many opportunities to solve contextual problems.**  **Example:** *A blue hat costs $6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost?*  In solving this problem, the student should identify $6 as the quantity that is being multiplied by 3. The student should write the problem using a symbol to represent the unknown: $6 x 3 = \_\_\_    **Example:** A *red hat costs $18 and a blue hat costs $6. How many times as much does the red hat cost as the blue hat?*  In solving this problem, the student should identify $18 as the quantity being divided into shares of $6. The student should write the problem using a symbol to represent the unknown: $18 ÷ $6 = \_\_\_ | | | | **Unknown Product** | **Group Size Unknown** | **Number of Groups Unknown** | | A blue scarf costs $3. A red scarf costs 6 times as much. How much does the red scarf cost? (3 x 6 = p). | A book costs $18. That is 3 times more than a DVD. How much does a DVD cost? (18 ÷ p = 3 or 3 x p = 18). | A red scarf costs $18. A blue scarf costs $6. How many times as much does the red scarf cost compared to the blue scarf? (18 ÷ 6 = p or 6 x p = 18). |  |  |  | | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 2** | | | Investigations Unit 1 1.6A (CC3-7, C2-C4) | [Use story problems throughout the unit](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/CGI%204th%20Grade%20Story%20Bank.docx) |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [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) | [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** | | 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 choose the correct operations 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** | | | [Use story problems throughout the unit](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/CGI%204th%20Grade%20Story%20Bank.docx) |  |  |  |  |  | | --- | --- | --- | | **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** | | Operations in Algebraic Thinking 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. | * I can recognize prime and composite numbers up to 100. * I can write the factors of a number up to 100. * I can show that a whole number is a multiple of each of its factors. * I can check to see if a given whole number is a multiple of numbers one through nine. |  |  | | --- | | **What does this standard mean the students will know and be able to do?** | | This standard requires students to demonstrate understanding of factors and multiples of whole numbers. This standard also refers to prime and composite numbers. Prime numbers have exactly two factors, the number one and their own number. For example, the number 17 has the factors of 1 and 17. Composite numbers have more than two factors. For example, 8 has the factors 1, 2, 4, and 8.  Students investigate whether numbers are prime or composite by  • building rectangles (arrays) with the given area and finding which numbers have more than two rectangles (e.g. 7 can be made into only 2 rectangles, 1 x 7 and 7 x 1, therefore it is a prime number)  • finding factors of the number  Students should understand the process of finding factor pairs so they can do this for any number 1 – 100.  **Example**:  *Factors of 24:* 1, 2, 3, 4, 6, 8,12, 24  *Multiples of 4*: 4, 8, 12, 16, 20, 24  To determine if a number between 1-100 is a multiple of a given one-digit number, some helpful hints include the following:  • all even numbers are multiples of 2  • all even numbers that can be halved twice (with a whole number result) are multiples of 4  • all numbers ending in 0 or 5 are multiples of 5 |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 4** | | | | Unit 1: Investigations 1, 2, 3 | Unit 1: Investigations 2 | Unit 1: Investigations 3 |  | | [Prime and Common Factors](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20and%20Common%20Factors.pdf) | [Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Factor%20Riddles.pdf) | [Prime or Composite](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20or%20Composite.pdf) | | [More Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/More%20Factor%20Riddles.pdf) | [A “Wheely” Neat Way to Look at Multiplication](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/A%20Wheely%20Neat%20Way%20to%20Look%20at%20Multiplication.pdf) | [Dizzy About Patterns](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Dizzy%20About%20Patterns.pdf) |  |  |  |  | | --- | --- | --- | | **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 Objective** | | Operations and Algebraic Thinking 5**:**  Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule “Add 3” and the starting number 1, generate* *terms in the resulting sequence and observe that the terms appear to* *alternate between odd and even numbers. Explain informally why the* *numbers will continue to alternate in this way.* | * I can continue a given number or shape pattern. * I can make a number or shape pattern that follows a given rule. * I can explain how different patterns are built. * I can analyze a pattern to determine parts not stated in the rule. |  |  |  |  |  | | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | Patterns involving numbers or symbols either repeat or grow. Students need multiple opportunities creating and extending number and shape patterns. Numerical patterns allow students to reinforce facts and develop fluency with operations.  Patterns and rules are related. A pattern is a sequence that repeats the same process over and over. A rule dictates what that process will look like. Students investigate different patterns to find rules, identify features in the patterns, and justify the reason for those features.  