Nebraska Mathematics

Grade 7

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 7

Number

1. Solve problems and reason with number concepts using multiple representations, make connections within math and across disciplines, and communicate their ideas. 7.CS.1
    1. Numeric Relationships: Students will demonstrate, represent, and show relationships among rational numbers within the base-ten number system. 7.N.1
    2. Operations: Students will compute with rational numbers accurately. 7.N.2
        a. Add, subtract, multiply, and divide rational numbers (e.g., positive and negative fractions, decimals, and integers). 7.N.2.A
        b. Apply properties of operations (commutative, associative, distributive, identity, inverse, zero) as strategies for problem solving with rational numbers. 7.N.2.B

Ratios And Proportions

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2. Students will understand ratio concepts and use ratio reasoning to solve problems. 7.CS.2

    1. Proportional Relationships: Students will understand the concept of proportions, use language to describe the relationship between two quantities, and use proportions to solve authentic situations. 7.R.1

        a. Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table). 7.R.1.A

        b. Represent and solve authentic problems with proportions. 7.R.1.B

        c. Use proportional relationships to solve authentic percent problems (e.g., percent change, sales tax, mark-up, discount, tip). 7.R.1.C

        d. Solve authentic problems involving scale drawings. 7.R.1.D

Algebra

3. Solve problems and reason with algebra using multiple representations, make connections within math and across disciplines, and communicate their ideas. 7.CS.3

    1. Algebraic Processes: Students will apply the operational properties when evaluating expressions, and solving equations and inequalities. 7.A.1

        a. Use factoring and properties of operations to create equivalent algebraic expressions (e.g., $2x + 6 = 2(x + 3)$). 7.A.1.A

        b. Given the value of the variable(s), evaluate algebraic expressions, which may include absolute value. 7.A.1.B

        c. Solve one- and two-step equations involving rational numbers. 7.A.1.C

        d. Solve equations using the distributive property and combining like terms. 7.A.1.D

        e. Solve one- and two-step inequalities involving integers and represent solutions on a number line. 7.A.1.E

    2. Applications: Students will solve authentic problems with algebraic expressions, equations, and inequalities. 7.A.2

        a. Write one- and two-step equations involving rational numbers from words, tables, and authentic situations. 7.A.2.A

        b. Write one- and two-step inequalities to represent authentic situations involving integers. 7.A.2.B

Geometry

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4. Solve problems and reason with geometry using multiple representations, make connections within math and across disciplines, and communicate their ideas. 7.CS.4
    1. Attributes: Students will identify angle relationships and apply properties to determine angle measures. 7.G.1
        a. Apply properties of adjacent, complementary, supplementary, linear pair, and vertical angles to find missing angle measures. 7.G.1.A
    2. Coordinate Geometry: Students will determine location, orientation, and relationships on the coordinate plane. 7.G.2
        a. Draw polygons in the coordinate plane given coordinates for the vertices. 7.G.2.A
        b. Calculate vertical and horizontal distances in the coordinate plane to find perimeter and area of rectangles. 7.G.2.B
    3. Measurement: Students will identify geometric attributes that create two- and three-dimensional shapes in order to perform measurements and apply formulas to find area and volume. 7.G.3
        a. Solve authentic problems involving perimeter and area of composite shapes made from triangles and quadrilaterals. 7.G.3.A
        b. Determine surface area and volume of composite rectangular and triangular prisms. 7.G.3.B
        c. Determine the area and circumference of circles both on and off the coordinate plane using 3.14 for the value of Pi. 7.G.3.C

Data

5. Solve problems and reason with data/probability using multiple representations, make connections within math and across disciplines, and communicate their ideas. 7.CS.5
    1. Data Collection and Statistical Methods: Students will formulate statistical investigative questions, collect data, and organize data. 7.D.1
        a. Create an investigative question and collect data. 7.D.1.A
        b. Generate conclusions about a population based on a random sample. 7.D.1.B
        c. Identify and critique biases in various data representations. 7.D.1.C
    2. Analyze Data and Interpret Results: Students will represent and analyze the data and interpret the results. 7.D.2
    3. Probability: Students will interpret and apply concepts of probability. 7.D.3
        a. Find theoretical and experimental probabilities for compound independent and dependent events. 7.D.3.A
        b. Identify complementary events and calculate their probabilities. 7.D.3.B