Algebra I | North Dakota Mathematics K–12 Standards Correlation to *Eureka Math*®

About *Eureka Math*

Created by Great Minds®, a mission-driven Public Benefit Corporation, *Eureka Math*® helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

Aligned

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

Data

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

Full Suite of Resources

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Math Attributes	Aligned Components of *Eureka Math*
9–12.MA.P Learners can analyze, execute, critique, and adapt approaches and solutions when problem-solving in novel situations.	Lessons in every module engage students in math attributes. These are indicated in margin notes included with every lesson.
9–12.MA.C Learners can create connections within and across concepts, using supporting evidence to interpret how they originate, extend, and relate to other learning, ideas, and life experiences.	Lessons in every module engage students in math attributes. These are indicated in margin notes included with every lesson.
9–12.MA.R Learners can reason logically, citing evidence to critique and explain what they see, think, and conclude through exploration, generalization, and validation.	Lessons in every module engage students in math attributes. These are indicated in margin notes included with every lesson.

Number and Operations: Learners will develop a foundational understanding of the number system, operations, and computational fluency to create connections and solve problems within and across concepts.

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.NO.1 Explain how the definition of rational exponents follows from extending the properties of integer exponents; rewrite simple expressions involving radicals and rational exponents using the properties of exponents.	Algebra II M3 Lesson 1: Integer Exponents Algebra II M3 Lesson 2: Base 10 and Scientific Notation Algebra II M3 Lesson 3: Rational Exponents Algebra II M3 Lesson 4: Properties of Exponents and Radicals
9-10.NO.3 Choose and interpret the scale and the units in graphs and data displays.	Algebra I M1 Lesson 1: Graphs of Piecewise Linear Functions Algebra I M1 Lesson 3: Graphs of Exponential Functions Algebra I M1 Lesson 5: Two Graphing Stories Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities Algebra I M1 Lesson 28: Federal Income Tax
9-10.NO.4 Define appropriate quantities and units for the purpose of descriptive modeling.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M5 Lesson 1: Analyzing a Graph Algebra I M5 Lesson 4: Modeling a Context from a Graph Algebra I M5 Lesson 7: Modeling a Context from Data Algebra I M5 Lesson 8: Modeling a Context from a Verbal Description Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.NO.5 Choose a level of accuracy or precision appropriate to limitations on measurement when reporting quantities.	Algebra I M1 Topic A: Introduction to Functions Studied This Year—Graphing Stories Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 7: Modeling a Context from Data Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description

Algebraic Reasoning: Learners will look for, generate, and make sense of patterns, relationships, and algebraic symbols to represent mathematical models while adopting approaches and solutions in novel situations.

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.AR.1 Use the structure of an expression (i.e., quadratic and exponential) to identify ways to rewrite it.	Algebra I M1 Lesson 6: Algebraic Expressions—The Distributive Property Algebra I M1 Lesson 7: Algebra Expressions—The Commutative and Associative Properties Algebra I M3 Lesson 6: Algebraic Expressions—The Distributive Property Algebra I M4 Lesson 1: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 2: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 3: Advanced Factoring Strategies for Quadratic Expressions Algebra I M4 Lesson 4: Advanced Factoring Strategies for Quadratic Expressions Algebra I M4 Lesson 5: The Zero Product Property Algebra I M4 Lesson 11: Completing the Square Algebra I M4 Lesson 12: Completing the Square Algebra I M5 Lesson 4: Modeling a Context from a Graph

