

Department of Curriculum & Instruction

Curriculum Guide

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| **Third Grade Mathematics Resources** | | | |
| **Major, Supporting, and Additional Work**   * **Major Work** * Supporting Work * Additional Work   Grade Level Focus   * Represent and solve problems involving multiplication and division. * Understand properties of multiplication and the relationship between multiplication and division. * Multiply and divide within 100. * Solve problems involving the four operations, and identify and explain patterns in arithmetic. * Use place value understanding and properties of operations to perform multi-digit arithmetic. * Develop understanding of fractions as numbers. * Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. * Represent and interpret data. * Geometric measurement: understand concepts of area and relate area to multiplication and to addition. * Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. * Reason with shapes and their attributes. |  | | Fluency Expectations (automaticity)  *\*****Every*** *student should have these skills fully mastered in May.*   * *Fluently add and subtract within 1000* * *Fluently multiply and divide within 100* * *Know from memory all products of two one-digit numbers.*   Problem Solving (with concrete representations)  Students in third grade will focus on understanding the meaning and properties of multiplication and division and on finding products of single-digit multiplying and related quotients. Note that mastering this material may be quite time consuming because there are no general strategies for multiplying or dividing all single-digit numbers, but there are many patterns and strategies dependent upon specific numbers. So it is imperative that extra time and support be provided if needed. |
| **Internet Links** | | | |
| [*Eureka Math Grade Level Modules*](http://greatminds.net/maps/math/module-pdfs)  [*Learn Zillion*](https://learnzillion.com)  [*Illustrative Mathematics*](https://www.illustrativemathematics.org/)  [*K-5 Math Teaching Resources*](http://www.k-5mathteachingresources.com/2nd-grade-number-activities.html)  [*Problem solving tasks*](3rd-Grade-Problem-Solving.pdf) | | [*CPalms (Formative assessments, lessons, parent links, etc.)*](http://www.cpalms.org/Public/search/Standard#0)  [*Tasks, CFA, and more!*](http://www.fwps.org/tfl/math-ccss/3rd-grade-math-ccss/)  [*TNReady Blueprint*](https://www.tn.gov/education/article/tnready-blueprints) | |

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| **Third Grade Mathematics-1st Nine Weeks**  *Topics and Concepts to be covered during the first quarter of the year.* | | |
| ***TN State Standards and Math Practices:***  ***These standards are the final outcomes to reach mastery before the next grade level.***   * **Major Work** * Supporting Work * Additional Work | ***Eureka Content:***  ***Content listed in the section is recommended in order to appropriately teach the identified standards, not only in preparation for the test, but most importantly for success in later courses.*** | ***Assessment:***  ***Both formative and summative assessments should be given to track student learning. The purpose of assessment is to help students identify both areas of strength and areas in which they need more support in order to achieve mastery.*** |
| **Second Grade Foundational Standards**  2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.  2.OA.4 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.  2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s  **Third Grade Standards**   * **3.OA.1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7*** * **3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56* ÷ *8.*** * **3.OA.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.** * **3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For examples, determine the unknown number that makes the equation true in each of the equations 8 x ?= 48, 5 = \_* ÷ *3, 6 x 6 = ?*** * **3.OA.5 Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known (Commutative property of multiplication). 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30 (Associative property of multiplication). Knowing that 8 x 5 = 40 and 8 x 2 =16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56 (Distributive property).*** * **3.OA.6 Understand division as an unknown-factor problem. *For example, find 32* ÷ *8 by finding the number that makes 32 when multiplied by 8.*** * **3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 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.