Missouri Mathematics

Grade 5

Adopted 2016

Number Sense and Operations in Base Ten

A. Use place value system understanding to perform operations with multi-digit whole numbers to billions and decimals to thousandths. 5.NBT.A

1. Read, write and identify numbers from billions to thousandths using number names, base ten numerals and expanded form. 5.NBT.A.1
2. Compare two numbers from billions to thousandths using the symbols >, = or <, and justify the solution. 5.NBT.A.2
3. Understand that in a multi-digit number, a digit represents 1/10 times what it would represents in the place to its left. 5.NBT.A.3
4. Evaluate the value of powers of 10 and understand the relationship to the place value system. 5.NBT.A.4
5. Round numbers from billions to thousandths place. 5.NBT.A.5
6. Add and subtract multi-digit whole numbers and decimals to the thousandths place, and justify the solution. 5.NBT.A.6
7. Multiply multi-digit whole numbers and decimals to the hundredths place, and justify the solution. 5.NBT.A.7
8. Divide multi-digit whole numbers and decimals to the hundredths place using up to two-digit divisors and four-digit dividends, and justify the solution. 5.NBT.A.8

Number Sense and Operations in Fractions

A. Understand the relationship between fractions and decimals (denominators that are factors of 100). 5.NF.A

1. Understand that parts of a whole can be expressed as fractions and/or decimals. 5.NF.A.1
2. Convert decimals to fractions and fractions to decimals. 5.NF.A.2
3. Compare and order fractions and/or decimals to the thousandths place using the symbols >, = or <, and justify the solution. 5.NF.A.3

B. Perform operations and solve problems with fractions and decimals. 5.NF.B

4. Estimate results of sums, differences and products with fractions and decimals to the thousandths. 5.NF.B.4

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5. Justify the reasonableness of a product when multiplying with fractions. 5.NF.B.5
   a. Estimate the size of the product based on the size of the two factors. 5.NF.B.5.A
   b. Explain why multiplying a given number by a fraction greater than 1 results in a product larger than the given number. 5.NF.B.5.B
   c. Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. 5.NF.B.5.C
   d. Explain why multiplying the numerator and denominator by the same number is equivalent to multiplying the fraction by 1. 5.NF.B.5.D
6. Solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators, and justify the solution. 5.NF.B.6
7. Extend the concept of multiplication to multiply a fraction or whole number by a fraction. 5.NF.B.7
   a. Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths. 5.NF.B.7.A
   b. Calculate and interpret the product of a fraction by a whole number and a whole number by a fraction. 5.NF.B.7.B
   c. Calculate and interpret the product of two fractions less than one. 5.NF.B.7.C
8. Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations. 5.NF.B.8
   a. Calculate and interpret the quotient of a unit fraction by a non-zero whole number. 5.NF.B.8.A
   b. Calculate and interpret the quotient of a whole number by a unit fraction. 5.NF.B.8.B

Relationships and Algebraic Thinking

A. Represent and analyze patterns and relationships. 5.RA.A

1. Investigate the relationship between two numeric patterns. 5.RA.A.1
   a. Generate two numeric patterns given two rules. 5.RA.A.1.A
   b. Translate two numeric patterns into two sets of ordered pairs. 5.RA.A.1.B
   c. Graph numeric patterns on the Cartesian coordinate plane. 5.RA.A.1.C
   d. Identify the relationship between two numeric patterns. 5.RA.A.1.D
2. Write a rule to describe or explain a given numeric pattern. 5.RA.A.2

B. Write and interpret numerical expressions. 5.RA.B

3. Write, evaluate and interpret numeric expressions using the order of operations. 5.RA.B.3
4. Translate written expressions into algebraic expressions. 5.RA.B.4

Use the four operations to represent and solve problems. 5.RA.C

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5. Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals. 5.RA.C.5

Geometry and Measurement

A. Classify two-and three-dimensional geometric shapes. 5.GM.A

1. Understand that attributes belonging to a category of figures also belong to all subcategories. 5.GM.A.1
2. Classify figures in a hierarchy based on properties. 5.GM.A.2
3. Analyze and describe the properties of prisms and pyramids. 5.GM.A.3

B. Understand and compute volume. 5.GM.B

4. Understand the concept of volume and recognize that volume is measured in cubic units. 5.GM.B.4
   a. Describe a cube with edge length 1 unit as a "unit cube" and is said to have "one cubic unit" of volume and can be used to measure volume. 5.GM.B.4.A
   b. Understand that the volume of a right rectangular prism can be found by stacking multiple layers of the base. 5.GM.B.4.B
5. Apply the formulas V = l × w × h and V = B × h for volume of right rectangular prisms with whole-number edge lengths. 5.GM.B.5

C. Graph points on the Cartesian coordinate plane within the first quadrant to solve problems. 5.GM.C

6. Define a first quadrant Cartesian coordinate system. 5.GM.C.6
   a. Represent the axes as scaled perpendicular number lines that both intersect at 0, the origin. 5.GM.C.6.A
   b. Identify any point on the Cartesian coordinate plane by its ordered pair coordinates. 5.GM.C.6.B
   c. Define the first number in an ordered pair as the horizontal distance from the origin. 5.GM.C.6.C
   d. Define the second number in an ordered pair as the vertical distance from the origin. 5.GM.C.6.D
7. Plot and interpret points in the first quadrant of the Cartesian coordinate plane. 5.GM.C.7

D. Solve problems involving measurement and conversions within a measurement system. 5.GM.D

8. Convert measurements of capacity, length and weight within a given measurement system. 5.GM.D.8
9. Solve multi-step problems that require measurement conversions. 5.GM.D.9

Data and Statistics

A. Represent and analyze data. 5.DS.A

1. Create a line graph to represent a data set, and analyze the data to answer questions and solve problems. 5.DS.A.1

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2. Create a line plot to represent a given or generated data set, and analyze the data to answer questions and solve problems, recognizing the outliers and generating the median. 5.DS.A.2