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| **Prerequisite Skills**  **(Grade 2)** | | **Unit Five Standards**  **Grade 3** | **Looking Ahead**  **(Grade 4)** |
| Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions*,* e.g., by using drawings and equations with a symbol for the unknown number to represent the problem*.* | Operations in Algebraic Thinking 3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.   * I can multiply to solve word problems. * I can divide to solve word problems. * I can decide when to multiply or divide to solve word problems. | | 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. |
| Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; Write an equation to express the total as a sum of equal addends. | Operations in Algebraic Thinking 4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the* *unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 =* ? *÷ 3, 6 × 6 = \_\_\_\_*   * I can find the missing number in a multiplication problem. * I can find the missing number in a division problem. | | 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. |
| Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; Write an equation to express the total as a sum of equal addends. | Operations in Algebraic Thinking 6: Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*   * I can identify how the multiplication problem is related to a division problem. * I can use multiplication to solve division problems. * I can recognize and explain the relationship between multiplication and division. | | 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. |
| Operations in Algebraic Thinking 7: 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. By the end of Grade 3, know from memory all products of two one-digit numbers.   * I can fluently recall multiplication facts. This means I know from memory all products of two one-digit numbers. * I can fluently multiply using properties and strategies. * I can fluently divide using properties and strategies. | |
| Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. | Operations in Algebraic Thinking 8: Solve two-step word problems using the four operations. 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 construct an equation with a letter standing for the unknown quantity. * I can solve two-step word problems using the four operations. * I can justify my answer using estimation strategies and mental computation. | | 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. |

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| **Prerequisite Skills**  **(Grade 2)** | **Unit Five Standards**  **Grade 3** | **Looking Ahead**  **(Grade 4)** |
| Understand place value. | Number and Operations in Base Ten 3: Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.   * I can identify strategies to multiply one-digit numbers by multiples of 10. * I can use place value to multiply one-digit whole numbers by multiples of 10. | Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. |
| Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems4 using information presented in a bar graph. | Measurement and Data 3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.   * I can solve one-step “how many more” problems using information from a scaled bar graph. * I can solve one-step “how many less” problems using information from a scaled bar graph. * I can solve two-step “how many more” problems using information from a scaled bar graph. * I can solve two-step “how many less” problems using information from a scaled bar graph. * I can draw a scaled picture graph to represent a data set with several categories. * I can draw a scaled bar graph to represent a data set with several categories. | 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. |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations in Algebraic Thinking 3:  Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. | * I can multiply to solve word problems. * I can divide to solve word problems. * I can decide when to multiply or divide to solve word problems. |  |  |  |  |  | | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | This standard references various strategies that can be used to solve word problems involving multiplication & division. Students should apply their skills to solve word problems. Students should use a variety of representations for creating and solving one-step word problems, such as: If you divide 4 packs of 9 brownies among 6 people, how many brownies does each person receive? (4 x 9 = 36, 36 ÷ 6 = 6).  Students in third grade students should use a variety of pictures, such as stars, boxes, flowers to represent unknown numbers (variables). Letters are also introduced to represent unknowns in third grade. | | | | | **Examples of Multiplication:**  **There are 24 desks in the classroom. If the teacher puts 6 desks in each row, how many rows are there?** | | **Examples of Division:** | | | This task can be solved by drawing an array by putting 6 desks in each row. | This task can also be solved by drawing pictures of equal groups. 