** * **3.OA.8 Solve two-step 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)**   **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  7. Make sense of problems and preserve in solving them. | **Module 1 Properties of Multiplication and Division and Solving Problems with Units of 2-5 and 10**  *Topic A: Multiplication and the Meaning of the Factors (****3.OA.1*** *and 3.OA.3)*  Lesson 1: Understand “equal groups of” as multiplication.  Lesson 2: Relate multiplication to the array model.  Lesson 3: Interpret the meaning of the factors- the size of the group the number of groups.  *Topic B: Division as an Unknown Factor Problem (****3.OA.2, 3.OA.6****, 3.OA.3, 3.OA.4)*  Lesson 4: Understand the meaning of the unknown as the size of the group in division.  Lesson 5: Understand the meaning of the unknown as the number of groups in division.  Lesson 6: Interpret the unknown in division using the array model.  *Topic C: Multiplication Using Units of 2 and 3*  *(****3.OA.1, 3.OA.5****, 3.OA.3, 3.OA.4)*  Lesson 7-8: Demonstrate the commutativity of multiplication, and practice related facts by skip-counting objects in array models.  Lesson 9: Find related multiplication facts by adding and subtracting equal groups in array models  Lesson 10: Model the distributive property with arrays to decompose units as a strategy to multiply  Mid-Module assessment: Topics A-C ( ½ day assessment and ½ day remediation as needed)  *Topic D: Division Using Units of 2 and 3*  *(****3.OA.2, 3.OA.4, 3.OA.6, 3.OA.7****, 3.OA.3, 3.OA.8)*  Lesson 11: Model division as the unknown factor in multiplication using arrays and tape diagrams.  Lesson 12: Interpret the quotient as the number of groups or the number of objects in each group using units of 2.  Lesson 13: Interpret the quotient as the number of groups or the number of objects in each group using units of 3.  *Topic E: Multiplication and Division Using Units of 4 (****3.OA.5, 3.OA.7****, 3.OA.1, 3.OA.2, 3.OA.3, 3.OA.4, 3.OA.6)*  Lesson 14: Skip-count objects in models to build fluency with multiplication facts using units of 4.  (Consider skipping or condensing this lesson)  Lesson 15: Relate arrays to tape diagrams to model the commutative property of multiplication.  Lesson 16: Use the distributive property as a strategy to find related multiplication facts.  Lesson 17: Model the relationship between multiplication and division.  *Topic F: Distributive Property and Problem Solving Using Units of 2-5 and 10 (****3.OA.3, 3.OA.5, 3.OA.7, 3.OA.8****, 3.OA.1, 3.OA.2, 3.OA.4, 3.OA.6)*  Lesson 18-19: Apply the distributive property to decompose units.  Lesson 20: Solve two-step word problems involving multiplication and division, and assess the reasonableness of answers.  Lesson 21: Solve two-step word problems involving all four operations, assess the reasonableness of answers.  End of Module Assessment: Topics A-F  Module 1 will take approximately 5 Weeks  **Vocabulary**: array, commutative property, equal groups, distribute, divide, factors, multiply, number of groups, parentheses, quotient, rotate, row/column, size of groups, unit, unknown  **Math tools**: counters, tape diagram, number bond, array | **Formative (Not Graded):**  Sprints  Core Fluency Checks  Exit Tickets  CFA’s  Amplify Quick Checks (Possible after first quarter)  MICA Practice  [Beginning of the year pre-assessment](http://bridges1.mathlearningcenter.org/files/media/Bridges_GrK-5_Assmnt/GR3-YearlongAssessment-0312w.pdf)  **Summative (Graded):**  Mid-Module assessment: Topics A-C  End-of-Module Assessment: Topics A–F  Common Assessments  **Supplementary Resources for Differentiation**  Extra Practice  [3.OA.1](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa1)  [3.OA.2](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa2)  [3.OA.4](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa4)  [3.OA.5](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa5)  [3.OA.6](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa6)  [3.OA.7](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa7)  [3.OA.8](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3oa8)  [TNCore](http://www.tncore.org/math/instructional_resources.aspx) (Includes 9 instructional tasks and 2 task arcs)  Books to consider:  Multiplication- Amanda Bean’s Amazing Dream, Six Dinner Sid, One Grain of Rice, The King’s Chessboard  Division- One Hundred Hungry Ants, The Great Divide, Divide and Ride, The Doorbell Rang, A Remainder of One, Bean Thirteen  (\*Note: these books may be found at local libraries or even as YouTube video in some cases)  Number Talks: Incorporate on a regular basis with a focus on multiplication strategies (repeated addition/skip counting, making friendly numbers, partial products, doubling and halving, breaking factors apart) and division strategies (repeated subtraction, dealing out, multiplying up, partial quotients, proportional reasoning)  Reinforcement  [Mr. Nussbaum](http://mrnussbaum.com/library/) (remediation practice grouped by addition/subtraction/multiplication/division and broken into standards)  [3.OA.3](http://www.ilteachandtalk.org/#!3oa3/c1gn)  [3.OA.5](http://www.ilteachandtalk.org/#!3oa5/cl0u)  [3.OA.7](http://www.ilteachandtalk.org/#!3oa7/c1u2s)  Enrichment  [Cookie Dough Task](http://www.achieve.org/files/NYCDOEG3MathCookieDough_Final.SW_.pdf) (Includes several tasks and printable matching games for multiplication)  [CK-12](https://braingenie.ck12.org/standards/456) (Review practice questions)  [Array City Project](http://eisforexplore.blogspot.com.au/2013/02/array-city.html) (students use arrays to create an art project) |
