CORE® Math Services Align with the Common Core State Standards Mathematics (K–6)

CORE Elementary Math Academy Alignment with Common Core State Standards

CORE Elementary Math Academy emphasizes throughout each day the importance of teaching along the five proficiency strands identified by the National Research Council in *Adding It Up* (2001):

- Conceptual understanding
- Strategic competence
- Adaptive reasoning
- Productive disposition
- Procedural fluency

These correspond to the eight mathematical practices emphasized in the Common Core State Standards for all grade levels, as follows:

1. Make sense of problems and persevere in solving them. *(Procedural fluency)*
2. Reason abstractly and quantitatively. *(Adaptive reasoning)*
3. Construct viable arguments and critique the reasoning of others. *(Adaptive reasoning)*
4. Model with mathematics. *(Conceptual understanding and strategic competence)*
5. Use appropriate tools strategically. *(Strategic competence)*
6. Attend to precision. *(Procedural fluency)*
7. Look for and make use of structure. *(Conceptual understanding and strategic competence)*
8. Look for and express regularity in repeated reasoning. *(Conceptual understanding, strategic competence, and procedural fluency)*

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Number and Operations in Base Ten	**Understand place value**	• Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones. • Recognize that in a multidigit 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. • Count within 1000; skip-count by 5s, 10s, and 100s. • Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. • Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. • Read, write, and compare decimals to thousandths. • Explain why addition and subtraction strategies work, using place value and the properties of operations.	**CORE Math Academy for Elementary Schools, Sessions 1 and 2** Numbers and Operations Place Value and Multidigit Operations

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Number and Operations in Base Ten (cont.)	**Use place value understanding to perform multidigit arithmetic**	• Understand counting and cardinality. • Extend the counting sequence. • Add and subtract within 100. • Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count. Explain the reasoning used. • Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), 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. • Fluently add and subtract multidigit whole numbers using the standard algorithm. • Fluently multiply multidigit whole numbers using the standard algorithm. • Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. • Add, subtract, multiply, and divide decimals to hundredths.	**CORE Math Academy for Elementary Schools, Sessions 1 and 2** Numbers and Operations Place Value and Multidigit Operations

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Operations and Algebraic Thinking	**Represent and solve problems involving using the four operations with whole numbers**	• Use addition and subtraction within 20 to solve word problems. • Interpret products and quotients of whole numbers. • Use multiplication and division within 100 to solve word problems. • Determine the unknown whole number in a multiplication or division equation. • Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. • Multiply or divide to solve word problems involving multiplicative comparison. • 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.	**CORE Math Academy for Elementary Schools, Sessions 1, 2, and 4** Numbers and Operations Place Value and Multidigit Operations Multiplicative Thinking and Equivalence

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Operations and Algebraic Thinking (cont.)	**Understand and apply properties of operations and relationship between addition and subtraction, and multiplication and division**	• Apply properties of operations as strategies to add and subtract. • Understand subtraction as an unknown-addend problem. • Apply properties of operations as strategies to multiply and divide. • Understand division as an unknown-factor problem.	**CORE Math Academy for Elementary Schools, Sessions 1, 2, and 4** Numbers and Operations Place Value and Multidigit Operations Multiplicative Thinking and Equivalence
	Add and subtract within 20; multiply and divide within 100	• Relate counting to addition and subtraction. • Fluently add and subtract within 20 using mental strategies. • Fluently multiply and divide within 100. • Find all factor pairs for a whole number in the range 1–100.	
	Identify, explain, generate, and analyze patterns	• Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. • 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.	**CORE Math Academy for Elementary Schools, Session 4** Multiplicative Thinking and Equivalence

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Operations and Algebraic Thinking (cont.)	**Write and interpret numerical expressions and solve equations**	• Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. • Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. • Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. • Solve two-step word problems using the four operations. 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.	**CORE Math Academy for Elementary Schools, Session 4** Multiplicative Thinking and Equivalence
Number and Operations: Fractions	**Develop understanding of fractions as numbers**	• Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. • Understand a fraction as a number on the number line; represent fractions on a number line diagram. • Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	**CORE Math Academy for Elementary Schools, Session 3** Fractions

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Number and Operations: Fractions (cont.)	**Extend understanding of fraction equivalence and ordering**	• Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models. • 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.	**CORE Math Academy for Elementary Schools, Session 3** Fractions
	Understand decimal notation for fractions, and compare decimal fractions	• 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. • Use decimal notation for fractions with denominators 10 or 100. • Compare two decimals to hundredths by reasoning about their size.	**CORE Math Academy for Elementary Schools, Sessions 3 and 4** Fractions Multiplicative Thinking and Equivalence
	Use equivalent fractions as a strategy to add and subtract fractions	• Add and subtract fractions with unlike denominators. • Solve word problems involving addition and subtraction of fractions referring to the same whole. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.	**CORE Math Academy for Elementary Schools, Session 3** Fractions

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Number and Operations: Fractions (cont.)	**Apply and extend previous understandings of operations with whole numbers to operations with fractions**	• Develop understanding of fractions as numbers. • Extend understanding of fraction equivalence and ordering. • Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. • Understand a fraction a/b with a > 1 as a sum of fractions 1/b. • Use equivalent fractions as a strategy to add and subtract fractions. • Interpret a fraction as division of the numerator by the denominator. • Apply and extend previous understandings of multiplication to multiply fractions. • Interpret multiplication as scaling. • Solve real-world problems involving multiplication of fractions and mixed numbers. • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	**CORE Math Academy for Elementary Schools, Session 3** Fractions

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Measurement and Data	**Measure and estimate lengths indirectly and in standard units, and relate addition and subtraction to length**	• Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. • Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. • Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	**CORE Math Academy for Elementary Schools, Sessions 1 and 5** Numbers and Operations Geometry and Measurement
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit	• Know relative sizes of measurement units within one system of units. • Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.	**CORE Math Academy for Elementary Schools, Sessions 5** Geometry and Measurement

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Measurement and Data (cont.)	**Geometric measurement: Understand concepts of area and volume and relate these concepts to multiplication and to addition**	• Recognize area as an attribute of plane figures and understand concepts of area measurement. • Measure areas by counting unit squares. • Relate area to the operations of multiplication and addition. • Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. • Recognize volume as an attribute of solid figures and understand concepts of volume measurement. • Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. • Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.	**CORE Math Academy for Elementary Schools, Session 5** Geometry and Measurement

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Measurement and Data (cont.)	**Geometric measurement: understand concepts of angle and measure angles**	• Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. • Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	**CORE Math Academy for Elementary Schools, Session 5** Geometry and Measurement

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Geometry	**Classify two-dimensional figures into categories based on their properties**	• Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*. • Correctly name shapes regardless of their orientations or overall size. Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc.; and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. • Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. • 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. Recognize right triangles as a category, and identify right triangles. • Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. • Classify two-dimensional figures in a hierarchy based on properties.	**CORE Math Academy for Elementary Schools, Sessions 3 and 5** Fractions Geometry and Measurement

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Common Core Strand	Focus Area	Standards	Corresponding CORE Service
Geometry	**Reason with shapes and their attributes**	• Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. • Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. • Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	**Elementary Schools – Session 5** Geometry and Measurement