

**CURRENT RESOURCES THAT SUPPORT TEACHING AND LEARNING OF THE
COMMON CORE STATE STANDARDS IN MATHEMATICS**

GRADE 5

Operations & Algebraic Thinking	
Write and interpret numerical expressions.	Instructional Resources
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	HM Ch. 2 L 2-7 Pg. 66-68
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.</i>	HM Ch. 2 L 2-8 Pg. 70-72 HM Ch. 2 L 2-9 Pg. 74-75
Analyze patterns and relationships.	
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. <i>For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i>	HM Ch. 2 L 2-10 Pg. 76-77

Number & Operations in Base Ten	
Understand the place value system.	Instructional Resources
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.	HM Ch 1 L1 Pg. 4-5 HM Ch 1 L2 Pg. 6-7 HM Ch 1 L 5 Pg. 14-16 HM Ch 1 L 8 Pg 24-25 (Decimal)
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.	HM Ch 3 L6 pg. 106-108 HM Ch 3 L 6 Pg 110-111 HM Ch 4 L6 Pg 146-147 HM Ch 9 L6 Pg. 420 - 421 (Decimal) I-Building on the Numbers You Know I4 “How Many Dots on a Page” Pg. 108-109 I-Building on the Numbers You Know I4 “Rectangles with 10,000 Dots” Pg. 109-110 I-Building on the Numbers You Know I3 “How Many Dots in All?” Pg. 111-112

<p>3. Read, write, and compare decimals to thousandths.</p> <p>a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.</p> <p>b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p>	<p>HM Ch 1 L8 Pg. 24-25 (Reading/ Writing in standard and word form) HM Ch 1 L9 Pg. 26-27 (Comparing) HM Ch 1 L11 Pg. 30-31 (Comparing)</p>
<p>4. Use place value understanding to round decimals to any place.</p>	<p>HM Ch 1 L10 Pg. 28-29</p>
<p>Perform operations with multi-digit whole numbers and with decimals to hundredths.</p>	<p>Instructional Resources</p>
<p>5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<p>HM Ch 3 L2 Pg. 98-99 (One-Digit) HM Ch 3 L3 Pg. 100-101 (Multiplying with Zeros) HM Ch 3 L8 Pg. 114-115 (Two-Digit)</p> <p>I-Building on the Numbers You Know I5-6 “Multiplying with Cartons of Milk” Pg. 61-62 I-Building on the Numbers You Know I5-6 “Writing a Multiplication Situation” Pg. 63 I-Building on the Numbers You Know I5-6 “Writing a Multiplication Situation” Pg. 63 I-Building on the Numbers You Know I3 “Making Close Multiplication Estimates” Pg. 75 I-Building on the Numbers You Know I3 “Reasoning About Estimates” Pg. 76 I-Building on the Numbers You Know I3 “Multiplication Clusters” Pg. 77-80</p>
<p>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.</p>	<p>HM Ch 4 L1 Pg. 134-135 (One-Digit Divisors) HM Ch 4 L2 Pg. 136-137 (Zeros in Quotient) HM Ch 4 L6 Pg. 146-147 (Dividing by multiples of 10) HM Ch 4 L6 Pg. 148-149 (Two-Digit Divisors) HM Ch 4 L8 Pg. 150-151 (Estimating Quotients) HM Ch 4 L9 Pg. 152-153 (Estimating Quotients) HM Ch 4 L10 Pg. 154-156 (Four/Five-Digit Dividends)</p> <p>I-Building on the Numbers You Know I2 “The Ringle” Pg. 42-44 I-Building on the Numbers You Know I2 “Boxes of Markers” Pg. 44-46 I-Building on the Numbers You Know I2 “Division Situations” Pg. 57-60</p>

	<p>I-Building on the Numbers You Know I2 “Dividing with Cartons of Milk” Pg. 62-63 I-Building on the Numbers You Know I2 “Writing a Related Division Situation” Pg. 64 I-Building on the Numbers You Know I3 “Making Close Division Estimates” Pg. 83-84 I-Building on the Numbers You Know I3 “Reasoning About Division Estimates” Pg. 84-87</p> <p>I-Building on the Numbers You Know I3 “Solving Division Clusters” Pg. 88</p>
<p>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.</p>	<p>HM Ch 2 L4 Pg 58-59 (Addition) HM Ch 2 L5 Pg. 60-61 (Subtraction) HM Ch 9 L1 Pg. 408-409 (Multiplication) HM Ch 9 L2 Pg. 410-411 (Estimating Products) HM Ch 9 L3 Pg. 412-413 (Multiplication) HM Ch 9 L4 Pg. 414-415 (Multiplication) HM Ch 9 L7 Pg. 422-423 (Division) HM Ch 9 L9 Pg. 426-427 (Division) HM Ch 9 L10 Pg. 428-429 (Division) HM Ch 9 L11 Pg 432-434 (Division)</p>