| **Second Grade Foundational Standards**  2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.  2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.  2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.  **Third Grade Standards**   * 3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100. * 3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value properties of operations, and/or the relationship between addition and subtraction. * **3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.** * **3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as beaker with a measurement scale) to represent the problem.**   **Mathematical Practices**  2. Reason abstractly and quantitatively.  4. Model with mathematics.  6. Attend to precision.  7. Make sense of problems and preserve in solving them. | **Module 2 Place Value and Problem Solving Units of Measure**  *Topic A: Time Measurement and Problem Solving (****3.NBT.2 and 3.MD.1****)*  Lesson 1: Explore time as a continuous measurement using a stopwatch. *(Lesson 1 may be omitted, make sure to time activities using a stopwatch prior to Lesson 2)*  Lesson 2: Relate skip-counting by fives on the clock and telling time to a continuous measurement model, the number line.  Lesson 3: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.  Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock. *(Lesson 4 may be omitted, it is the first of two consecutive problem solving lessons involving time. Consider embedding some of the word problems from this lesson into Lesson 5)*  Lesson 5: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.  *Topic B: Measuring Weight and Liquid Volume in Metric Units (****3.NBT.2 and 3.MD.2****)*  Lesson 6: Build and decompose a kilogram to reason about the size and weight of 1 kilogram, 100 grams, 10 grams, and 1 gram.  Lesson 7: Develop estimation strategies by reasoning about the weight in kilograms of a series of familiar objects to establish mental benchmark measures.  Lesson 8: Solve one-step word problems involving metric weights within 100 and estimate to reason about solutions.  Lesson 9: Decompose a liter to reason about the size of 1 liter, 100 milliliters, 10 milliliters, and 1 milliliter.  Lesson 10: Estimate and measure liquid volume in liters and milliliters using the vertical number line.  Lesson 11: Solve mixed word problems involving all four operations with grams, kilograms, liters, and milliliters given in the same units.  Mid- Module Assessment: Topics A-B  *Topic C: Rounding to the Nearest Ten and Hundred (****3.NBT.1, 3.MD.1, and 3.MD.2****)*  Lesson 12: Round two-digit measurements to the nearest ten on the vertical number line.  Lesson 13: Round two- and three-digit numbers to the nearest ten on the vertical number line.  Lesson 14: Round to the nearest hundred on the vertical number line.  *Topic D: Two- and Three-digit Measurement Addition Using the Standard Algorithm*  *(****3.NBT.2,*** *3.NBT.1, 3.MB.1, and 3.MD.2)*  Lesson 15: Add measurements using the standard algorithm to compose larger units once. *(Lesson 15 and 16 may be combined.)*  Lesson 16: Add measurements using the standard algorithm to compose larger units twice. *(Lesson 15 and 16 may be combined.)*  Lesson 17: Estimate sums by rounding and apply to solve measurement word problems.  *Topic E: Two- and Three-digit Measurement Subtraction Using the Standard Algorithm (****3.NBT.2,*** *3.NBT.1, 3.MB.1, and 3.MD.2)*  Lesson 18: Decompose once to subtract measurements including three-digit minuends with zeros in the tens or ones place. *(Lessons 18 and 19 may be combined.)*  Lesson 19: Decompose twice to subtract measurements including three-digit minuends with zeros in the tens and ones places. *(Lessons 18 and 19 may be combined.)*  Lesson 20: Estimate differences by rounding and apply to solve measurement word problems. *(Lesson 20 may be omitted, no new skills are presented)*  Lesson 21: Estimate sums and differences of measurements by rounding, and then solve mixed word problems.  End-of-Module Assessment: Topics A-E  Module 2 will take approximate 4 weeks  *(Note: The actual timeline is set for five weeks, please see pacing guide for omitted and combined lessons to meet the 4 week timeframe.)