

Grade 4

Strand 1—Number & Operation

(Online MCA, 16–20 items)

(Paper MCA, 18–22 items)

Standard 4.1.1: Demonstrate mastery of multiplication and division basic facts; multiply multi-digit numbers; solve real-world and mathematical problems using arithmetic.

(Online MCA, 6–8 items)

(Paper MCA, 8–10 items)

Benchmarks

4.1.1.1

Demonstrate fluency with multiplication and division facts.

Item Specifications

- Factors are limited to 1–9
 - Vocabulary allowed in items: quotient and vocabulary given at previous grades
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4.1.1.2

Use an understanding of place value to multiply a number by 10, 100 and 1000.

Item Specifications

- Numbers multiplied by 10, 100 and 1000 may contain at most, 2 digits
 - Numbers must be whole numbers
 - Vocabulary allowed in items: vocabulary given at previous grades
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4.1.1.3

Multiply multi-digit numbers using efficient and generalizable procedures based on knowledge of place value, including standard algorithms.

Item Specifications

- Items will contain multiplication of a one- or two-digit number by a two- or three-digit number
 - Numbers must be whole numbers
 - Items must not have context
 - Vocabulary allowed in items: factor and vocabulary given at previous grades
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4.1.1.4

Estimate products and quotients of multi-digit whole numbers by using rounding, benchmarks and place value to assess the reasonableness of results.

Item Specifications

- Assessed within 4.1.1.5

4.1.1.5

Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology and the context of the problem to assess the reasonableness of results.

Item Specifications

- Solutions must be less than 100,000
 - Vocabulary allowed in items: operation, strategy, solve and vocabulary given at previous grades
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4.1.1.6

Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multi-digit whole numbers by one- or two-digit numbers. Strategies may include mental strategies, partial quotients, the commutative, associative and distributive properties and repeated subtraction.

Item Specifications

- Dividend may contain at most, 3 digits
- Vocabulary allowed in items: quotient, divisor, dividend and vocabulary given at previous grades

Standard 4.1.2: Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities.

(Online MCA, 10–12 items)

(Paper MCA, 10–12 items)

Benchmarks

4.1.2.1

Represent equivalent fractions using fraction models such as parts of a set, fraction circles, fraction strips, number lines and other manipulatives. Use the models to determine equivalent fractions.

Item Specifications

- Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12
 - Vocabulary allowed in items: equivalent, represent, numerator, denominator and vocabulary given at previous grades
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4.1.2.2

Locate fractions on a number line. Use models to order and compare whole numbers and fractions, including mixed numbers and improper fractions.

Item Specifications

- Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12
- Vocabulary allowed in items: equivalent, numerator, denominator, improper fraction, mixed numbers, compare and vocabulary given at previous grades

4.1.2.3

Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. Develop a rule for addition and subtraction of fractions with like denominators.

Item Specifications

- Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12
 - Vocabulary allowed in items: numerator, denominator and vocabulary given at previous grades
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4.1.2.4

Read and write decimals with words and symbols; use place value to describe decimals in terms of thousands, hundreds, tens, ones, tenths, hundredths and thousandths.

Item Specifications

- Vocabulary allowed in items: decimal and vocabulary given at previous grades
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4.1.2.5

Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.

Item Specifications

- Numbers used are from thousands to thousandths
 - Allowable symbols: < and >
 - Vocabulary allowed in items: decimal and vocabulary given at previous grades
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4.1.2.6

Read and write tenths and hundredths in decimal and fraction notations using words and symbols; know the fraction and decimal equivalents for halves and fourths.

Item Specifications

- Vocabulary allowed in items: decimal, equivalent and vocabulary given at previous grades
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4.1.2.7

Round decimals to the nearest tenth.

Item Specifications

- Numbers must be less than 500
- Decimals may be given up to thousandths
- Vocabulary allowed in items: decimal and vocabulary given at previous grades

Standard 4.2.1: Use input-output rules, tables and charts to represent patterns and relationships and to solve real-world and mathematical problems.

(Online MCA, 3–4 items)

(Paper MCA, 4–5 items)

Benchmarks

4.2.1.1

Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.

Item Specifications

- When creating a rule from pairs, 3 input-output pairs must be given; pairs are not required to be consecutive
- Output should not exceed 100
- Vocabulary allowed in items: vocabulary given at previous grades

Standard 4.2.2: Use number sentences involving multiplication, division and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences.

