Montana Math

Grade 5

Operations and Algebraic Thinking MT.5.OA

1. **Use parentheses, brackets, or braces in numerical expressions and evaluate expressions with these symbols using the order of operations.** MT.5.OA.1
2. **Write simple expressions that record calculations with numbers and interpret numerical expressions without evaluating them.** MT.5.OA.2
3. **Generate two numerical patterns using given rules and complete an input-output table for the data, identify apparent relationships between corresponding terms, form ordered pairs from the values in the input-output table, and graph them on a coordinate plane.** MT.5.OA.3

Number and Operations in Base Ten MT.5.NBT

1. **Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.** MT.5.NBT.1
2. **Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10, and use whole-number exponents to denote powers of 10.** MT.5.NBT.2
3. **Read, write, and compare decimals to thousandths by:** MT.5.NBT.3
   a. *Read, write, and compare decimals to thousandths by* reading and writing decimals to thousandths using standard form, word form, and expanded form. MT.5.NBT.3.A
   b. *Read, write, and compare decimals to thousandths by* comparing two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols. MT.5.NBT.3.B
4. **Use place value understandings to round decimals to any place.** MT.5.NBT.4
5. **Accurately and efficiently multiply multi-digit whole numbers using the standard algorithm.** MT.5.NBT.5
6. **Flexibly, accurately, and efficiently find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division and illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.** MT.5.NBT.6

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7 **Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings. This standard should incorporate designs and cultural context relating to Montana Indigenous Peoples and local communities.** MT.5.NBT.7

Number and Operations - Fractions MT.5.NF

1 **Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions.** MT.5.NF.1

2 **Solve problems in context that involve addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, and use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.** MT.5.NF.2

3 **Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b) and solve problems in context that involve division of whole numbers leading to answers in the form of fractions or mixed numbers.** MT.5.NF.3

4 **Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction by:** MT.5.NF.4

- a *Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction by* expressing the product (a/b) × q as "a" parts of a partition of q into b equal parts, equivalently, as the result of a sequence of operations a × q ÷ b. MT.5.NF.4.A
- b *Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction by* finding the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, showing that the area is the same as would be found by multiplying the side lengths, multiplying fractional side lengths to find areas of rectangles, and represent representing fraction products as rectangular areas. MT.5.NF.4.B

5 **Interpret multiplication as scaling (resizing), by:** MT.5.NF.5

- a *Interpret multiplication as scaling (resizing), by* comparing the size of a product to the size of one factor on the basis of the size of the other factor without performing the indicated multiplication. MT.5.NF.5.A
- b *Interpret multiplication as scaling (resizing), by* explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number, and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1. MT.5.NF.5.B

6 **Solve problems in context that involve multiplication of fractions and mixed numbers. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.** MT.5.NF.6

7 **Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions by:** MT.5.NF.7

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a *Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions by* expressing division of a unit fraction by a nonzero whole number and computing such quotients. MT.5.NF.7.A

b *Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions by* expressing division of a whole number by a unit fraction and computing such quotients. MT.5.NF.7.B

c *Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions by:* solve problems in context involving division of unit fractions by nonzero whole numbers and division of whole numbers by unit fractions. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. MT.5.NF.7.C

Measurement and Data MT.5.MD

1 **Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step problems in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.** MT.5.MD.1

2 **Make a line plot to display a data set of measurements in fractions of a unit and use operations on fractions to solve problems involving information presented in line plots.** MT.5.MD.2

3 **Recognize volume as an attribute of solid figures and understand concepts of volume measurement by:** MT.5.MD.3

a *Recognize volume as an attribute of solid figures and understand concepts of volume measurement by* understanding that a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume and can be used to measure volume. MT.5.MD.3.A

b *Recognize volume as an attribute of solid figures and understand concepts of volume measurement by* understanding that a solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. MT.5.MD.3.B

4 **Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.** MT.5.MD.4

5 **Relate volume to the operations of multiplication and addition and volume problems including problems in context by:** MT.5.MD.5

a *Relate volume to the operations of multiplication and addition and volume problems including problems in context by* finding the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and showing that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base and representing the product of three whole numbers using the associative property of multiplication. MT.5.MD.5.A

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b *Relate volume to the operations of multiplication and addition and volume problems including problems in context by* applying the formulas V = l × w × h and V = B × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths including problems in context. MT.5.MD.5.B

c *Relate volume to the operations of multiplication and addition and volume problems including problems in context by* recognizing volume as additive and finding volumes of solid figures composed of two nonoverlapping right rectangular prisms by adding the volumes of the nonoverlapping parts, applying this technique to solve problems in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. MT.5.MD.5.C

Geometry MT.5.G

1 **Use a pair of perpendicular number lines, called axes, to define a coordinate system with the intersection of the lines at the origin arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the x-coordinate, the first number, indicates how far to travel from the origin in the direction of the x-axis and the y-coordinate, the second number, indicates how far to travel in the direction of the y-axis.** MT.5.G.1

2 **Represent problems including problems in context by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. This standard should incorporate designs and cultural context relating to Montana Indigenous Peoples and local communities.** MT.5.G.2

3 **Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.** MT.5.G.3

4 **Classify two-dimensional figures in a hierarchy based on properties.** MT.5.G.4