Wisconsin Mathematics

Grade 5

Adopted 2021

Standards for Mathematical Practice

1. **Make sense of problems and persevere in solving them.** MP.1
2. **Reason abstractly and quantitatively.** MP.2
3. **Construct viable arguments, and appreciate and critique the reasoning of others.** MP.3
4. **Model with mathematics.** MP.4
5. **Use appropriate tools strategically.** MP.5
6. **Attend to precision.** MP.6
7. **Look for and make use of structure.** MP.7
8. **Look for and express regularity in repeated reasoning.** MP.8

Operations and Algebraic Thinking

A. Write and interpret numerical expressions. M.5.OA.A

1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. M.5.OA.A.1
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. M.5.OA.A.2

B. Analyze patterns and relationships. M.5.OA.B

3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. M.5.OA.B.3

Number and Operations in Base Ten

A. Understand the place value system. M.5.NBT.A

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. M.5.NBT.A.1
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. M.5.NBT.A.2

Skip to main content

3. Read, write, and compare decimals to thousandths. M.5.NBT.A.3

    a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000). M.5.NBT.A.3.A

    b. Compare decimals to thousandths based on meanings of the digits in each place and describe the result of the comparison using words and symbols (>, =, and <). M.5.NBT.A.3.B

4. Use place value understanding to generate estimates for problems in real-world situations, with decimals, using strategies such as mental math, benchmark numbers, compatible numbers, and rounding. Assess the reasonableness of their estimates (e.g. Is my estimate too low or too high? What degree of precision do I need for this situation? M.5.NBT.A.4

B. Perform operations with multi-digit whole numbers and with decimals to hundredths. M.5.NBT.B

5. Flexibly and efficiently multiply multi-digit whole numbers using strategies or algorithms based on place value, area models, and the properties of operations. M.5.NBT.B.5

6. 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. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. M.5.NBT.B.6

7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. M.5.NBT.B.7

Measurement and Data

A. Convert like measurement units within a given measurement system. M.5.MD.A

1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. M.5.MD.A.1

B. Represent and interpret data. M.5.MD.B

2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. M.5.MD.B.2

C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. M.5.MD.C

Skip to main content

3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. M.5.MD.C.3

    a. 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. M.5.MD.C.3.A

    b. 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. M.5.MD.C.3.B

4. Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units. M.5.MD.C.4

5. Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. M.5.MD.C.5

    a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show 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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. M.5.MD.C.5.A

    b. Apply the formulas V = l x w x h and V = B x h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real-world and mathematical problems. M.5.MD.C.5.B

    c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems. M.5.MD.C.5.C

Geometry

A. Graph points on the coordinate plane to solve real-world and mathematical problems. M.5.G.A

1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (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 first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). M.5.G.A.1

2. Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. M.5.G.A.2

B. Classify two-dimensional figures into categories based on their properties. M.5.G.B

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

Skip to main content

4. Classify two-dimensional figures in a hierarchy based on properties. M.5.G.B.4

Number and Operations – Fractions

A. Use equivalent fractions as a strategy to add and subtract fractions. M.5.NF.A

1. Add and subtract fractions and mixed numbers using flexible and efficient strategies, including renaming fractions with equivalent fractions. Justify using visual models (e.g., tape diagrams or number lines) and equations. M.5.NF.A.1
2. Solve word problems involving addition and subtraction of fractions referring to the same whole using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. M.5.NF.A.2

B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. M.5.NF.B

3. Interpret a fraction as an equal sharing division situation, where a quantity (the numerator) is divided into equal parts (the denominator). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, by using visual fraction models (e.g., tape diagrams or area models) or equations to represent the problem. M.5.NF.B.3
4. Apply and extend previous understandings of multiplication to multiply a fraction times a whole number (e.g., 2/3 x 4) or a fraction times a fraction (e.g., 2/3 x 4/5), including mixed numbers. M.5.NF.B.4
    a. Represent word problems involving multiplication of fractions using visual models to develop flexible and efficient strategies. M.5.NF.B.4.A
    b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. M.5.NF.B.4.B
5. Interpret multiplication as scaling (resizing) by estimating whether a product will be larger or smaller than a given factor on the basis of the size of the other factor, without performing the indicated multiplication. M.5.NF.B.5
    a. Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. M.5.NF.B.5.A
    b. Relate the principle of fraction equivalence to the effect of multiplying or dividing a fraction by 1 or an equivalent form of 1 (e.g., 3/3, 5/5). M.5.NF.B.5.B
6. Solve real-world problems involving multiplication of fractions and mixed numbers by using visual fraction models (e.g., tape diagrams, area models, or number lines) and equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. M.5.NF.B.6

Skip to main content

7. Apply and extend previous understandings of division to divide unit fractions by whole numbers (e.g., 1/3 ÷ 4) and whole numbers by unit fractions (e.g., 4 ÷ 1/5). Students able to multiply fractions can develop strategies to divide fractions by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade. M.5.NF.B.7

    a. Interpret and represent division of a unit fraction by a non-zero whole number as an equal sharing division situation. M.5.NF.B.7.A

    b. Interpret and represent division of a whole number by a unit fraction as a measurement division situation. M.5.NF.B.7.B

    c. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions by using visual fraction models and equations to represent the problem. M.5.NF.B.7.C