(Online MCA, 3–4 items)

(Paper MCA, 4–5 items)

Benchmarks

4.2.2.1

Understand how to interpret number sentences involving multiplication, division and unknowns. Use real-world situations involving multiplication or division to represent number sentences.

Item Specifications

- Numbers must be less than 100
- Variables, boxes or blanks may be used to represent unknown numbers
- Vocabulary allowed in items: variable and vocabulary given at previous grades

4.2.2.2

Use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication and the relationship between multiplication and division to find values for the unknowns that make the number sentences true.

Item Specifications

- Numbers must be less than 100
- Variables, boxes or blanks may be used to represent unknown numbers
- Vocabulary allowed in items: variable and vocabulary given at previous grades

Standard 4.3.1: Name, describe, classify and sketch polygons.

(Online MCA, 3–4 items)

(Paper MCA, 4–5 items)

Benchmarks

4.3.1.1

Describe, classify and sketch triangles, including equilateral, right, obtuse and acute triangles. Recognize triangles in various contexts.

Item Specifications

- Naming of triangles is limited to equilateral, right, obtuse and acute
 - Allowable notation: 90°
 - Vocabulary allowed in items: vertex and vocabulary given at previous grades
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4.3.1.2

Describe, classify and draw quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Recognize quadrilaterals in various contexts.

Item Specifications

- Naming of quadrilaterals is limited to quadrilateral, square, rectangle, trapezoid, rhombus, parallelogram and kite
- Allowable notation: 90°
- Vocabulary allowed in items: vertex, congruent, and vocabulary given at previous grades

Standard 4.3.2: Understand angle and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and areas.

(Online MCA, 4–6 items)

(Paper MCA, 5–7 items)

Benchmarks

4.3.2.1

Measure angles in geometric figures and real-world objects with a protractor or angle ruler.

Item Specifications

- Not assessed on the MCA-III
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4.3.2.2

Compare angles according to size. Classify angles as acute, right and obtuse.

Item Specifications

- Allowable notation: 90° , angle arc
- Vocabulary allowed in items: vocabulary given at previous grades

4.3.2.3

Understand that the area of a two-dimensional figure can be found by counting the total number of same-size square units that cover a shape without gaps or overlaps. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into 1×1 unit squares and viewing these as grouped into rows and columns.

Item Specifications

- Vocabulary allowed in items: area, and vocabulary given at previous grades
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4.3.2.4

Find the areas of geometric figures and real-world objects that can be divided into rectangular shapes. Use square units to label area measurements.

Item Specifications

- Vocabulary allowed in items: area, and vocabulary given at previous grades

Standard 4.3.3: Use translations, reflections and rotations to establish congruency and understand symmetries.

(Online MCA, 3–4 items)

(Paper MCA, 3–4 items)

Benchmarks

4.3.3.1

Apply translations (slides) to figures.

Item Specifications

- Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, transformation, image, and vocabulary given at previous grades
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4.3.3.2

Apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry.

Item Specifications

- Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, vertical, horizontal, transformation, image, and vocabulary given at previous grades
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4.3.3.3

Apply rotations (turns) of 90° clockwise or counterclockwise.

Item Specifications

- Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, clockwise, counterclockwise, transformation, image, and vocabulary given at previous grades

4.3.3.4

Recognize that translations, reflections and rotations preserve congruency and use them to show that 2 figures are congruent.

Item Specifications

- Vocabulary allowed in items: translation, reflection, rotation, symmetry, congruent, transformation, image, and vocabulary given at previous grades

Strand 4—Data Analysis

(Online MCA, 6–7 items)

(Paper MCA, 6-8 items)

Standard 4.4.1: Collect, organize, display and interpret data, including data collected over a period of time and data represented by fractions and decimals.

(Online MCA, 6–7 items)

(Paper MCA, 6–8 items)

Benchmarks

4.4.1.1

Use tables, bar graphs, timelines and Venn diagrams to display data sets. The data may include fractions or decimals. Understand that spreadsheet tables and graphs can be used to display data.

Item Specifications

- Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12
- Decimals are limited to hundredths
- When interpreting data, displays may include tables, bar graphs, timelines, Venn diagrams, line plots and pictographs
- Vocabulary allowed in items: timeline, Venn diagram, survey, and vocabulary given at previous grades