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9-10.AR.2 Rearrange formulas to isolate a quantity or variable(s) of interest using the same reasoning as in solving equations.	Algebra I M1 Lesson 19: Rearranging Formulas
9-10.AR.3 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, and exponential functions.	Algebra I M1 Lesson 18: Equations Involving a Variable Expression in the Denominator Algebra I M1 Lesson 25: Solving Problems in Two Ways—Rates and Algebra Algebra I M1 Lesson 26: Recursive Challenge Problem—The Double and Add 5 Game Algebra I M1 Lesson 27: Recursive Challenge Problem—The Double and Add 5 Game Algebra I M4 Lesson 6: Solving Basic One-Variable Quadratic Equations Algebra I M4 Lesson 7: Creating and Solving Quadratic Equations in One Variable Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description
9-10.AR.4 Create linear and exponential equations in two or more variables to represent relationships between quantities. Graph equations on coordinate axes with appropriate labels and scales.	Algebra I M1 Lesson 5: Two Graphing Stories Algebra I M1 Lesson 20: Solution Sets to Equations with Two Variables Algebra I M1 Lesson 23: Solution Sets to Simultaneous Equations Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities Algebra I M5 Topic A: Elements of Modeling Algebra I M5 Lesson 4: Modeling a Context from a Graph Algebra I M5 Lesson 5: Modeling from a Sequence Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 8: Modeling a Context from a Verbal Description

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.AR.5 Justify each step in solving a linear equation that may or may not have a solution.	Algebra I M1 Lesson 12: Solving Equations Algebra I M1 Lesson 13: Some Potential Dangers when Solving Equations Algebra I M1 Lesson 17: Equations Involving Factored Expressions Algebra I M1 Lesson 18: Equations Involving a Variable Expression in the Denominator
9-10.AR.6 Solve linear equations and inequalities (to include compound inequalities) in one variable.	Algebra I M1 Lesson 10: True and False Equations Algebra I M1 Lesson 11: Solution Sets for Equations and Inequalities Algebra I M1 Lesson 12: Solving Equations Algebra I M1 Lesson 13: Some Potential Dangers when Solving Equations Algebra I M1 Lesson 14: Solving Inequalities Algebra I M1 Lesson 15: Solution Sets of Two or More Equations (or Inequalities) Joined by "And" or "Or" Algebra I M1 Lesson 16: Solving and Graphing Inequalities Joined by "And" or "Or" Algebra I M1 Lesson 17: Equations Involving Factored Expressions Algebra I M1 Lesson 18: Equations Involving a Variable Expression in the Denominator Algebra I M1 Lesson 19: Rearranging Formulas Algebra I M1 Lesson 25: Solving Problems in Two Ways—Rates and Algebra Algebra I M1 Lesson 27: Recursive Challenge Problem—The Double and Add 5 Game
9-10.AR.7 Solve a system of linear equations graphically and algebraically. Create and solve a system of linear equations in context.	Algebra I M1 Lesson 22: Solution Sets to Simultaneous Equations Algebra I M1 Lesson 23: Solution Sets to Simultaneous Equations Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities

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9-10.AR.8 Graph the solution set to a two-variable system of linear inequalities. Create and graph the solution set to a two-variable system of linear inequalities in context.	Algebra I M1 Lesson 21: Solution Sets to Inequalities with Two Variables Algebra I M1 Lesson 22: Solution Sets to Simultaneous Equations Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities
9-10.AR.9 Solve absolute value equations and inequalities in one or two variables.	Algebra I M1 Lesson 20: Solution Sets to Equations with Two Variables Algebra I M1 Lesson 21: Solution Sets to Inequalities with Two Variables Algebra I M3 Lesson 16: Graphs Can Solve Equations Too *Supplemental material is necessary to fully address this standard.*
9-10.AR.10 Solve quadratic equations in one variable by inspection (e.g., for $x^2 = 49$) taking square roots, the quadratic formula, and factoring, as appropriate to the initial form of the equation.	Algebra I M4 Lesson 5: The Zero Product Property Algebra I M4 Lesson 6: Solving Basic One-Variable Quadratic Equations Algebra I M4 Lesson 7: Creating and Solving Quadratic Equations in One Variable Algebra I M4 Lesson 15: Using the Quadratic Formula
9-10.AR.11 Add, subtract, and multiply polynomials.	Algebra I M1 Topic B: The Structure of Expressions Algebra I M4 Lesson 1: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 2: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 3: Advanced Factoring Strategies for Quadratic Expressions Algebra I M4 Lesson 4: Advanced Factoring Strategies for Quadratic Expressions

Algebraic Reasoning: Learners will look for, generate, and make sense of patterns, relationships, and algebraic symbols to represent mathematical models while adopting approaches and solutions in novel situations.