After students have identified rules and features from patterns, they need to generate a numerical or shape pattern from a given rule. In this standard, students **describe** features of an arithmetic number pattern or shape pattern byidentifying the rule, and features that are not explicit in the rule. A t-chart is a tool to helpstudents see number patterns. | | |  |  |  | | --- | --- | --- | | **Pattern** | **Rule** | **Feature(s)** | | 3, 8, 13, 18,  23, 28, … | Start with 3,  add 5 | The numbers alternately end with a 3 or 8. | | 5, 10, 15, 20  …. | Start with 5,  add 5 | The numbers are multiples of 5 and end with either 0 or 5. The numbers that end with 5 are products of 5 and an odd number. The numbers that end in 0 are products of 5 and an even number. | | | | **Example:** | | | | | **Example A** | **Example B** | | | | Rule: Starting at 1, create a pattern that starts at 1 and multiplies each number by 3. Stop when you have 6 numbers.  Students write 1, 3, 9, 27, 81, 243. Students notice that all the numbers are odd and that the sums of the digits of the 2 digit numbers are each 9. Some students might investigate this beyond 6 numbers. Another feature to investigate is the patterns in the differences of the numbers (3 - 1 = 2, 9 - 3 = 6, 27 - 9 = 18, etc). | There are 4 beans in the jar. Each day 3 beans are added. How many beans are in the jar for each of the first 5? | | |  |  |  | | --- | --- | --- | | Day | Operations | Beans | | 0 | 3x0+4 | 4 | | 1 | 3x1+4 | 7 | | 2 | 3x2+4 | 10 | | 3 | 3x3+4 | 13 | | 4 | 3x4+4 | 16 | | 5 | 3x5+4 | 19 | |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 5** | | | | Unit 9 Inv 2 (merge lesson activities to directly instruct the standard – constant change) | [A “Wheely” Neat Way to Look at Multiplication](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/A%20Wheely%20Neat%20Way%20to%20Look%20at%20Multiplication.pdf) | [Dizzy About Patterns](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Dizzy%20About%20Patterns.pdf) | | [Prime and Common Factors](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20and%20Common%20Factors.pdf) | [Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Factor%20Riddles.pdf) | [Prime or Composite](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20or%20Composite.pdf) | | [More Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/More%20Factor%20Riddles.pdf) |  |  |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [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) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations in Base Ten 2:  Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. | * I can read and write numbers in standard form up to one million. * I can read and write numbers in word form up to one million. * I can read and write numbers in expanded form up to one million. * I can compare two numbers with digits up to one million and identify whether they are less than, greater than, or equal to another number. |      |  | | --- | | **What does this standard mean the students will know and be able to do?** | | This standard refers to various ways to write numbers. Students should have flexibility with the different number forms.  Traditional expanded form is 285 = 200 + 80 + 5.  Written form is two hundred eighty-five.  However, students should have opportunities to explore the idea that 285 could also be 28 tens plus 5 ones or 1 hundred, 18 tens, and 5 ones.  Students should also be able to compare two multi-digit whole numbers using appropriate symbols.  The expanded form of 275 is 200 + 70 + 5. Students use place value to compare numbers. For example, in comparing 34,570 and 34,192, a student might say, both numbers have the same value of 10,000s and the same value of 1000s however, the value in the 100s place is different so that is where I would compare the two numbers. |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 2** | | | | Address this concept through CC adaptations in Unit 5 Inv 1.2, 1.3, and 1.4 – including expanded form | [Khan Video](http://www.youtube.com/watch?v=iK0y39rjBgQ&safe=active) | [Puzzling Places (Independent Practice)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Puzzling%20Places%20Independent%20Practice.pdf) | | [Puzzle Party](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Puzzle%20Party.pdf) | [City Populations (Independent Practice)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/City%20Populations%20Independent%20Practice.pdf) | [Metric Measures Large and Small](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Metric%20Measures%20Large%20and%20Small.pdf) | | [Reading, Writing + Comparing Numbers](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Reading%20Writing%20and%20Comparing%20Numbers.pdf) | [Target 5](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Target%205.pdf) | [I Have Who Has](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/I%20Have%20Who%20Has.pdf) |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [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) | [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 Objective** | | Number and Operations in Base Ten 3:  Use place value understanding to round multi-digit whole numbers to any place. | * I can round numbers, up to one million, to any given place value |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | This standard refers to place value understanding, which extends **beyond** an algorithm or procedure for rounding. The expectation is that students have a deep understanding of place value and number sense and can explain and reason about the answers they get when they round. Students should have numerous experiences using a number line and a hundreds chart as tools to support their work with rounding. | | | | **Example:**  **Your class is collecting bottled water for a service project. The goal is to collect 300 bottles of water. On the first day, Max brings in 3 packs with 6 bottles in each container. Sarah wheels in 6 packs with 6 bottles in each container. About how many bottles of water still need to be collected?