Field 034: Middle School Mathematics
REPA Educator Standards

Standard 1: Number and Quantity
Middle school mathematics teachers have a broad and comprehensive understanding of number operations and algebraic thinking, ratios and proportional relationships, and the number system, including:

1.1 properties of the real and complex numbers and their subsets

1.2 ordering, absolute value, and equivalence of different representations of numbers

1.3 number sense and place value, including bases other than base 10

1.4 interpreting numerical expressions and applying the order of operations

1.5 common factors and multiples

1.6 demonstrating computational fluency with rational numbers

1.7 applying ratio concepts and proportional reasoning to solve problems

1.8 solving problems using different representations of numbers

Standard 2: Algebra
Middle school mathematics teachers have a broad and comprehensive understanding of the extension of arithmetic to one- and two-variable expressions, equations, and inequalities; the relationship between dependent and independent variables; and the modeling and solving of problems with algebraic expressions and equations, including:

2.1 algebraic notation, language, and expressions

2.2 applying arithmetic properties to algebraic expressions and equations

2.3 applying the order of operations to algebraic expressions

2.4 solving one- and two-variable equations and inequalities

2.5 modeling and solving mathematical and real-life problems using numeric and algebraic expressions, equations, and inequalities

2.6 connections between proportional relationships, lines, and linear equations

2.7 graphical representations of equations and inequalities

2.8 solving linear equations and pairs of simultaneous linear equations

Standard 3: Functions

Middle school mathematics teachers have a broad and comprehensive understanding of the characteristics of functions, the evaluation and comparison of functions, and the use of functions to model relationships between quantities, including:

3.1 identifying and extending a variety of patterns and representing them algebraically

3.2 characteristics of relations and functions

3.3 linear functions, inequalities, systems, and their representations

3.4 modeling problems with linear functions, inequalities, systems, and their representations

3.5 behaviors of nonlinear functions and relationships between their various representations

3.6 modeling problems with quadratic and exponential functions and their representations

3.7 manipulation of functions, including transformations, translations, and compositions

Standard 4: Measurement and Geometry

Middle school mathematics teachers have a broad and comprehensive understanding of the principles and procedures of measurement, the properties of two- and three-dimensional figures, and applications of coordinate geometry, including:

4.1 converting units within and between the customary and metric measurement systems

4.2 points, lines, planes, and angle measure in Euclidean geometry

4.3 application of length, perimeter, area, and volume formulas of basic geometric figures

4.4 indirect measurement, including proportional reasoning, the Pythagorean theorem, and basic trigonometric ratios in right triangles

4.5 properties of figures and shapes in two and three dimensions

4.6 applying the concepts of similarity and congruence

4.7 coordinate and transformational geometry

4.8 modeling and solving problems using geometric concepts

4.9 reasoning and proof in Euclidean geometry

Standard 5: Statistics and Probability

Middle school mathematics teachers have a broad and comprehensive understanding of the collection and presentation of data, the summary and descriptions of statistical variability, and the fundamental principles of probability, including:

5.1 summarizing, representing, and interpreting data for one or two variables

5.2 making inferences and evaluating claims based on data

5.3 sampling, bias, and randomization

5.4 simple, compound, and conditional probabilities

5.5 representations of probabilities

5.6 modeling and solving problems with normal, uniform, and binomial probability distributions

Standard 6: Middle School Mathematics Instruction and Assessment

Middle school mathematics teachers have a broad and comprehensive understanding of content-specific curricula, instruction, and assessment in mathematics education, including:

6.1 the Indiana Academic Standards and Core Standards for Mathematics

6.2 the Common Core State Standards for Mathematics, the NCATE/NCTM Standards for Mathematics, and the ISTE National Educational Technology Standards

6.3 instructional strategies and resources for promoting student understanding of concepts and skills related to mathematics, including the use of multiple representations

6.4 evaluation and development of curricula and curricular materials (including textbooks and digital content) that support standards-based instruction and assessment

6.5 strategies and skills for planning and differentiating mathematics instruction, based on the Indiana Response to Instruction (RtI) model, to meet the needs of all learners

6.6 instructional strategies to promote student learning and to connect the *Standards for Mathematical Content* to the *Standards for Mathematical Practice* of the Common Core State Standards

6.7 communication methods that promote student learning and foster active inquiry, interaction, and collaboration in the mathematics classroom

6.8 strategies and skills for selecting, adapting, and using technology to enhance the teaching and learning of mathematics

6.9 strategies and skills for effectively assessing student understanding and mastery of essential mathematics concepts and skills

6.10 implementation of the Indiana Response to Instruction (RtI) model for all students, including differentiation in Tiers 1 and 2 and intensive intervention and extension in Tier 3