Number & Operations—Fractions	
<p>Use equivalent fractions as a strategy to add and subtract fractions.</p>	<p>HM Ch. 7 L 4 Pg. 304-306 (Greatest Common Factor) HM Ch. 7 L 5 Pg. 348-310 (Least Common Multiple) HM Ch. 7 L 8 Pg. 318-319 (Equivalent Fractions)</p> <p>I-Name That Portion I2 “Halfway Across the Fraction Tracks” Pg. 46-47 I-Name That Portion I2 “Labeling the Fraction Tracks” Pg. 47 I-Name That Portion I2 “Patterns on the Fraction Tracks” Pg. 47-48 I-Name That Portion I2 “Counting by Fractions” Pg. 49-50 I-Name That Portion I2 “Dialogue Box” Pg. 52</p>

	I-Name That Portion I2 “The Fraction Track Game” Pg. 53-61 (Assorted games to practice and reinforce basic fraction skills)
1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)</i>	HM Ch. 7 L 14 Pg. 332-333 (Addition) HM Ch. 7 L 15 Pg. 334-335 (Addition) HM Ch. 7 L 16 Pg. 336-338 (Addition) HM Ch. 7 L 17 Pg. 340-342 (Subtraction) HM Ch. 7 L 18 Pg. 344-345 (Subtraction) HM Ch. 7 L 19 Pg. 346-347 (Subtraction) I-Name That Portion I2 “Clock Fractions” Pg. 34-36 I-Name That Portion I2 “Adding Fractions on the Clock” Pg. 36-37 I-Name That Portion I2 “Roll Around the Clock Game” Pg. 38-40 I-Name That Portion I2 “Marking Fraction Strips” Pg. 42-43 I-Name That Portion I2 “Using the Strips for Fraction Sums” Pg. 44-45
2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by 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. <i>For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.</i>	HM Ch. 7 L 20 Pg. 348-349 (Related topic) I-Name That Portion I2 “Writing Fraction Problems” Pg. 40 I Data: Kid, Cats, and Ads (Various activities in this book include “real world” problem solving that include fraction work while others could be adapted.)
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Instructional Resources
3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <i>For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</i>	HM Ch. 7 L 7 Pg. 316-317 (Teaches concept of fraction as division)

<p>4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</p> <p>a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. <i>For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)</i></p> <p>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.</p>	<p>HM Ch. 8 L 1 Pg. 366-367 (Model Multiplication) HM Ch. 8 L 2 Pg. 368-370 (Multiply Fractions) HM Ch. 8 L 3 Pg. 372-33 (Multiply Fraction and Mixed Numbers)</p>
<p>5. Interpret multiplication as scaling (resizing), by:</p> <p>a. 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.</p> <p>b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); 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 $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.</p>	<p>HM Ch. 11 L 4 Pg. 524-525 (Scale Drawing)</p>
<p>6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p>	<p>HM Ch. 8 L 4 Pg. 374-375 (Related Word Problems)</p>
<p>7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.¹</p> <p>a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. <i>For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.</i></p> <p>b. Interpret division of a whole number by a unit fraction, and compute such quotients. <i>For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.</i></p> <p>c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$-cup servings are in 2 cups of raisins?</i></p>	<p>HM Ch. 8 L 5 Pg. 378-379 (Division Unit Fraction) HM Ch. 8 L 6 Pg. 380-381 (Divide by a Counting Number) HM Ch. 8 L 8 Pg. 384-385 (Divide by a Fraction)¹ HM Ch. 8 L 9 Pg. 386-388 (Divide with Mixed Numbers)¹</p> <p>HM Ch. 8 L 7 Pg. 382-383 (Related Division Word Problems) HM Ch. 8 L 10 Pg. 390-391 (Related Division Word Problems)</p>