9-10.AR.F Functions: Learners will develop a foundational knowledge of functions and use them to model relationships between quantities.

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9-10.AR.F.1 Determine whether a relationship is a function given a table, graph, or words, identifying x as an element of the domain and $f(x)$ as an element in the range. Determine the domain and range of a function in context.	Algebra I M3 Lesson 1: Integer Sequences—Should You Believe in Patterns? Algebra I M3 Lesson 9: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 10: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 11: The Graph of a Function Algebra I M3 Lesson 12: The Graph of the Equation $y = f(x)$
9-10.AR.F.2 Use function notation, evaluate functions for inputs in their domains and interpret statements that use function notation in context.	Algebra I M3 Topic A: Linear and Exponential Sequences Algebra I M3 Lesson 8: Why Stay with Whole Numbers? Algebra I M3 Lesson 9: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 10: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 11: The Graph of a Function
9-10.AR.F.3 Sketch the key features (to include intercepts, maximums, minimums, and lines of symmetry, where applicable) of linear, exponential, and quadratic functions modeling the relationship between two quantities using tables, graphs, written descriptions, and equations.	Algebra I M1 Lesson 2: Graphs of Quadratic Functions Algebra I M1 Lesson 3: Graphs of Exponential Functions Algebra I M3 Lesson 13: Interpreting the Graph of a Function Algebra I M3 Lesson 14: Linear and Exponential Models—Comparing Growth Rates Algebra I M3 Lesson 23: Newton's Law of Cooling Algebra I M4 Lesson 8: Exploring the Symmetry in Graphs of Quadratic Functions Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M4 Lesson 10: Interpreting Quadratic Functions from Graphs and Tables

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.AR.F.3 ***continued***	Algebra I M4 Lesson 16: Graphing Quadratic Equations from the Vertex Form, $y = a(x - h)^2 + k$ Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ Algebra I M4 Lesson 23: Modeling with Quadratic Functions Algebra I M4 Lesson 24: Modeling with Quadratic Functions Algebra I M5 Lesson 1: Analyzing a Graph Algebra I M5 Lesson 2: Analyzing a Data Set Algebra I M5 Lesson 4: Modeling a Context from a Graph Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 7: Modeling a Context from Data
9-10.AR.F.4 Relate the domain of a linear, quadratic, or exponential function to its graph and, where applicable, to the quantitative relationship it describes.	Algebra I M3 Lesson 8: Why Stay with Whole Numbers? Algebra I M3 Lesson 9: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 10: Representing, Naming, and Evaluating Functions Algebra I M3 Lesson 11: The Graph of a Function Algebra I M3 Lesson 12: The Graph of the Equation $y = f(x)$ Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M5 Lesson 1: Analyzing a Graph Algebra I M5 Lesson 4: Modeling a Context from a Graph

