



## Grade 3

In grade 3, instructional time will emphasize four areas:

- (1) adding and subtracting multi-digit whole numbers, including using a standard algorithm;
- (2) building an understanding of multiplication and division, the relationship between them and the connection to area of rectangles;
- (3) developing an understanding of fractions and
- (4) extending geometric reasoning to lines and attributes of quadrilaterals.

### Number Sense and Operations

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#### ***MA.3.NSO.1 Understand the place value of four-digit numbers.***

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MA.3.NSO.1.1 Read and write numbers from 0 to 10,000 using standard form, expanded form and word form.  
*Example:* The number two thousand five hundred thirty written in standard form is 2,530 and in expanded form is  $2,000 + 500 + 30$ .

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MA.3.NSO.1.2 Compose and decompose four-digit numbers in multiple ways using thousands, hundreds, tens and ones. Demonstrate each composition or decomposition using objects, drawings and expressions or equations.  
*Example:* The number 5,783 can be expressed as  
 $5 \text{ thousands} + 7 \text{ hundreds} + 8 \text{ tens} + 3 \text{ ones}$  or as  
 $56 \text{ hundreds} + 183 \text{ ones}$ .

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MA.3.NSO.1.3 Plot, order and compare whole numbers up to 10,000.  
*Example:* The numbers 3,475; 4,743 and 4,753 can be arranged in ascending order as 3,475; 4,743 and 4,753.

#### Benchmark Clarifications:

*Clarification 1:* When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the thousands, hundreds, tens and ones digits.

*Clarification 2:* Number lines, scaled by 50s, 100s or 1,000s, must be provided and can be a representation of any range of numbers.

*Clarification 3:* Within this benchmark, the expectation is to use symbols ( $<$ ,  $>$  or  $=$ ).

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MA.3.NSO.1.4 Round whole numbers from 0 to 1,000 to the nearest 10 or 100.  
*Example:* The number 775 is rounded to 780 when rounded to the nearest 10.  
*Example:* The number 745 is rounded to 700 when rounded to the nearest 100.

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***MA.3.NSO.2 Add and subtract multi-digit whole numbers. Build an understanding of multiplication and division operations.***

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MA.3.NSO.2.1 Add and subtract multi-digit whole numbers including using a standard algorithm with procedural fluency.

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MA.3.NSO.2.2 Explore multiplication of two whole numbers with products from 0 to 144, and related division facts.

Benchmark Clarifications:

*Clarification 1:* Instruction includes equal groups, arrays, area models and equations.

*Clarification 2:* Within the benchmark, it is the expectation that one problem can be represented in multiple ways and understanding how the different representations are related to each other.

*Clarification 3:* Factors and divisors are limited to up to 12.

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MA.3.NSO.2.3 Multiply a one-digit whole number by a multiple of 10, up to 90, or a multiple of 100, up to 900, with procedural reliability.

*Example:* The product of 6 and 70 is 420.

*Example:* The product of 6 and 300 is 1,800.

Benchmark Clarifications:

*Clarification 1:* When multiplying one-digit numbers by multiples of 10 or 100, instruction focuses on methods that are based on place value.

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MA.3.NSO.2.4 Multiply two whole numbers from 0 to 12 and divide using related facts with procedural reliability.

*Example:* The product of 5 and 6 is 30.

*Example:* The quotient of 27 and 9 is 3.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably.

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## Fractions

**MA.3.FR.1 Understand fractions as numbers and represent fractions.**

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MA.3.FR.1.1 Represent and interpret unit fractions in the form  $\frac{1}{n}$  as the quantity formed by one part when a whole is partitioned into  $n$  equal parts.

*Example:*  $\frac{1}{4}$  can be represented as  $\frac{1}{4}$  of a pie (parts of a shape), as 1 out of 4 trees (parts of a set) or as  $\frac{1}{4}$  on the number line.

Benchmark Clarifications:

*Clarification 1:* This benchmark emphasizes conceptual understanding through the use of manipulatives or visual models.

