Nebraska Mathematics

Grade 4

Adopted 2022

Nebraska Mathematical Processes

1. **Make sense of problems and persevere in solving them.** MP.1
2. **Reason quantitatively and abstractly and consider the reasoning of others.** MP.2
3. **Create and use representations to organize, record, and communicate mathematical ideas.** MP.3
4. **Analyze mathematical relationships to connect mathematical ideas.** MP.4
5. **Explain and justify mathematical ideas using precise mathematical language in written or oral communication.** MP.5

Grade 4

Number

1. Students will solve problems and reason with number concepts using multiple representations, make connections within math and across disciplines, and communicate their ideas. 4.CS.1
    1. Numeric Relationships: Students will demonstrate and represent multi-digit numbers using relationships with the base-ten number system. 4.N.1
        a. Read, write, and demonstrate multiple equivalent representations for whole numbers up to 1,000,000 and decimals to the hundredths using visual representations, standard form, and expanded form. 4.N.1.A
        b. Represent and justify comparisons of whole numbers up to 1,000,000 and decimals through the hundredths place using number lines and reasoning strategies. 4.N.1.B
        c. Recognize a digit in one place represents ten times what it represents in the place to its right. 4.N.1.C
        d. Use decimal notation for fractions with denominators of 10 or 100 (e.g., 43/100 = 0.43). 4.N.1.D
    2. Fractions and Decimals: Students will extend understanding of fractions by equivalence and ordering and will develop an understanding of decimals. 4.N.2
        a. Explain and demonstrate how a mixed number is equivalent to a fraction greater than one and how a fraction greater than one is equivalent to a mixed number using visual fraction models and reasoning strategies. 4.N.2.A
        b. Explain and demonstrate how equivalent fractions are generated by multiplying by a fraction equivalent to 1 using visual fraction models and the Identity Property of Multiplication. 4.N.2.B
        c. Compare and order fractions having unlike numerators or denominators using number lines, benchmarks, reasoning strategies, and/or equivalence. 4.N.2.C
    3. Operations with Fractions: Students will understand and demonstrate fractional computation. 4.N.3
        a. Decompose a fraction into a sum of fractions with the same denominator in more than one way and record each decomposition with an equation and a visual representation. 4.N.3.A
        b. Explain the meaning of addition and subtraction of fractions with like denominators using visual fraction models, properties of operations, and reasoning strategies. 4.N.3.B
        c. Add and subtract fractions and mixed numbers with like denominators. 4.N.3.C
        d. Solve authentic problems involving addition and subtraction of fractions and mixed numbers with like denominators. 4.N.3.D
        e. Multiply a fraction by a whole number using visual fraction models and properties of operations. 4.N.3.E
    4. Factors and Multiples: Students will find factors and multiples and classify numbers as prime or composite. 4.N.4

a. Determine whether a given whole number up to 100 is a multiple of a given one-digit number. 4.N.4.A

b. Determine factors of any whole number up to 100 and classify a number up to 100 as prime or composite. 4.N.4.B

Algebra

2. Solve problems and reason with algebra using multiple representations, make connections within math and across disciplines, and communicate their ideas. 4.CS.2

    1. Operations and Algebraic Thinking: Students will extend understanding of multiplication and division and apply operational properties to solve problems involving variables. 4.A.1

        a. Add and subtract multi-digit numbers using an algorithm. 4.A.1.A

        b. Multiply up to a four-digit whole number by a one-digit whole number and multiply a two-digit whole number by a two-digit whole number, using strategies based on place value, properties of operations, and algorithms. 4.A.1.B

        c. Divide up to a four-digit whole number by a one-digit divisor with and without a remainder using strategies based on place value. 4.A.1.C

        d. Determine the reasonableness of whole number products and quotients using estimations and number sense. 4.A.1.D

        e. Create a simple algebraic expression or equation using a variable for an unknown number to represent an authentic mathematical situation (e.g., 3 + n = 15, 81 ÷ n = 9). 4.A.1.E

        f. Solve one- and two-step authentic problems using the four operations including interpreting remainders and the use of a letter to represent the unknown quantity. 4.A.1.F

Geometry

3. Solve problems and reason with geometry using multiple representations, make connections within math and across disciplines, and communicate their ideas. 4.CS.3

    1. Shapes and Their Attributes: Students will draw and identify lines and angles and classify shapes by properties of their lines and angles. 4.G.1

        a. Identify, create, and describe points, lines, line segments, rays, angles, parallel lines, perpendicular lines, and intersecting lines. 4.G.1.A

        b. Justify the classification of angles as acute, obtuse, or right. 4.G.1.B

        c. Justify the classification of two-dimensional shapes based on the presence or absence of parallel and perpendicular lines or the presence or absence of specific angles. 4.G.1.C

        d. Recognize, draw, and justify lines of symmetry in two-dimensional shapes. 4.G.1.D

    2. Measurement: Students will generate simple conversions from a larger unit to a smaller unit to solve authentic problems and measure angles. 4.G.2

        a. Identify and use the appropriate tools, operations, and units of measurement, both customary and metric, to solve authentic problems involving time, length, weight, mass, and capacity. 4.G.2.A

        b. Determine the reasonableness of measurements involving time, length, weight, mass, capacity, and angles. 4.G.2.B

        c. Generate simple conversions from a larger unit to a smaller unit within the customary and metric systems of measurement. 4.G.2.C

        d. Measure angles in whole number degrees using a protractor and relate benchmark angle measurements to their rotation through a circle (e.g., 180^{o} = 1/2 of a circle). 4.G.2.D

        e. Recognize angle measures as additive and solve problems involving addition and subtraction to find unknown angles on a diagram. 4.G.2.E

    3. Area and Perimeter: Students will apply perimeter and area formulas for rectangles. 4.G.3

        a. Apply perimeter and area formulas for rectangles to solve authentic problems. 4.G.3.A

Data

4. Solve problems and reason with data/probability using multiple representations, make connections within math and across disciplines, and communicate their ideas. 4.CS.4

    1. Data Collection: Students will formulate questions to collect, organize, and represent data. 4.D.1

        a. Generate and represent data using line plots where the horizontal scale is marked off in appropriate units—whole numbers, halves, fourths, or eighths. 4.D.1.A

    2. Analyze Data and Interpret Results: Students will analyze the data and interpret the results. 4.D.2

        a. Solve authentic problems and analyze data involving addition or subtraction of fractions presented in line plots. 4.D.2.A