North Dakota Mathematics K–12 Standards	Aligned Components of *Eureka Math*
9-10.AR.F.5 Calculate and interpret the rate of change of linear, quadratic, or exponential functions (presented algebraically or as a table) over specified intervals. Estimate the rate of change from a graph.	Algebra I M3 Lesson 6: Exponential Growth—U.S. Population and World Population Algebra I M3 Lesson 21: Comparing Linear and Exponential Models Again Algebra I M3 Lesson 22: Modeling an Invasive Species Population Algebra I M4 Lesson 8: Exploring the Symmetry in Graphs of Quadratic Functions Algebra I M4 Lesson 10: Interpreting Quadratic Functions from Graphs and Tables Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ Algebra I M5 Lesson 4: Modeling a Context from a Graph
9-10.AR.F.6 Write a function defined by an expression in different but equivalent forms to reveal and explain the different properties of the function. a. Use appropriate forms of linear, quadratic, and exponential functions to show zeros, extreme values, and symmetry (where applicable) and interpret them in context. b. Use the properties of an exponential function to classify it as growth or decay.	Algebra I M3 Lesson 4: Why Do Banks Pay YOU to Provide Their Services? Algebra I M3 Lesson 5: The Power of Exponential Growth Algebra I M3 Lesson 6: Exponential Growth—U.S. Population and World Population Algebra I M3 Lesson 7: Exponential Decay Algebra I M3 Lesson 14: Linear and Exponential Models—Comparing Growth Rates Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M4 Lesson 15: Using the Quadratic Formula Algebra I M4 Lesson 16: Graphing Quadratic Equations from the Vertex Form, $y = a(x - h)^2 + k$ Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ Algebra I M4 Lesson 21: Transformations of the Quadratic Parent Function, $f(x) = x^2$ Algebra I M4 Lesson 23: Modeling with Quadratic Functions

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9-10.AR.F.7 Compare key features of two linear, exponential, or quadratic functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Algebra I M3 Lesson 14: Linear and Exponential Models—Comparing Growth Rates Algebra I M4 Lesson 8: Exploring the Symmetry in Graphs of Quadratic Functions Algebra I M4 Lesson 22: Comparing Quadratic, Square Root, and Cube Root Functions Represented in Different Ways *Supplemental material is necessary to fully address this standard.*
9-10.AR.F.8 Identify situations that can be modeled with linear, quadratic, and exponential functions. Justify the most appropriate model for a situation based on the rate of change over equal intervals. Include situations in which a quantity grows or decays.	Algebra I M3 Lesson 3: Arithmetic and Geometric Sequences Algebra I M3 Lesson 4: Why Do Banks Pay YOU to Provide Their Services? Algebra I M3 Lesson 5: The Power of Exponential Growth Algebra I M3 Lesson 6: Exponential Growth—U.S. Population and World Population Algebra I M3 Lesson 7: Exponential Decay Algebra I M3 Lesson 14: Linear and Exponential Models—Comparing Growth Rates Algebra I M3 Lesson 21: Comparing Linear and Exponential Models Again Algebra I M3 Lesson 22: Modeling an Invasive Species Population Algebra I M3 Lesson 23: Newton's Law of Cooling Algebra I M5 Lesson 2: Analyzing a Data Set Algebra I M5 Lesson 3: Analyzing a Verbal Description Algebra I M5 Lesson 5: Modeling from a Sequence Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 8: Modeling a Context from a Verbal Description Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description

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9-10.AR.F.9 Identify the effect of transformations on the graph of a linear, absolute value, or quadratic function by replacing $f(x)$ with $af(x)$, $f(x-h)$, and $f(x)+k$, for specific values of a, h, and k (both positive and negative). Find the value of a, h, and k given the graph of the function.	Algebra I M3 Lesson 17: Four Interesting Transformations of Functions Algebra I M3 Lesson 18: Four Interesting Transformations of Functions Algebra I M3 Lesson 19: Four Interesting Transformations of Functions Algebra I M3 Lesson 20: Four Interesting Transformations of Functions Algebra I M4 Lesson 19: Translating Graphs of Functions Algebra I M4 Lesson 20: Stretching and Shrinking Graphs of Functions Algebra I M4 Lesson 21: Transformations of the Quadratic Parent Function, $f(x)=x^2$
9-10.AR.F.10 Find the inverse of a linear function and describe the relationship between the domain, range, and graph of the function and its inverse in context.	Precalculus and Advanced Topics M3 Lesson 18: Inverse Functions
9-10.AR.F.11 Interpret the parameters in a linear, quadratic, or exponential function in context.	Algebra I M3 Lesson 21: Comparing Linear and Exponential Models Again Algebra I M3 Lesson 22: Modeling an Invasive Species Population Algebra I M4 Lesson 23: Modeling with Quadratic Functions
9-10.AR.F.12 Identify, using graphs or tables, the solution(s) to linear and exponential functions $f(x)=g(x)$ as x-value(s) that result in equivalent y-values.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too