** | | | | **Example A**  First, I multiplied 3 and 6 which equals 18. Then I multiplied 6 and 6 which is 36. I know 18 plus 36 is about 50. I’m trying to get to 300. 50 plus another 50 is 100. Then I need 2 more hundreds. So we still need 250 bottles. | **Example B**  First, I multiplied 3 and 6 which equals 18. Then I multiplied 6 and 6 which is 36. I know 18 is about 20 and 36 is about 40. 40+20=60. 300- 60 = 240, so we need about 240 more bottles. | | | **Example 2:**  **Round 368 to the nearest hundred.** | | | | This will either be 300 or 400, since those are the two hundreds before and after 368.  Draw a number line, subdivide it as much as necessary, and determine whether 368 is closer to 300 or 400.  Since 368 is closer to 400, this number should be rounded to 400. | |  |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 3** | | | | Unit 5 1.5A | [Kilometers and Miles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Kilometers%20and%20Miles.pdf) | [Decode the Message](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Decoding%20the%20Message.pdf) | | [Using Compatible Numbers](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Using%20Compatible%20Numbers.pdf) | [Rounding 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Rouding%202.pdf) | [Rounding 3](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Rounding%203.pdf) |  |  |  | | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision5.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objective** | | Number and Operations in Base Ten 4:  **Fluently** add and subtract multi-digit whole numbers **using the standard algorithm.** | * I can add numbers up to a million. * I can subtract numbers up to a million. |  |  |  | | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | Students build on their understanding of addition and subtraction, their use of place value and their flexibility with multiple strategies to make sense of the standard algorithm. They continue to use place value in describing and justifying the processes they use to add and subtract.  This standard refers to fluency, which means accuracy and efficiency (using a reasonable amount of steps and time), and flexibility (using a variety strategies such as the distributive property, decomposing and recomposing numbers, etc.). This is the first grade level in which students are expected to be proficient at using the standard algorithm to add and subtract. However, other previously learned strategies are still appropriate for students to use. When students begin using the standard algorithm their explanation may be quite lengthy. After much practice with using place value to justify their steps, they will develop fluency with the algorithm.  **Students should be able to explain why the algorithm works.** A crucial theme in multi-digit arithmetic is encouraging students to develop *strategies* that they understand, can explain, and can think about, rather than merely follow a sequence of directions, rules or procedures that they don't understand. It is important for students to have seen and used a variety of strategies and materials to broaden and deepen their understanding of place value before they are required to use standard algorithms. The goal is for them to *understand* all the steps in the algorithm, and they should be able to explain the meaning of each digit.  **Note: Students should know that it is mathematically possible to subtract a larger number from a smaller number but that their work with whole numbers does not allow this as the difference would result in a negative number.** | | | **Example A: 3,892 + 1567** | **Example: 3,546 - 928** | | **Student explanation for this problem:**  1. Two ones plus seven ones is nine ones.  2. Nine tens plus six tens is 15 tens.  3. I am going to write down five tens and think of the10 tens as one more hundred. (notates with a 1 above the hundreds column)  4. Eight hundreds plus five hundreds plus the extra hundred from adding the tens is 14 hundreds.  5. I am going to write the four hundreds and think of the 10 hundreds as one more 1000. (notates with a 1 above the thousands column)  6. Three thousands plus one thousand plus the extra thousand from the hundreds is five thousand. | **Student explanation for this problem:**  1. There are not enough ones to take 8 ones from 6 ones so I have to use one ten as 10 ones. Now I have 3 tens and 16 ones. (Marks through the 4 and notates with a 3 above the 4 and writes a 1 above the ones column to be represented as 16 ones.)  2. Sixteen ones minus 8 ones is 8 ones. (Writes an 8 in the ones column of answer.)  3. Three tens minus 2 tens is one ten. (Writes a 1 in the tens column of answer.)  4. There are not enough hundreds to take 9 hundreds from 5 hundreds so I have to use one thousand as 10 hundreds. (Marks through the 3 and notates with a 2 above it. (Writes down a 1 above the hundreds column.) Now I have 2 thousand and 15 hundreds.  5. Fifteen hundreds minus 9 hundreds is 6 hundreds. (Writes a 6 in the hundreds column of the answer).  6. I have 2 thousands left since I did not have to take away any thousands. (Writes 2 in the thousands place of answer.) |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 4** | | | | Refer to 4th grade Unit 5 Session 2.4 (addition) | Refer to 5th grade Unit 3 Session 2.4 (Resource Binder p. 7 – 9 – subtraction) | \*Unit 5 Inv 3 – may use to develop conceptual base for standard algorithms |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically1.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure5.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