*  **Vocabulary**: about, addend, capacity, continuous, endpoint, gram, interval, halfway, kilogram, liquid volume, liter, milliliter, plot, point, reasonable, round, second, standard algorithm, and ≈ (symbol).  **Math tools**: beaker, beans, bottles, clocks, containers, cups, cylinder, dropper, liter container, meter stick, pan balance, pitchers, place value cards/chart/disks, plastic baggies, popcorn kernels, rice, ruler, scales, stopwatch, tape diagram, ten-frame, vertical number line, and weights. | **Formative (Not Graded):**  Sprints  Core Fluency Checks  Exit Tickets  CFA’s  Amplify Quick Checks (Possible after first quarter)  MICA Practice  **Summative (Graded):**  Mid-Module assessment: Topics A-B  End-of-Module Assessment: Topics A–E  Common Assessments  **Supplementary Resources for Differentiation**  Extra Practice  [3.NBT.1](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3nbt1)  [3.NBT.2](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3nbt2)  [3.MD.1](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3md1)  [3.MD.2](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=3md2)  [TNCore](http://tncore.org/math/assessment_tasks.aspx) (Select assessment resources- links to fluency practice)  [Task Cards](http://www.k-5mathteachingresources.com/support-files/elapsedtimewordproblems.pdf)  Number Talks: Incorporate on a regular basis with a focus on addition strategies (breaking numbers into place value, friendly numbers, doubles/near doubles, making tens, compensation, adding up in chunks) and subtraction strategies (adding up, counting back, place value, keeping a constant difference, adjusting one number to create an easier problem)  Reinforcement  [Mr. Nussbaum](http://mrnussbaum.com/library/) (Scroll down to the time section)  [Printable time games](http://www.doe.virginia.gov/testing/solsearch/sol/math/3/mess_3-11a.pdf)  [Place Value printable manipulatives](http://www.parents.com/blogs/homeschool-den/2010/01/19/math/first-grade-math-additionplace-value/)  [Rounding games](http://www.mathnook.com/math/skill/roundinggames.php)    Enrichment  [Quia](http://www.quia.com/mc/66516.html) (Matching elapsed time quiz)  [Elapsed time with fractions task](http://www.insidemathematics.org/assets/common-core-math-tasks/time%20to%20get%20clean.pdf)  [Place Value Bubble](https://www.teacherspayteachers.com/Product/Place-Value-Bubble-Map-436435)  [Rounding and Estimating games](https://www.sheppardsoftware.com/mathgames/menus/roundestimate.htm) |
| ***End of Nine Weeks***  ***Module 1***   * Students should be able to interpret products of whole numbers. (3.OA.1; Topics: A, C, E, F) * Students should be able to interpret whole-number quotients as the number of objects in each share or as the number of shares. (3.OA.2; Topics: B, D, E, F) * Students should be able to use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. (3.OA.3 Topics: A, B, C, D, E, F) * Students should determine the unknown whole number in a multiplication or division equation. (3.OA.4; Topics: B, C, D, E, F) * Students should understand and apply the properties of operations as strategies to multiply and divide. (3.OA.5; Topics: C, E, F) * Students should be able to understand division as an unknown-factor problem. (3.OA.6; Topics: B, D, E, F) * Students should be able to fluently multiply and divide within 100 using strategies. (3.OA.7; Topics: D, E, F) * Students should be able to solve two-step word problems using the four operations. Students should represent problems using equations with a letter standing for the unknown. Students should use rounding to assess the reasonableness of answers using the mental computation and estimation strategies including rounding. (3.OA.8; Topics: D, F)   ***Module 2***   * Students should use place value understanding to round whole numbers to the nearest 10 or 100. (3.NBT.1; Topics: C, D, E) * Students should fluently add or subtract within 1000 using strategies and algorithms based on place value, properties of operations, and the relationship between addition and subtraction (3.NBT.2; Topics: A, B, D, E) * Students should acruately tell and write time to the nearest minute and measure time intervals in minutes. Including solving word problems involoving addition and subtraction of time intervals in minutes, by representing the problem on a number line diagram. (3.MD.1; Topics: A, C, D, E) * Students should be able to measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters. Students should acrurately add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units by using drawings (such as beakers). (3.MD.2; Topics: B, C, D, E) | | |

*The material below should be covered within this time frame; specific pacing should be determined in school-based PLC’s.*