4 groups of 6 equals 24 objects. | There are some students at recess. The teacher divides the class into 4 lines with 6 students in each line. Write a division equation for this story and determine how many students are in the class ( ÷ 4 = 6. There are 24 students in the class). | The bag has 92 hair clips, and Laura and her three friends want to share them equally. How many hair clips will each person receive? Determining the number of shares (measurement division, where the number of groups is unknown) |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 3** | | | | [Beginning Multiplication, Chapter 2 – Kathy Richardson](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Beginning%20Multiplication%20Chapter%202%20Kathy%20Richardson.pdf) | [Beginning Division, Chapter 3 – Kathy Richardson](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Beginning%20Division%20Chapter%203%20Kathy%20Richardson.pdf) | [CGI Multi-Step Problem Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Multi%20Step%20Problem%20Bank.docx) | | [Khan Video](http://www.youtube.com/watch?v=4I9iibPLdBw&safe=active) | [Looking for Equal Groups in the Real World, Activity 2.1](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Activity%202_1%20Lookinf%20for%20Equal%20Groups%20in%20the%20Real%20World.pdf) | [Patterns and Multiples](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Patterns%20and%20Multiples.pdf) | | [Introducing Concepts of Multiplication and Division](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Introducing%20Concepts%20of%20Multiplication%20and%20Division.pdf) | [Arrays and Slide Arrays](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Multiplication%20and%20Division%20Fact%20Activities.docx) | [Candy Boxes](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Candy%20Boxes.pdf) | | [Circles and Stars](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Circle%20and%20Stars.pdf) | [-Circles and Numbers (variation)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Multiplication%20and%20Division%20Fact%20Activities.docx)  [-Circles and Numbers – distributive (variation)](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Multiplication%20and%20Division%20Fact%20Activities.docx) | [Multiplying and Dividing on the Number Line](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Multiplying%20and%20Dividing%20on%20the%20Number%20Line.pdf) | | [Khan Video 2](http://www.youtube.com/watch?v=MTzTqvzWzm8&safe=active) | [The Pet Store](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/The%20Pet%20Store.pdf) |  | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf)  [Multiplication and Division Chapter 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf) | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf)  [Multiplication and Division Chapter 3](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf) | [Mastering the Basic Math Facts 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8](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | [Mastering the Basic Facts in Multiplication and Division Chapter 9](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2010%20Multiplying%20by%209.pdf) | | [Mastering the Basic Facts in Multiplication and Division Chapter 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%206%20Multiplying%20by%2010.pdf) | [4th Grade Multiplication and Division Story Bank](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) |  | | **These are many of the same activities that are listed for OA.3 in Unit Two. Use pre-assessment data to drive instructional decisions about mastery and gaps.** | | |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | 1. Make sense of problems and persevere in solving them. | 4. Model with mathematics. | 7. Look for and make use of structure. | |

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| **Standard** | | | **Learner Objectives** | | |
| Operations in Algebraic Thinking 4:  Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the* *unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 =* ? *÷ 3, 6 × 6 = \_\_\_\_* | | | * I can find the missing number in a multiplication problem. * I can find the missing number in a division problem. | | |
| **What does this standard mean the students will know and be able to do?** | | | | | |
| This standard refers to Table 2 page 58 of this document and equations for the different types of multiplication and division problem structures. The easiest problem structure includes **Unknown Product** (3 x 6 = ? or 18 ÷ 3 = 6). The more difficult problem structures include **Group Size Unknown** (3 x ? = 18 or 18 ÷ 3 = 6) or Number of Groups Unknown (? x 6 = 18, 18 ÷ 6 = 3).  The focus of this standard goes beyond the traditional notion of fact families, by having students explore the **inverse relationship** of multiplication and division.  Students apply their understanding of the meaning of the equal sign as “the same as” to interpret an equation with an unknown. When given 4 x \_\_\_ = 40, they might think:  • 4 groups of some number is the same as 40  • 4 times some number is the same as 40  • I know that 4 groups of 10 is 40 so the unknown number is 10  • The missing factor is 10 because 4 times 10 equals 40.  Equations in the form of a x b = c and c = a x b should be used interchangeably, with the unknown in different positions.  This standard is strongly connected to OA.3 when students solve problems and determine unknowns in equations. Students should also experience creating story problems for given equations. When crafting story problems, they should carefully consider the question(s) to be asked and answered to write an appropriate equation. Students may approach the same story problem differently and write either a multiplication equation or division equation. | | | | | |
| **Examples:** | | | | | |
| Solve the equations below:  24 = € x 6  72 ÷ € = 9 | | | Rachel has 3 bags. There are 4 marbles in each bag. How many marbles does Rachel have altogether? **Solution: 3 x 4 = m** | | |
