# Mathematics I | Minnesota K–12 Academic Standards in Mathematics Correlation to *Eureka Math²®*

When the original *Eureka Math®* curriculum was released, it quickly became the most widely used K–5 mathematics curriculum in the country. Now, the Great Minds® teacher–writers have created *Eureka Math²®*, a groundbreaking new curriculum that helps teachers deliver exponentially better math instruction while still providing students with the same deep understanding of and fluency in math. *Eureka Math²* carefully sequences mathematical content to maximize vertical alignment—a principle tested and proven to be essential in students' mastery of math—from kindergarten through high school.

While this innovative new curriculum includes all the trademark *Eureka Math* aha moments that have been delighting students and teachers for years, it also boasts these exciting new features:

### Teachability

*Eureka Math²* employs streamlined materials that allow teachers to plan more efficiently and focus their energy on delivering high-quality instruction that meets the individual needs of their students. Differentiation suggestions, slide decks, digital interactives, and multiple forms of assessment are just a few of the resources built right into the teacher materials.

### Accessibility

*Eureka Math²* incorporates Universal Design for Learning principles so all learners can access the mathematics and take on challenging math concepts. Student supports are built into the instructional design and are clearly identified in the *Teach* book. Further, the curriculum carries a focus on readability. By eliminating unnecessary words and using simple, clear sentences, the *Eureka Math²* teacher–writers have created one of the most readable mathematics curricula on the market. The curriculum's readability and accessibility help all students see themselves as mathematical thinkers and doers who are fully capable of owning their mathematics learning.

### Digital Engagement

The digital elements of *Eureka Math²* add to students' engagement with the math. The curriculum provides teachers with digital slides for each lesson. In addition, each grade level includes wordless videos that spark students' interest and curiosity. Students at all levels work through mathematical explorations that help lead to their own mathematical discoveries. Digital lessons and videos provide opportunities for students to wonder, explore, and make sense of mathematics, which contributes to the development of a strong, positive mathematical identity.

## Algebra

**Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.2.1.1**<br>Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain. | Math 1 M3 Topic A: Functions and Their Graphs<br>Math 1 M5 Lesson 1: Exploring Patterns<br>Math 1 M5 Lesson 2: The Recursive Challenge<br>Math 1 M5 Lesson 3: Recursive Formulas for Sequences<br>Math 1 M5 Lesson 4: Explicit Formulas for Sequences |
| **9.2.1.3**<br>Find the domain of a function defined symbolically, graphically or in a real-world context. | Math 1 M3 Lesson 4: The Graph of a Function<br>Math 1 M3 Lesson 13: Modeling Elevation as a Function of Time |
| **9.2.1.6**<br>Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function. | Math 1 M3 Lesson 5: The Graph of the Equation $y = f(x)$<br>Math 1 M3 Lesson 6: Using Pseudocode to Compare Graphs of Functions and Graphs of Equations<br>Math 1 M3 Lesson 7: Representations of Functions<br>Math 1 M5 Lesson 8: Graphing Exponential Functions<br>Math 1 M5 Lesson 9: Using Transformations to Graph Exponential Functions (Bases Greater Than $1$)<br>Math 1 M5 Lesson 10: Using Transformations to Graph Exponential Functions (Bases Between $0$ and $1$) |
| **9.2.1.7**<br>Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods. | Math 1 M5 Lesson 8: Graphing Exponential Functions<br>Math 1 M5 Lesson 9: Using Transformations to Graph Exponential Functions (Bases Greater Than $1$)<br>Math 1 M5 Lesson 10: Using Transformations to Graph Exponential Functions (Bases Between $0$ and $1$)<br>*Supplemental material is necessary to address reciprocals of linear functions for this standard.* |

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|---|---|
| **9.2.1.8**<br>Make qualitative statements about the rate of change of a function, based on its graph or table of values. | Math 1 M5 Lesson 17: Average Rate of Change<br>Math 1 M5 Lesson 18: Analyzing Exponential Growth<br>Math 1 M5 Lesson 19: Comparing Growth of Functions<br>Math 1 M5 Lesson 23: Modeling an Invasive Species Population |
| **9.2.1.9**<br>Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations. | Math 1 M3 Topic D: Transformations of Functions<br>Math 1 M5 Lesson 9: Using Transformations to Graph Exponential Functions (Bases Greater Than 1)<br>Math 1 M5 Lesson 10: Using Transformations to Graph Exponential Functions (Bases Between 0 and 1)<br>Math 1 M5 Lesson 12: Writing Equations for Exponential Functions from Tables or Graphs |

## Algebra

**Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.2.2.1**<br>Represent and solve problems in various contexts using linear and quadratic functions. | Math 1 M3 Lesson 13: Modeling Elevation as a Function of Time<br>Math 1 M5 Lesson 20: World Population Prediction<br>Math 1 M5 Lesson 22: Modeling the Temperature of Objects Cooling Over Time<br>*Supplemental material is necessary to address quadratic functions for this standard.* |