**Optional Lesson Progression**

Unit Pacing: 7 weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| Investigations | Address this concept through CC adaptations in Unit 5   * Inv 1.2, 1.3, 1.4 – including expanded form | * I can read and write numbers in expanded form up to a million. * I can read and write numbers in word form up to one million. * I can read and write numbers in standard form up to one million. * I can compare two numbers with digits up to one million and identify whether they are less than, greater than, or equal to another number. | 4.NBT.2 |
| Websites: optional  (select activities to meet student need) | * [Puzzle Party](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Puzzle%20Party.pdf) * [Reading, Writing + Comparing Numbers](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Reading%20Writing%20and%20Comparing%20Numbers.pdf) * [Khan Video](http://www.youtube.com/watch?v=iK0y39rjBgQ&safe=active) * [City Populations (Independent Practice)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/City%20Populations%20Independent%20Practice.pdf) * [Target 5](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Target%205.pdf) * [Puzzling Places (Independent Practice)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Puzzling%20Places%20Independent%20Practice.pdf)[I [I Have Who Has](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/I%20Have%20Who%20Has.pdf)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/I%20Have%20Who%20Has.pdf) | * I can read and write numbers in expanded form up to a million. * I can read and write numbers in word form up to one million. * I can read and write numbers in standard form up to one million. * I can compare two numbers with digits up to one million and identify whether they are less than, greater than, or equal to another number. | 4.NBT.2 |
| Investigations | Unit 5   * Inv 1.5A | * I can round numbers, up to one million, to any given place value. | 4.NBT.3 |
| Websites | * [Using Compatible Numbers](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Using%20Compatible%20Numbers.pdf) * [Kilometers and Miles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Kilometers%20and%20Miles.pdf) * [Rounding 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Rouding%202.pdf) * [Decode the Message](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Decoding%20the%20Message.pdf) * [Rounding 3](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Rounding%203.pdf) | * I can round numbers, up to one million, to any given place value. | 4.NBT.3 |
| Teacher Teams will need to find or create more experiences for students to practice this concept. | | * I can add numbers to a million. | 4.NBT.4 |
| Investigations | Unit 5   * Inv 3 – may use to develop conceptual base for standard algorithms | * I can add numbers to a million. * I can subtract numbers to a million. | 4.NBT.4 |
| Investigations | Refer to Unit 5 Inv 2.4 | * I can add numbers to a million. | 4.NBT.4 |
| Investigations | Refer to 5th grade Unit 3 Session 2.4 | * I can subtract numbers to a million. | 4.NBT.4 |
| Investigations | Unit 1   * Inv 1.6A (CC3-7, C2-C4) | * I can interpret a multiplication equation as a comparison. * I can write a multiplication equation based on given data. * I can solve word problems using multiplicative comparison. | 4.OA.1  4.OA.2 |
| Problem Bank | [Use story problems throughout the unit](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/CGI%204th%20Grade%20Story%20Bank.docx) (use lesson model from 1.6A to interpret, write equation, and solve) |
| Investigations | Unit 1   * Inv 1 * Inv 2 * Inv 3 | * I can recognize prime and composite numbers up to 100. * I can write factors of a number up to 100. * I can show that a whole number is a multiple of each of its factors. * I can check to see if a given number is a multiple of numbers one through nine. | 4.OA.4 |

**Optional Lesson Progression (Continued)**

Unit Pacing: 7 weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| Websites: optional | * [Prime and Common Factors](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20and%20Common%20Factors.pdf) * [More Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/More%20Factor%20Riddles.pdf) * [Factor Riddles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Factor%20Riddles.pdf) * [A “Wheely” Neat Way to Look at Multiplication](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/A%20Wheely%20Neat%20Way%20to%20Look%20at%20Multiplication.pdf) * [Prime or Composite](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Prime%20or%20Composite.pdf) * [Dizzy About Patterns](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/Unit%201/Dizzy%20About%20Patterns.pdf) | * I can recognize prime and composite numbers up to 100. * I can write factors of a number up to 100. * I can show that a whole number is a multiple of each of its factors. * I can check to see if a given number is a multiple of numbers one through nine. | 4.OA.4 |
| Problem Bank | [Use story problems throughout the unit](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/4th%20Grade/CGI%204th%20Grade%20Story%20Bank.docx) | * I can represent situations using variables to replace unknowns. * I can choose the correct operations to solve a word problem. * I can use mental math and estimation to determine whether my answer is reasonable. | 4.OA.3 |
| Investigations | Unit 9   * Inv 2 (merge lesson activities to directly instruct the standard – constant change) | * I can continue a given number or shape pattern. * I can make a number or shape pattern that follows a given rule. * I can explain how different patterns are built. * I can analyze a pattern to determine parts not stated in the rule. | 4.OA.5 |

**\*Units are designed for one lesson per day. This is an approximate. Some lessons may take more than one day. Use teacher discretion based on student need when planning unit length.**