| **Lessons and Resources for Operations in Algebraic Thinking 4** | | | | | |
| [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf)  [Multiplication and Division Chapter 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf) | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf)  [Multiplication and Division Chapter 3](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf) | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%204%20Multiplying%20by%205.pdf)  [Multiplication and Division Chapter 4](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%204%20Multiplying%20by%205.pdf) | |
| [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%205%20Multiplying%20by%201.pdf)  [Multiplication and Division Chapter 5](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%205%20Multiplying%20by%201.pdf) | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%209%20Multiplying%20by%206.pdf)  [Multiplication and Division Chapter 6](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%209%20Multiplying%20by%206.pdf) | | [CGI Multi-Step Problem Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Multi%20Step%20Problem%20Bank.docx) | |
| [Mastering the Basic Facts in Multiplication and Division Chapter 7](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%207%20Multiplying%20by%203.pdf) | | [Mastering the Basic Facts in Multiplication and Division Chapter 8](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | | [Mastering the Basic Facts in Multiplication and Division Chapter 9](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2010%20Multiplying%20by%209.pdf) | |
| [Mastering the Basic Facts in Multiplication and Division Chapter 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%206%20Multiplying%20by%2010.pdf) | | [4th Grade Multiplication and Division Story Bank](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) | | [Mastering the Basic Math Facts in Multiplication and Division Chapter 11](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | |
| **Use pre-assessment data to drive instructional decisions about mastery and gaps.** | | | | | |
| **Emphasized Standards for Mathematical Practice** | | | | | |
| 1. Make sense of problems and persevere in solving them. | 2. Reason abstractly and quantitatively. | | 6. Attend to precision. | | 7. Look for and make use of structure. |

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| **Standard** | | **Learner Objectives** | |
| Operations in Algebraic Thinking 6:  Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.* | | * I can identify how a multiplication problem related to a division problem. * I can use multiplication to solve division problems. * I can recognize and explain the relationship between multiplication and division. | |
| **What does this standard mean the students will know and be able to do?** | | | |
| Since multiplication and division are inverse operations, students are expected to solve problems and explain their processes of solving division problems that can also be represented as unknown factor in multiplication problems.  Multiplication and division are inverse operations and that understanding can be used to find the unknown. Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient.  Students use their understanding of the meaning of the equal sign as “the same as” to interpret an equation with an unknown. When given 32 ÷ = 4, students may think:   * 4 groups of some number is the same as 32 * 4 times some number is the same as 32 * I know that 4 groups of 8 is 32 so the unknown number is 8 * The missing factor is 8 because 4 times 8 is 32.   Equations in the form of a ÷ b = c and c = a ÷ b need to be used interchangeably, with the unknown in different positions. | | | |
| **Example:** | | | |
| 3 x 5 = 15 5 x 3 = 15 15 ÷ 3 = 5 15 ÷ 5 = 3 | | | |
| **Lessons and Resources for Operations in Algebraic Thinking 6** | | | |
| [Number Puzzles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Number%20Puzzles.pdf)  [More Number Puzzles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/More%20Number%20Puzzles.pdf) | [Using Multiplication](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Using%20Multiplication.pdf) | [Division Fact Families](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Division%20Fact%20Families.pdf) | [Pick a Perfect Product](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Pick%20a%20Perfect.pdf) |
| **Emphasized Standards for Mathematical Practice** | | | |
| 1. Make sense of problems and persevere in solving them. | | 7. Look for and make use of structure. | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations in Algebraic Thinking 7:  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. By the end of Grade 3, know from memory all products of two one-digit numbers. | * I can fluently recall multiplication facts. This means I know from memory all products of two one-digit numbers. * I can fluently multiply using properties and strategies. * I can fluently divide using properties and strategies. |  |  | | --- | | **What does this standard mean the students will know and be able to do?