*Clarification 2:* Instruction focuses on representing a unit fraction as part of a whole, part of a set, a point on a number line, a visual model or in fractional notation.

*Clarification 3:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.1.2 Represent and interpret fractions, including fractions greater than one, in the form of  $\frac{m}{n}$  as the result of adding the unit fraction  $\frac{1}{n}$  to itself  $m$  times.

*Example:*  $\frac{9}{8}$  can be represented as  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ .

Benchmark Clarifications:

*Clarification 1:* Instruction emphasizes conceptual understanding through the use of manipulatives or visual models, including circle graphs, to represent fractions.

*Clarification 2:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.1.3 Read and write fractions, including fractions greater than one, using standard form, numeral-word form and word form.

*Example:* The fraction  $\frac{4}{3}$  written in word form is four-thirds and in numeral-word form is 4 *thirds*.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on making connections to reading and writing numbers to develop the understanding that fractions are numbers and to support algebraic thinking in later grades.

*Clarification 2:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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**MA.3.FR.2 Order and compare fractions and identify equivalent fractions.**

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MA.3.FR.2.1 Plot, order and compare fractional numbers with the same numerator or the same denominator.

*Example:* The fraction  $\frac{3}{2}$  is to the right of the fraction  $\frac{3}{3}$  on a number line so  $\frac{3}{2}$  is greater than  $\frac{3}{3}$ .

Benchmark Clarifications:

*Clarification 1:* Instruction includes making connections between using a ruler and plotting and ordering fractions on a number line.

*Clarification 2:* When comparing fractions, instruction includes an appropriately scaled number line and using reasoning about their size.

*Clarification 3:* Fractions include fractions greater than one, including mixed numbers, with denominators limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.2.2 Identify equivalent fractions and explain why they are equivalent.

*Example:* The fractions  $\frac{1}{1}$  and  $\frac{3}{3}$  can be identified as equivalent using number lines.

*Example:* The fractions  $\frac{2}{4}$  and  $\frac{2}{6}$  can be identified as not equivalent using a visual model.

Benchmark Clarifications:

*Clarification 1:* Instruction includes identifying equivalent fractions and explaining why they are equivalent using manipulatives, drawings, and number lines.

*Clarification 2:* Within this benchmark, the expectation is not to generate equivalent fractions.

*Clarification 3:* Fractions are limited to fractions less than or equal to one with denominators of 2, 3, 4, 5, 6, 8, 10 and 12. Number lines must be given and scaled appropriately.

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## Algebraic Reasoning

**MA.3.AR.1 Solve multiplication and division problems.**

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- MA.3.AR.1.1 Apply the distributive property to multiply a one-digit number and two-digit number. Apply properties of multiplication to find a product of one-digit whole numbers.

*Example:* The product  $4 \times 72$  can be found by rewriting the expression as  $4 \times (70 + 2)$  and then using the distributive property to obtain  $(4 \times 70) + (4 \times 2)$  which is equivalent to 288.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is to apply the associative and commutative properties of multiplication, the distributive property and name the properties. Refer to [K-12 Glossary \(Appendix C\)](#).

*Clarification 2:* Within the benchmark, the expectation is to utilize parentheses.

*Clarification 3:* Multiplication for products of three or more numbers is limited to factors within 12. Refer to [Properties of Operations, Equality and Inequality \(Appendix D\)](#).

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- MA.3.AR.1.2 Solve one- and two-step real-world problems involving any of four operations with whole numbers.

*Example:* A group of students are playing soccer during lunch. How many students are needed to form four teams with eleven players each and to have two referees?

Benchmark Clarifications:

*Clarification 1:* Instruction includes understanding the context of the problem, as well as the quantities within the problem.

*Clarification 2:* Multiplication is limited to factors within 12 and related division facts. Refer to [Situations Involving Operations with Numbers \(Appendix A\)](#).

