MATHEMATICS: GRADE 4

In Grade 4, instructional time should focus on three critical areas: 1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; 2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; 3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

1. Developing Understanding and Fluency with Multi-Digit Multiplication, and Developing Understanding of Dividing to Find Quotients Involving Multi-Digit Dividends

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

2. Developing an Understanding of Fraction Equivalence, Addition, Subtraction of Fractions with Like Denominators, and Multiplication of Fractions by Whole Numbers

Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g. 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

3. Understanding that Geometric Figures Can be Analyzed and Classified Based on Their Properties

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Source: corestandards.org

Illinois Learning Standards: Grade 4 Overview

Operations and Algebraic Thinking ● Use the four operations with whole numbers to solve problems. ● Gain familiarity with factors and multiples. ● Generate and analyze patterns.
Number and Operations in Base Ten ● Generalize place value understanding for multi-digit whole numbers. ● Use place value understanding and properties of operations to perform multi-digit arithmetic.
Number and Operations – Fractions ● Extend understanding of fraction equivalence and ordering. ● Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. ● Understand decimal notation for fractions, and compare decimal fractions.
Measurement and Data ● Solve problems involving measurement and conversion of measurements from a larger to a smaller unit. ● Represent and interpret data. ● Geometric measurement: understand concepts of angle and measure angles.
Geometry ● Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Source: corestandards.org

Investigations in Number, Data, and Space 3
Scope and Sequence: Grade 4

Unit 1	**Arrays, Factors, and Multiplicative Comparisons** Multiplication and Division 1
Unit 2`	**Generating and Representing Measurement Data** Modeling with Data
Unit 3	**Multiple Towers and Cluster Problems** Multiplication and Division 2
Unit 4	**Measuring and Classifying Shapes** 2-D Geometry and Measurement
Unit 5	**Large Numbers and Landmarks** Addition, Subtraction, and the Number System

Unit 6	**Fraction Cards and Decimal Grids** Fractions and Decimals
Unit 7	**How Many Packages and Groups?** Multiplication and Division 3
Unit 8	**Penny Jars and Towers** Analyzing Patterns and Rules

Source: Investigations in Number, Data, and Space 3 (TERC, 2017)