** | |  | | **Example:** | |  |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 7** | | | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf)  [Multiplication and Division Chapter 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%202%20Multiplying%20by%202.pdf) | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf)  [Multiplication and Division Chapter 3](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%203%20Multiplying%20by%201o.pdf) | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%204%20Multiplying%20by%205.pdf)  [Multiplication and Division Chapter 4](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%204%20Multiplying%20by%205.pdf) | | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%205%20Multiplying%20by%201.pdf)  [Multiplication and Division Chapter 5](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%205%20Multiplying%20by%201.pdf) | [Mastering the Basic Math Facts in](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%209%20Multiplying%20by%206.pdf)  [Multiplication and Division Chapter 6](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%209%20Multiplying%20by%206.pdf) | [CGI Multi-Step Problem Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Multi%20Step%20Problem%20Bank.docx) | | [Mastering the Basic Facts in Multiplication and Division Chapter 7](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%207%20Multiplying%20by%203.pdf) | [Mastering the Basic Facts in Multiplication and Division Chapter 8](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | [Mastering the Basic Facts in Multiplication and Division Chapter 9](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2010%20Multiplying%20by%209.pdf) | | [Mastering the Basic Facts in Multiplication and Division Chapter 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%206%20Multiplying%20by%2010.pdf) | [4th Grade Multiplication and Division Story Bank](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) | [Mastering the Basic Math Facts in Multiplication and Division Chapter 11](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | | **Use pre-assessment data to drive instructional decisions about mastery and gaps.** | | |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | 1. Make sense of problems and persevere in solving them. | 4. Model with mathematics. | 7. Look for and make use of structure. | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations and Algebraic Thinking 8:  Solve two-step word problems using the four operations. 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 construct an equation with a letter standing for the unknown quantity. * I can solve two-step word problems using the four operations. * I can justify my answer using estimation strategies and mental computation. |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | This standard refers to two-step word problems using the four operations. Adding and subtracting numbers should include numbers within 1,000, and multiplying and dividing numbers should include single-digit factors and products less than 100.  This standard calls for students to represent problems using equations with a letter to represent unknown quantities.  This standard refers to estimation strategies, including using compatible numbers (numbers that sum to 10, 50, or 100) or rounding. The focus in this standard is to have students use and discuss various strategies. Students should estimate during problem solving, and then revisit their estimate to check for reasonableness.  When students solve word problems, they use various estimation skills which 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 solutions.  Estimation strategies include, but are not limited to:   * using benchmark numbers that are easy to compute * 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) * rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding changed the original values) | | | | **Example:** | | | | Mike runs 2 miles a day. His goal is to run 25 miles. After 5 days, how many miles does Mike have left to run in order to meet his goal? Write an equation and find the solution.  **Solution: 2 x 5 + m = 25** | | | | **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 total miles did they travel?** | | | | Typical Estimation Strategies | | | | **Student A**  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 B**  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 already had, I end up with 500. | **Student C**  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. |  |  |  |  | | --- | --- | --- | | **Lessons and Resources for Operations and Algebraic Thinking 8** | | | | [Addition and Subtraction Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/CGI%20Addition%20and%20Subtraction%20Story%20Bank.docx) | [Multi-Step Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Multi%20Step%20Problem%20Bank.docx) | [4th Grade Multiplication and Division Story Bank](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 pre-assessment data to drive instructional decisions about mastery and gaps. 4th Grade, Unit One students will begin to multiply using the standard algorithm.** | | |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | 1. Make sense of problems and persevere in solving them. | 2. Reason abstractly and quantitatively. | 4. Model with mathematics. | 5. Use appropriate tools strategically. | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations in Base Ten 3:  Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. | * I can identify strategies to multiply one-digit numbers by multiples of 10. * I can use place value to multiply one-digit whole numbers by multiples of 10. |  |  | | --- | | **What does this standard mean the students will know and be able to do?** | | This standard extends students‘ work in multiplication by having them apply their understanding of place value.  