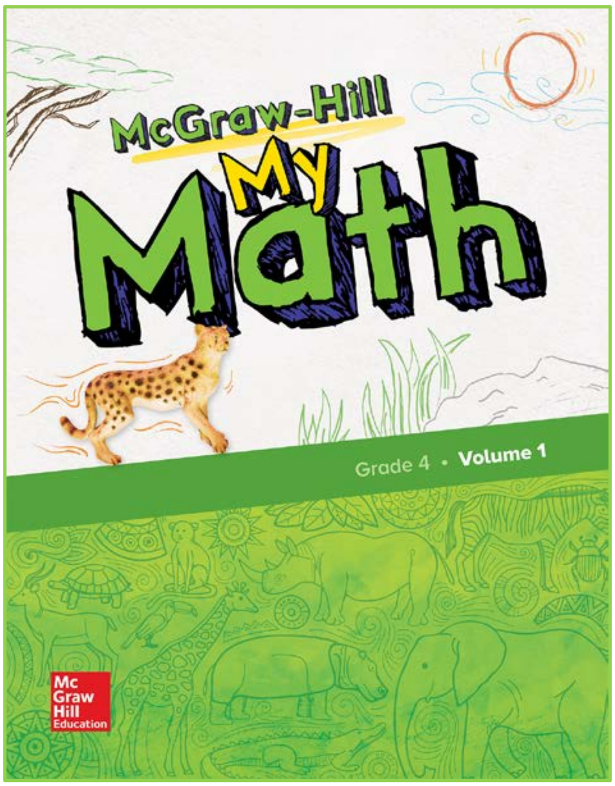
Ohio's Learning Standards
Grade 4



McGraw-Hill My Math

Volumes 1 and 2

Grade 4

STANDARDS	PAGE REFERENCES
Operations and Algebraic Thinking **Use the four operations with whole numbers to solve problems.**	
4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	147–152

STANDARDS	PAGE REFERENCES
4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. See Table 2, page 96. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)	147–152, 153–158, 179–184
4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	87–92, 93–98, 113–118, 241–246, 305–310, 393–398, 451–456, 465–470
Gain familiarity with factors and multiples.	
4.OA.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	173–178, 197–202, 329–334, 485–490, 491–496
Generate and analyze patterns.	
4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	67–72, 413–418, 419–424, 425–430, 431–436, 439–444, 445–450, 459–464, 465–470
Numbers and Operations in Base Ten **Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000.**	
4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right by applying concepts of place value, multiplication, or division.	11–16, 197–202, 329–334

STANDARDS	PAGE REFERENCES
4.NBT.2 Read and write multi-digit whole numbers using standard form, word form, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	17–22, 23–28, 29–34, 43–48
4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place through 1,000,000.	37–42, 43–48, 79–84, 203–208, 255–260, 285–290, 335–340
Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.	
4.NBT.4 Fluently[G] add and subtract multi-digit whole numbers using a standard algorithm[G].	61–66, 67–72, 73–78, 79–84, 87–92, 93–98, 99–104, 107–112, 113–118, 305–310
4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	135–140, 161–166, 167–172, 197–202, 203–208, 209–214, 215–220, 223–228, 229–234, 235–240, 241–246, 247–252, 255–260, 261–266, 279–284, 285–290, 293–298, 299–304, 305–310, 311–316
4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-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.	135–140, 141–146, 329–334, 335–340, 341–346, 347–352, 353–358, 359–364, 367–372, 373–378, 379–384, 387–392
Numbers and Operations--Fractions **Extend understanding of fraction equivalence and ordering limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**	
4.NF.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	499–504, 505–510, 511–516

STANDARDS	PAGE REFERENCES
4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	517–522, 523–528, 531–536
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. (Fractions need not be simplified.)	
4.NF.3 Understand a fraction *a/b* with *a* > 1 as a sum of fractions 1/*b*.	537–542, 543–548, 561–566, 567–572, 573–578, 579–584, 587–592, 593–598, 599–604
a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	561–566, 567–572, 573–578, 579–584
b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*	537–542, 561–566, 567–572, 593–598, 599–604
c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	587–592, 593–598, 599–604
d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	561–566, 567–572, 573–578, 579–584, 587–592, 593–598, 599–604
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100 (Fractions need not be simplified).	
4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	607–612, 613–618
a. Understand a fraction *a/b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4), or 5/4 = 1/4 + 1/4 + 1/4 + 1/4 + 1/4.*	607–612, 613–618

STANDARDS	PAGE REFERENCES
b. Understand a multiple of *a/b* as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*	607–612, 613–618
c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	607–612, 613–618
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	
4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* In general, students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators, but addition and subtraction with unlike denominators is not a requirement at this grade.	505–510, 651–656, 657–662, 663–668, 675–680
4.NF.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*	631–636, 637–642, 643–648, 651–656, 657–662, 663–668, 669–674, 675–680
4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	631–636, 669–674

STANDARDS	PAGE REFERENCES
Measurement and Data **Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**	
4.MD.1 Know relative sizes of the metric measurement units within one system of units. Metric units include kilometer, meter, centimeter, and millimeter; kilogram and gram; and liter and milliliter. Express a larger measurement unit in terms of a smaller unit. Record measurement conversions in a two-column table. *For example, express the length of a 4-meter rope in centimeters. Because 1 meter is 100 times as long as a 1 centimeter, a two-column table of meters and centimeters includes the number pairs 1 and 100, 2 and 200, 3 and 300,...*	775–780, 781–786, 787–792, 801–806, 807–812
4.MD.2 Solve real-world problems involving money, time, and metric measurement. **a.** Using models, add and subtract money and express the answer in decimal notation.	697–702, 703–708, 709–714, 715–720, 723–728, 729–734, 735–740, 749–754, 755–760, 795–800, 801–806, 807–812
b. Using number line diagrams, clocks, or other models, add and subtract intervals of time in hours and minutes.	735-740
c. Add, subtract, and multiply whole numbers to solve metric measurement problems involving distances, liquid volumes, and masses of objects.	797-798, 800, 807-812
4.MD.3 Develop efficient strategies to determine the area and perimeter of rectangles in real-world situations and mathematical problems. *For example, given the total area and one side length of a rectangle, solve for the unknown factor, and given two adjacent side lengths of a rectangle, find the perimeter.*	825–830, 831–836, 839–844, 845–850, 851–856
Represent and interpret data.	
4.MD.4 Display and interpret data in graphs (picture graphs, bar graphs, and line plots) to solve problems using numbers and operations for this grade.	743–748

STANDARDS	PAGE REFERENCES
Geometric measurement: understand concepts of angle and measure angles.	
4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	887–892, 893–898, 899–904
a. Understand an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.	887–892, 893–898
b. Understand an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	893–898
4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	899–904, 905–910
4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	911–916
Geometry **Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**	
4.G.1 Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	873–878, 879–884, 887–892, 893–898, 899–904, 905–910, 911–916, 919–924, 925–930, 937–942
4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.	919–924, 925–930, 937–942