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.2.2.2**<br>Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth. | Math 1 M5 Lesson 16: Modeling Populations<br>Math 1 M5 Lesson 18: Analyzing Exponential Growth<br>Math 1 M5 Lesson 22: Modeling the Temperature of Objects Cooling Over Time<br>Math 1 M5 Lesson 23: Modeling an Invasive Species Population |
| **9.2.2.3**<br>Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. | Math 1 M5 Lesson 7: Exponential Functions<br>Math 1 M5 Lesson 12: Writing Equations for Exponential Functions from Tables or Graphs<br>Math 1 M5 Lesson 14: Exponential Growth<br>Math 1 M5 Lesson 15: Exponential Decay<br>Math 1 M5 Topic D: Comparing Linear and Exponential Models<br>Math 1 M6 Lesson 3: Analyzing Paint Splatters<br>Math 1 M6 Lesson 8: The Deal<br>Math 1 M6 Lesson 9: Solar System Models<br>*Supplemental material is necessary to address quadratic functions for this standard.* |
| **9.2.2.4**<br>Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively. | Math 1 M5 Lesson 5: Arithmetic and Geometric Sequences<br>Math 1 M5 Lesson 6: Representations of Arithmetic and Geometric Sequences<br>Math 1 M6 Lesson 8: The Deal |

## Algebra

**Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential, and $n$th root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.2.4.2**<br>Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations. | Math 1 M5 Lesson 11: Solving Equations Containing Exponential Expressions<br>Math 1 M5 Lesson 13: Calculating Interest<br>Math 1 M5 Lesson 14: Exponential Growth<br>Math 1 M5 Lesson 15: Exponential Decay<br>Math 1 M5 Lesson 16: Modeling Populations |
| **9.2.4.4**<br>Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines. | Math 1 M2 Lesson 16: Solution Sets of Systems of Linear Inequalities<br>Math 1 M2 Lesson 17: Graphing Solution Sets of Systems of Linear Inequalities<br>Math 1 M2 Lesson 18: Applications of Systems of Linear Inequalities<br>Math 1 M6 Lesson 10: Designing a Fundraiser |
| **9.2.4.5**<br>Solve linear programming problems in two variables using graphical methods. | Math 1 M2 Lesson 18: Applications of Systems of Linear Inequalities<br>Math 1 M6 Lesson 10: Designing a Fundraiser |

## Geometry & Measurement

**Calculate measurements of plane and solid geometric figures; know that physical measurements depend on the choice of a unit and that they are approximations.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.3.1.3**<br>Understand that quantities associated with physical measurements must be assigned units; apply such units correctly in expressions, equations and problem solutions that involve measurements; and convert between measurement systems. | Math 1 M1 Lesson 1: A Powerful Trio<br>Math 1 M3 Lesson 14: Comparing Models for Situations<br>Math 1 M6 Lesson 9: Solar System Models<br>Math 1 M6 Lesson 10: Designing a Fundraiser<br>Math 1 M6 Lesson 11: A Vanishing Sea<br>*Supplemental material is necessary to address converting between measurement systems for this standard.* |

## Geometry & Measurement

**Construct logical arguments, based on axioms, definitions and theorems, to prove theorems and other results in geometry.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.3.2.5**<br>Use technology tools to examine theorems, make and test conjectures, perform constructions and develop mathematical reasoning skills in multi-step problems. The tools may include compass and straight edge, dynamic geometry software, design software or Internet applets. | Math 1 M4 Lesson 6: Compass and Straightedge Constructions<br>Math 1 M4 Lesson 7: Constructing Perpendicular Lines<br>Math 1 M4 Lesson 8: Reflections of the Plane<br>Math 1 M4 Lesson 10: Rotations of the Plane with Bisected and Copied Angles<br>Math 1 M4 Lesson 11: Translations of the Plane<br>Math 1 M4 Lesson 22: Validating Triangle and Angle Constructions<br>Math 1 M4 Lesson 23: Validating Perpendicular Line Constructions<br>Math 1 M4 Lesson 26: Sierpinski Triangle |

## Geometry & Measurement

**Solve real-world and mathematical geometric problems using algebraic methods.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.3.4.4**<br>Use coordinate geometry to represent and analyze line segments and polygons, including determining lengths, midpoints and slopes of line segments. | Math 1 M2 Lesson 21: Using Coordinates to Determine Perimeters and Areas of Figures<br>Math 1 M6 Lesson 11: A Vanishing Sea |
| **9.3.4.6**<br>Use numeric, graphic and symbolic representations of transformations in two dimensions, such as reflections, translations, scale changes and rotations about the origin by multiples of $90°$, to solve problems involving figures on a coordinate grid. | Math 1 M4 Lesson 1: Geometric Transformations |

## Data Analysis & Probability

**Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.4.1.1**<br>Describe a data set using data displays, including box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. Measures of spread include standard deviation, range and inter-quartile range. Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics. | Math 1 M1 Topic D: Univariate Data<br>Math 1 M6 Lesson 1: Using Data to Edit Digital Photography |
| **9.4.1.2**<br>Analyze the effects on summary statistics of changes in data sets. | Math 1 M1 Topic D: Univariate Data |
| **9.4.1.3**<br>Use scatterplots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions. | Math 1 M2 Lesson 22: Relationships Between Quantitative Variables<br>Math 1 M2 Lesson 23: Using Lines to Model Bivariate Quantitative Data<br>Math 1 M2 Lesson 27: Interpreting Correlation<br>Math 1 M2 Lesson 28: Analyzing Bivariate Quantitative Data<br>Math 1 M6 Lesson 2: Using Residual Plots to Select Models for Data<br>Math 1 M6 Lesson 3: Analyzing Paint Splatters<br>Math 1 M6 Lesson 11: A Vanishing Sea |

## Data Analysis & Probability

**Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions.**

| Minnesota K–12 Academic Standards in Mathematics | Aligned Components of *Eureka Math²* |
|---|---|
| **9.4.2.2**<br>Identify and explain misleading uses of data; recognize when arguments based on data confuse correlation and causation. | Math 1 M2 Lesson 27: Interpreting Correlation<br>Math 1 M2 Lesson 28: Analyzing Bivariate Quantitative Data |