This standard expects that students go beyond tricks that hinder understanding such as ―just adding zeros‖ and explain and reason about their products.  For example, for the problem 50 x 4, students should think of this as 4 groups of 5 tens or 20 tens. Twenty tens equals 200.  Students use base ten blocks, diagrams, or hundreds charts to multiply one-digit numbers by multiples of 10 from 10-90. They apply their understanding of multiplication and the meaning of the multiples of 10. For example, 30 is 3 tens and 70 is 7 tens. They can interpret 2 x 40 as 2 groups of 4 tens or 8 groups of ten. They understand that 5 x 60 is 5 groups of 6 tens or 30 tens and know that 30 tens is 300.  After developing this understanding they begin to recognize the patterns in multiplying by multiples of 10. |  |  |  | | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 3** | | | [Single Digits Multiplied by Multiples of Ten](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Single%20Digits%20Multiplied%20by%20Multiples%20of%20Ten.pdf) | [Multiplying by Multiples of Ten](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Multiplying%20by%20Multples%20of%20Ten.pdf) |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | 2. Reason abstractly and quantitatively. | 7. Look for and make use of structure. | 8. Look for and express regularity in repeated reasoning. | |

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| **Standard** | | | **Learner Objective** | | | |
| Measurement and Data 3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. | | | * I can solve one-step “how many more” problems using information from a scaled bar graph. * I can solve one-step “how many less” problems using information from a scaled bar graph. * I can solve two-step “how many more” problems using information from a scaled bar graph. * I can solve two-step “how many less” problems using information from a scaled bar graph. * I can draw a scaled picture graph to represent a data set with several categories. * I can draw a scaled bar graph to represent a data set with several categories. | | | |
| **What does this standard mean the students will know and be able to do?** | | | | | | |
| Students should have opportunities reading and solving problems using scaled graphs before being asked to draw one. Graphs on the next page all use five as the scale interval, but students should experience different intervals to further develop their understanding of scale graphs and number facts.  While exploring data concepts, students should 1)Pose a question, 2)Collect data, 3)Analyze data, and 4)Interpret data (PCAI). Students should be graphing data that is relevant to their lives.  Graphs should include a title, scale, categories, category label, and data. Students need to use both horizontal and vertical bar graphs and pictographs. | | | | | | |
| **Examples of Graphs:**  **If you were to purchase a book for the class library which would be the best genre? Why?** | | | | | | |
| **Scaled Pictograph** | | **Vertical Single Bar Graph** | | | **Horizontal Single Bar Graph** | |
|  | |  | | |  | |
| **Analyze and interpret data which could include:** | | | | | | |
| • How many more nonfiction books where read than fantasy books?  • Did more people read biography and mystery books or fiction and fantasy books?  • About how many books in all genres were read?  • Using the data from the graphs, what type of book was read more often than a mystery but less often than a fairytale? | | | | • What interval was used for this scale?  • What can we say about types of books read? What is a typical type of book read?  • If you were to purchase a book for the class library which would be the best genre? | | |
| **Lessons and Resources for Measurement and Data 3** | | | | | | |
| |  |  |  |  | | --- | --- | --- | --- | | [Pizza Survey](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Pizza%20Survey.pdf) | [Book Lover’s Survey](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Book%20Lovers%20Survey.pdf) | [Eye Color](http://illuminations.nctm.org/LessonDetail.aspx?ID=L169) | [Flavorful Graphing](http://www.beaconlearningcenter.com/Lessons/2277.htm) |   Create opportunities throughout the unit for students to practice creating and analyzing graphs. | | | | | | |
| **Emphasized Standards for Mathematical Practice** | | | | | | |
| 1. Make sense of problems and persevere in solving them. | 4. Model with mathematics. | | | 6. Attend to precision. | | 7. Look for and make use of pattern. |

**Optional Whole Group Lesson Progression**

Unit Pacing: 5 Weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| This unit progression is optional**. It will best fit the students’ needs and abilities if teacher teams pre-assess the students and then create a unit based on the students’ needs.** Several of the activities are the same activities that are listed in Unit 2. It is the teacher’s decision whether to reuse activities if the students need additional practice. Teacher teams also can create/find alternative activities to fit the standards, if they so choose. **Fourth Grade, Unit One students will begin to work with multiplication and the standard algorithm.** | | | |