¹ Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

Measurement & Data	
<p>Convert like measurement units within a given measurement system.</p>	<p>HM Ch 5 L1 Pg 192-193 (Standard) HM Ch 5 L5 Pg 202-204 (Metric)</p> <p>I-Measurement Benchmarks I1 “Exploring Measurement” Pg 4-11 I-Measurement Benchmarks I1 “Using Measuring Tools” Pg 19-23</p>
<p>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.</p>	<p>HM Ch 5 L2 Pg 194-196 (Standard Measure) HM Ch 5 L3 Pg 198-199 (Standard Weight and Capacity) HM Ch 5 L5 Pg 202-204 (Metric Measure) HM Ch 5 L6 Pg 206-207 (Metric Mass and Capacity) HM Ch 5 L7 Pg 208-209 (Time) HM Ch5 L7 Pg Pg 210-211 (Time Problem Solving)</p>
Represent and interpret data.	Instructional Resources
<p>2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. <i>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</i></p>	<p>HM Ch 6 L6 g 260-61</p> <p>I- Measurement Benchmarks I2 “Same or Different Weights?” Pg 63-65</p>
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Instructional Resources

<p>3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p>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.</p> <p>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.</p>	<p>HM Ch 10 L16 Pg 494-497</p> <p>I--Measurement Benchmarks I2 “Measurements on Grocery Labels” Pg 47-48</p> <p>I- Measurement Benchmarks I2 “A Closer Look at Liquid Measures” Pg 49-50</p> <p>I-Measurement Benchmarks I2 “Working with Units of Liquid Volume” Pg 58-61</p>
<p>4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p>	<p>HM Ch 10 L18 Pg 500-501</p> <p>I-Containers and Cubes I4 “Using Standard Volume Units” Pg 74-78</p> <p>I-Measurement Benchmarks I2 “Working with Units of Liquid Volume” Pg 58-61</p> <p>I-Containers and Cubes I1 “How Many Cubes?” Pg 4-14</p>
<p>5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>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.</p> <p>b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ 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.</p> <p>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.</p>	<p>HM Ch 10 L17 Pg 498-499</p> <p>I-Containers and Cubes I1 “How We Give Dimensions” Pg 17-18</p> <p>I-Containers and Cubes I1 “How Many Packages?” Pg 26-30</p> <p>I-Containers and Cubes I3 “Measuring the Space i a Box” Pg 40-49</p> <p>I-Containers and Cubes I3 “The Space Inside Our Classroom” Pg 50-57</p>

Geometry	
Graph points on the coordinate plane to solve real-world and mathematical problems.	Instructional Resources
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).	HM Ch. 12 L2 Pg. 574 - 576 HM Ch. 12 L7 Pg. 588-589 I Picturing Polygons I 1 “Finding the Coordinates” Pg. 15-16
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.	HM Ch. 12 L4 Pg. 580-581 HM Ch. 12 L8 Pg. 590-591
Classify two-dimensional figures into categories based on their properties.	HM Ch. 10 L1 Pg. 454-455 HM Ch. 10 L2 Pg. 456-459
3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	HM Ch.10 L3 Pg. 460-461 (Triangles) HM Ch. 10 L4 Pg. 462-463 (Congruence) HM Ch. 10 L5 Pg. 464-465 (Quadrilaterals) HM Ch. 10 L7 Pg. 470-471 (Circles and Angles) I <u>Picturing Polygons</u> I 1 “Picking Out Polygons” pg. 5-6 I <u>Picturing Polygons</u> I 1 “Defining a Polygon” Pg. 6 I <u>Picturing Polygons</u> I 1 “Polygon Art” Pg. 7 I <u>Picturing Polygons</u> I 1 “Putting Together Power Polygons” Pg. 10-12 I <u>Picturing Polygons</u> I 1 “Polygon Pictures” page 13 I Picturing Polygons I 3 “Regular Polygons and Similarity” Pg 80-89
4. Classify two-dimensional figures in a hierarchy based on properties.	I Picturing Polygons I 2 “Identifying Triangles by Their Angles” Pg 32-33 I Picturing Polygons I 2 “Sorting Triangles” Pg 34 I Picturing Polygons I 2 “All Triangles, Some Triangles” Pg 35-36 I Picturing Polygons I 2 “Identifying Quadrilaterals” Pg 36-37 I Picturing Polygons I 2 “Sorting Quadrilaterals” Pg 37 I Picturing Polygons I 2 “Attributes of Quadrilaterals” Pg 38-39 I Picturing Polygons I 2 “Playing Guess My Rule” Pg 29-40 I Picturing Polygons I 2 “Classification of Triangles and Quadrilaterals” Pg 42-43

	I Picturing Polygons I 2 “Following the Rules” Pg 47 I Picturing Polygons I 2 “Can You Make These?” Pg 48-49 I Picturing Polygons I 3 “Regular Polygons and Similarity” Pg 80-89
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