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**MA.3.AR.2 Develop an understanding of equality and multiplication and division.**

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- MA.3.AR.2.1 Restate a division problem as a missing factor problem using the relationship between multiplication and division.

*Example:* The equation  $56 \div 7 = ?$  can be restated as  $7 \times ? = 56$  to determine the quotient is 8.

Benchmark Clarifications:

*Clarification 1:* Multiplication is limited to factors within 12 and related division facts.

*Clarification 2:* Within this benchmark, the symbolic representation of the missing factor uses any symbol or a letter.

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MA.3.AR.2.2 Determine and explain whether an equation involving multiplication or division is true or false.

*Example:* Given the equation  $27 \div 3 = 3 \times 3$ , it can be determined to be a true equation by dividing the numbers on the left side of the equal sign and multiplying the numbers on the right of the equal sign to see that both sides are equivalent to 9.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the understanding of the meaning of the equal sign to multiplication and division.

*Clarification 2:* Problem types are limited to an equation with three or four terms. The product or quotient can be on either side of the equal sign.

*Clarification 3:* Multiplication is limited to factors within 12 and related division facts.

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MA.3.AR.2.3 Determine the unknown whole number in a multiplication or division equation, relating three whole numbers, with the unknown in any position.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses any symbol or a letter.

*Clarification 2:* Problems include the unknown on either side of the equal sign.

*Clarification 3:* Multiplication is limited to factors within 12 and related division facts. Refer to [Situations Involving Operations with Numbers \(Appendix A\)](#).

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**MA.3.AR.3 Identify numerical patterns, including multiplicative patterns.**

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MA.3.AR.3.1 Determine and explain whether a whole number from 1 to 1,000 is even or odd.

Benchmark Clarifications:

*Clarification 1:* Instruction includes determining and explaining using place value and recognizing patterns.

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MA.3.AR.3.2 Determine whether a whole number from 1 to 144 is a multiple of a given one-digit number.

Benchmark Clarifications:

*Clarification 1:* Instruction includes determining if a number is a multiple of a given number by using multiplication or division.

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MA.3.AR.3.3 Identify, create and extend numerical patterns.

*Example:* Bailey collects 6 baseball cards every day. This generates the pattern 6, 12, 18, ... How many baseball cards will Bailey have at the end of the sixth day?

Benchmark Clarifications:

*Clarification 1:* The expectation is to use ordinal numbers (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, ...) to describe the position of a number within a sequence.

*Clarification 2:* Problem types include patterns involving addition, subtraction, multiplication or division of whole numbers.

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## Measurement

### **MA.3.M.1 Measure attributes of objects and solve problems involving measurement.**

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MA.3.M.1.1 Select and use appropriate tools to measure the length of an object, the volume of liquid within a beaker and temperature.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on identifying measurement on a linear scale, making the connection to the number line.

*Clarification 2:* When measuring the length, limited to the nearest centimeter and half or quarter inch.

*Clarification 3:* When measuring the temperature, limited to the nearest degree.

*Clarification 4:* When measuring the volume of liquid, limited to nearest milliliter and half or quarter cup.

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MA.3.M.1.2 Solve real-world problems involving any of the four operations with whole-number lengths, masses, weights, temperatures or liquid volumes.

*Example:* Ms. Johnson's class is having a party. Eight students each brought in a 2-liter bottle of soda for the party. How many liters of soda did the class have for the party?

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, it is the expectation that responses include appropriate units.

*Clarification 2:* Problem types are not expected to include measurement conversions.

*Clarification 3:* Instruction includes the comparison of attributes measured in the same units.

*Clarification 4:* Units are limited to yards, feet, inches; meters, centimeters; pounds, ounces; kilograms, grams; degrees Fahrenheit, degrees Celsius; gallons, quarts, pints, cups; and liters, milliliters.

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**MA.3.M.2 Tell and write time and solve problems involving time.**

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MA.3.M.2.1 Using analog and digital clocks tell and write time to the nearest minute using a.m. and p.m. appropriately.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to understand military time.