| [Pizza Survey](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Pizza%20Survey.pdf)  [Book Lover’s Survey](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Book%20Lovers%20Survey.pdf) | Sharepoint | * I can solve one-step “how many more” problems using information from a scaled bar graph. * I can solve one-step “how many less” problems using information from a scaled bar graph. * I can solve two-step “how many more” problems using information from a scaled bar graph. * I can solve two-step “how many less” problems using information from a scaled bar graph. * I can draw a scaled picture graph to represent a data set with several categories. * I can draw a scaled bar graph to represent a data set with several categories. | 3.MD.3 |
| [Addition and Subtraction Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/CGI%20Addition%20and%20Subtraction%20Story%20Bank.docx)  [Multi-Step Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Multi%20Step%20Problem%20Bank.docx)  [4th Grade Multiplication and Division Story Bank](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) | Sharepoint  **(Word Problems should be given on a daily basis)** | * I can multiply to solve word problems. * I can divide to solve word problems. * I can decide when to multiply or divide to solve word problems * I can solve two-step word problems using addition and subtraction * I can justify my answer using estimation strategies and mental computation | 3.OA.3  3.OA.8 |
| [Number Puzzles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Number%20Puzzles.pdf) | Sharepoint |
| [Mastering the Basic Facts in Multiplication and Division Chapter 7](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%207%20Multiplying%20by%203.pdf) | Chapter 7 (x3) | * I can find the missing number in a multiplication problem. * I can find the missing number in a division problem. * I can use multiplication to solve division problems. * I can recognize and explain the relationship between multiplication and division. | 3.0A.4  3.OA.6 |
| [Eye Color](http://illuminations.nctm.org/LessonDetail.aspx?ID=L169) | Website | * I can solve one-step “how many more” problems using information from a scaled bar graph. * I can solve one-step “how many less” problems using information from a scaled bar graph. * I can solve two-step “how many more” problems using information from a scaled bar graph. * I can solve two-step “how many less” problems using information from a scaled bar graph. * I can draw a scaled picture graph to represent a data set with several categories. * I can draw a scaled bar graph to represent a data set with several categories. | 3.MD.3 |
| [Mastering the Basic Facts in Multiplication and Division Chapter 8](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | Chapter 8 (x4) | * I can find the missing number in a multiplication problem. * I can find the missing number in a division problem. * I can use multiplication to solve division problems. * I can recognize and explain the relationship between multiplication and division. | 3.0A.4  3.OA.6 |
| [Flavorful Graphing](http://www.beaconlearningcenter.com/Lessons/2277.htm) | Website | * I can solve one-step “how many more” problems using information from a scaled bar graph. * I can solve one-step “how many less” problems using information from a scaled bar graph. * I can solve two-step “how many more” problems using information from a scaled bar graph. * I can solve two-step “how many less” problems using information from a scaled bar graph. * I can draw a scaled picture graph to represent a data set with several categories. * I can draw a scaled bar graph to represent a data set with several categories. | 3.MD.3 |

**Optional Whole Group Lesson Progression (Continued)**

Unit Pacing: 5 Weeks

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| --- | --- | --- | --- |
| **Resource** | **Location** | **Primary Focus** | **Standard** |
| [Mastering the Basic Facts in Multiplication and Division Chapter 9](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2010%20Multiplying%20by%209.pdf) | Chapter 9 (x6) | * I can find the missing number in a multiplication problem. * I can find the missing number in a division problem. * I can use multiplication to solve division problems. * I can recognize and explain the relationship between multiplication and division | 3.0A.4  3.OA.6 |
| [Mastering the Basic Facts in Multiplication and Division Chapter 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%206%20Multiplying%20by%2010.pdf) | Chapter 10 (x9) |
| [More Number Puzzles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/More%20Number%20Puzzles.pdf) | Sharepoint |
| [Mastering the Basic Math Facts in Multiplication and Division Chapter 11](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%202/Chapter%2011%20Multiplying%20by%208.pdf) | Chapter 11 and 12 (x8 and x7) |
| [Pick a Perfect Product](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Pick%20a%20Perfect.pdf) | Quantiles.com | * I can fluently recall multiplication facts. This means I know from memory all products of two one-digit numbers. * I can fluently multiply using properties and strategies. * I can fluently divide using properties and strategies. | 3.OA.7 |
| [Single Digits Multiplied by Multiples of Ten](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Single%20Digits%20Multiplied%20by%20Multiples%20of%20Ten.pdf) | Quantiles.com | * I can identify strategies to multiply one-digit numbers by multiplies of 10. * I can use place value to multiply one-digit whole numbers by multiples of 10l. | 3.NBT.3 |
| [Multiplying by Multiples of Ten](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/3rd%20Grade/Unit%205/Multiplying%20by%20Multples%20of%20Ten.pdf) | Quantiles.com |

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