Data, Probability, and Statistics: Learners will ask and answer questions by collecting, organizing, and displaying relevant data, drawing inferences and conclusions, making predictions, and understanding and applying basic concepts of probability.

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9-10.DPS.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).	Algebra I M2 Topic A: Shapes and Centers of Distributions Algebra I M2 Topic B: Describing Variability and Comparing Distributions
9-10.DPS.2 Compare the center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets using statistics appropriate to the shape of the data distribution.	Algebra I M2 Lesson 3: Estimating Centers and Interpreting the Mean as a Balance Point Algebra I M2 Lesson 4: Summarizing Deviations from the Mean Algebra I M2 Lesson 5: Measuring Variability for Symmetrical Distributions Algebra I M2 Lesson 6: Interpreting the Standard Deviation Algebra I M2 Lesson 8: Comparing Distributions
9-10.DPS.3 Represent data on two quantitative variables on a scatter plot and describe how the variables are related. a. Fit a linear function to the data (with or without technology) if appropriate. b. Compute (using technology) and interpret the correlation coefficient of a linear fit. c. Interpret the meaning of the slope and y-intercept of the linear model in context. d. Interpolate and extrapolate the linear model to predict values.	Algebra I M2 Topic D: Numerical Data on Two Variables Algebra I M5 Lesson 7: Modeling a Context from Data

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9-10.DPS.4 Distinguish between correlation and causation.	Algebra I M2 Lesson 11: Conditional Relative Frequencies and Association Algebra I M2 Lesson 19: Interpreting Correlation Algebra I M2 Lesson 20: Analyzing Data Collected on Two Variables
9-10.DPS.5 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes or as unions, intersections, or complements of other events ("or," "and," "not").	Algebra II M4 Lesson 1: Chance Experiments, Sample Spaces, and Events Algebra II M4 Lesson 3: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 4: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 5: Events and Venn Diagrams Algebra II M4 Lesson 6: Probability Rules Algebra II M4 Lesson 7: Probability Rules
9-10.DPS.6 Recognize that event A is independent of event B if the probability of event A does not change in response to the occurrence of event B. Apply the formula $P(A \text{ and } B) = P(A) \cdot P(B)$ given that events A and B are independent.	Algebra II M4 Lesson 6: Probability Rules

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9-10.DPS.7 Recognize that the conditional probability of an event A given B is the probability that event A will occur given the knowledge that event B has already occurred. Calculate the conditional probability of A given B and interpret the answer in context.	Algebra II M4 Lesson 4: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 6: Probability Rules
9-10.DPS.8 Apply the formula $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ and interpret the answer in context.	Algebra II M4 Lesson 7: Probability Rules
9-10.DPS.9 Determine the number of outcomes using permutations and combinations in context.	Precalculus and Advanced Topics M5 Lesson 2: Counting Rules—The Fundamental Counting Principle and Permutations Precalculus and Advanced Topics M5 Lesson 3: Counting Rules—Combinations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities
9-10.DPS.10 Construct and interpret two-way frequency tables of data for two categorical variables. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.	Algebra I M2 Topic C: Categorical Data on Two Variables Algebra II M4 Lesson 2: Calculating Probabilities of Events Using Two-Way Tables Algebra II M4 Lesson 3: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables Algebra II M4 Lesson 4: Calculating Conditional Probabilities and Evaluating Independence Using Two-Way Tables