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MA.3.M.2.2 Solve one- and two-step real-world problems involving elapsed time.

*Example:* A bus picks up Kimberly at 6:45 a.m. and arrives at school at 8:15 a.m. How long was her bus ride?

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to include crossing between a.m. and p.m.

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### Geometric Reasoning

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**MA.3.GR.1 Describe and identify relationships between lines and classify quadrilaterals.**

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MA.3.GR.1.1 Describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines. Identify these in two-dimensional figures.

Benchmark Clarifications:

*Clarification 1:* Instruction includes mathematical and real-world context for identifying points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines.

*Clarification 2:* When working with perpendicular lines, right angles can be called square angles or square corners.

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MA.3.GR.1.2 Identify and draw quadrilaterals based on their defining attributes. Quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids.

Benchmark Clarifications:

*Clarification 1:* Instruction includes a variety of quadrilaterals and a variety of non-examples that lack one or more defining attributes when identifying quadrilaterals.

*Clarification 2:* Quadrilaterals will be filled, outlined or both when identifying.

*Clarification 3:* Drawing representations must be reasonably accurate.

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- MA.3.GR.1.3 Draw line(s) of symmetry in a two-dimensional figure and identify line-symmetric two-dimensional figures.

Benchmark Clarifications:

*Clarification 1:* Instruction develops the understanding that there could be no line of symmetry, exactly one line of symmetry or more than one line of symmetry.

*Clarification 2:* Instruction includes folding paper along a line of symmetry so that both halves match exactly to confirm line-symmetric figures.

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***MA.3.GR.2 Solve problems involving the perimeter and area of rectangles.***

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- MA.3.GR.2.1 Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares.

Benchmark Clarifications:

*Clarification 1:* Instruction emphasizes the conceptual understanding that area is an attribute that can be measured for a two-dimensional figure. The measurement unit for area is the area of a unit square, which is a square with side length of 1 unit.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form (e.g., square centimeter or sq.cm.).

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- MA.3.GR.2.2 Find the area of a rectangle with whole-number side lengths using a visual model and a multiplication formula.

Benchmark Clarifications:

*Clarification 1:* Instruction includes covering the figure with unit squares, a rectangular array or applying a formula.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form.

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- MA.3.GR.2.3 Solve mathematical and real-world problems involving the perimeter and area of rectangles with whole-number side lengths using a visual model and a formula.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to find unknown side lengths.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form.

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- MA.3.GR.2.4 Solve mathematical and real-world problems involving the perimeter and area of composite figures composed of non-overlapping rectangles with whole-number side lengths.

*Example:* A pool is comprised of two non-overlapping rectangles in the shape of an “L”. The area for a cover of the pool can be found by adding the areas of the two non-overlapping rectangles.

Benchmark Clarifications:

*Clarification 1:* Composite figures must be composed of non-overlapping rectangles.

*Clarification 2:* Each rectangle within the composite figure cannot exceed 12 units by 12 units and responses include the appropriate units in word form.

### Data Analysis and Probability

**MA.3.DP.1 Collect, represent and interpret numerical and categorical data.**

- MA.3.DP.1.1 Collect and represent numerical and categorical data with whole-number values using tables, scaled pictographs, scaled bar graphs or line plots. Use appropriate titles, labels and units.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is to complete a representation or construct a representation from a data set.

*Clarification 2:* Instruction includes the connection between multiplication and the number of data points represented by a bar in scaled bar graph or a scaled column in a pictograph.

*Clarification 3:* Data displays are represented both horizontally and vertically.

- MA.3.DP.1.2 Interpret data with whole-number values represented with tables, scaled pictographs, circle graphs, scaled bar graphs or line plots by solving one- and two-step problems.

Benchmark Clarifications:

*Clarification 1:* Problems include the use of data in informal comparisons between two data sets in the same units.

*Clarification 2:* Data displays can be represented both horizontally and vertically.

*Clarification 3:* Circle graphs are limited to showing the total values in each category.