North Dakota Mathematics Standards

Grade 7

Adopted 2023

Seventh Grade

Math Attributes

Problem-Solving

P. Learners can analyze information and formulate a flexible, systematic plan to problem-solve authentic situations and reflect on the reasonableness of the solution, making revisions when necessary. 7.MA.P

Connections

C. Learners can create connections within and across concepts and provide examples of how they relate to other learning and ideas using supporting evidence. 7.MA.C

Reasoning and Proof

R. Learners can reason logically, citing evidence to evaluate and explain what they see, think, and conclude through exploration and justification. 7.MA.R

Number and Operations

Number Systems

1. Describe the absolute value of a number as its distance from zero on a number line. 7.NO.NS.1
2. Recognize common fractions and decimal equivalencies up to a denominator of 10. Convert a rational number to a decimal using technology. 7.NO.NS.2

Operations

1. Add, subtract, multiply, and divide integers using visual models and properties of operations in multi-step problems, including authentic problems. 7.NO.O.1
2. Add, subtract, multiply, and divide non-negative fractions in multi-step problems, including authentic problems. 7.NO.O.2
3. Add, subtract, multiply, and divide non-negative decimals to the hundredth place in multi-step problems using strategies or procedures, including authentic problems. 7.NO.O.3

Algebraic Reasoning

Ratios and Proportional Relationships

1. Calculate unit rates associated with ratios of rational numbers, including ratios of lengths, areas, and other quantities measured in like or different units. 7.AR.RP.1
2. Analyze the relationship between the dependent and independent variables of a proportional relationship using graphs and tables. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, k) where k is the unit rate. 7.AR.RP.2
3. Identify the constant of proportionality in tables, graphs, equations, diagrams, and descriptions of proportional relationships. Represent proportional relationships by an equation of the form y = kx, where k is the constant of proportionality, and describe the meaning of each variable (y, k, x) in the context of the situation. 7.AR.RP.3
4. Use proportional relationships to solve multi-step problems involving ratios, percents, and scale drawings of geometric figures, including authentic problems. 7.AR.RP.4

Expressions and Equations

1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions involving variables, integers, and/or nonnegative fractions and decimals with an emphasis on writing equivalent expressions. 7.AR.EE.1
2. Write and solve equations of the form px + q = r and p(x + q) = r , including authentic problems. 7.AR.EE.2
3. Write and solve one- or two-step inequalities where coefficients and solutions are integers and/or non-negative fractions and decimals, including authentic problems. Graph the solution set of the inequality and interpret it in the context of the problem. 7.AR.EE.3

Geometry and Measurement (GM)

Area and Volume

1. Describe the relationship between the circumference and diameter of a circle (pi). Apply given formulas to calculate the area and circumference of a circle, including authentic problems. 7.GM.AV.1
2. Calculate areas of polygons by composing and/or decomposing them into rectangles and triangles, including authentic problems. Solve problems involving the volume of prisms and right pyramids using nets, including authentic problems. 7.GM.AV.2
3. Solve problems involving the volume of prisms and composite solids, including authentic problems. 7.GM.AV.3

Geometric Figures

1. Draw triangles from given conditions using appropriate tools. Defend whether a unique triangle, multiple triangles, or no triangle can be constructed when given three measures of angles or sides. 7.GM.GF.1
2. Describe the following angle-pair relationships: supplementary angles, complementary angles, vertical angles, and adjacent angles. Solve for an unknown angle in a figure by applying facts about these angles. 7.GM.GF.2

Data, Probability, and Statistics

Data Analysis

1. Identify the strengths and weaknesses of a population sample including bias in the process of the data collection. 7.DPS.D.1
2. Analyze and draw inferences about a population using single and multiple random samples by using given measures of center and variability for the numerical data set. 7.DPS.D.2

Probability

1. Develop a probability model to find probabilities of theoretical events and contrast probabilities from an experimental model. 7.DPS.P.1
2. Develop a probability model to find theoretical probabilities of independent compound events. 7.DPS.P.2