

Diocese of Madison
Math Education Standards and Benchmarks for Grades K-8

K.M Kindergarten Mathematics

- K.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - K.M.1.A Communicate mathematical ideas through manipulatives and number sentences.
 - K.M.1.B Use appropriate mathematical vocabulary, symbols, and notation, including +, -, =
 - K.M.1.C Use reason when determining solutions to grade-level mathematical processes.
- K.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - K.M.2.A Read, represent, order, and interpret whole numbers.
 - K.M.2.B Perform and explain addition, subtraction, and counting by groupings.
 - K.M.2.C Use appropriate numerical operations and relationships when problem-solving.
- K.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - K.M.3.A Describe objects in the environment using shape words (e.g., circle, square, rectangle, triangle)
- K.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - K.M.4.A Understand and use appropriate vocabulary
- K.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - K.M.5.A Work with data in the context of real-world situations.
 - K.M.5.B Draw conclusions based on data.
 - K.M.5.C Determine the likelihood of an occurrence of events.

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1.M First Grade Mathematics

- 1.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 1.M.1.A Communicate mathematical ideas through manipulatives, number sentences, and graphs.
 - 1.M.1.B Use appropriate mathematical vocabulary, symbols, and notation, including +, -, =, \$, cents, <, >
 - 1.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 1.M.1.D Recognize mathematical ideas as they appear in other subject areas.
 - 1.M.1.E Explain concepts clearly and logically and support solutions with evidence.
- 1.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 1.M.2.A Read, represent, order, and interpret whole numbers.
 - 1.M.2.B Perform and explain addition, subtraction, and counting by groupings.
 - 1.M.2.C Use appropriate numerical operations and relationships when problem-solving.
- 1.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 1.M.3.A Identify, draw, and build shapes
 - 1.M.3.B Compare similarities and differences among shapes (e.g. sides and corners)
- 1.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 1.M.4.A Select and use appropriate tools and techniques to measure accurately.
 - 1.M.4.B Measure time, money, and distance.
- 1.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 1.M.5.A Use graphs and tallies to display data.
 - 1.M.5.B Use graphs to interpret data.

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2.M Second Grade Mathematics

- 2.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 2.M.1.A Communicate mathematical ideas through manipulatives, number sentences, and graphs.
 - 2.M.1.B Use appropriate mathematical vocabulary, symbols, and notation, including +, -, \$, cents, <, >
 - 2.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 2.M.1.D Recognize mathematical ideas as they appear in other subject areas.
 - 2.M.1.E Explain concepts clearly and logically and support solutions with evidence.
- 2.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 2.M.2.A Read, represent, order, and interpret rational numbers.
 - 2.M.2.B Perform and explain addition, subtraction, and counting by groupings.
 - 2.M.2.C Use appropriate numerical operations and relationships when problem-solving.
- 2.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 2.M.3.A Identify, draw, and build shapes
 - 2.M.3.B Compare similarities and differences among shapes (e.g. faces, angles, sides, and vertices)
- 2.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 2.M.4.A Select and use appropriate tools and techniques to measure accurately.
 - 2.M.4.B Measure time, money, and distance.
- 2.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 2.M.5.A Use varying graphs to display data.
 - 2.M.5.B Problem-solve by reading graphs, tables, and charts
- 2.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 2.M.6.A Use letter, box, or symbol to stand for any number-measured quantity or object
 - 2.M.6.B Recognize and use appropriate grade-level properties and relations.

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3.M Third Grade Mathematics

- 3.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 3.M.1.A Communicate mathematical ideas using models and diagrams.
 - 3.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 3.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 3.M.1.D Use operations to solve everyday real-world problems.
 - 3.M.1.E Explain written solutions clearly and logically with supporting evidence.
- 3.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 3.M.2.A Read, write, compare, order, and interpret rational numbers.
 - 3.M.2.B Perform and explain addition and subtraction by re-grouping, as well as multiplication and division of whole numbers.
 - 3.M.2.C Use appropriate operational methods when problem-solving.
- 3.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 3.M.3.A Identify, classify, and create geometric figures.
 - 3.M.3.B Identify points and plot points within a rectangular coordinate system.
 - 3.M.3.C Identify and perform slides, flips, and turns.
 - 3.M.3.D Identify and use relationships among figures.
- 3.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 3.M.4.A Recognize and describe measurable attributes/units of measure.
 - 3.M.4.B Understand and demonstrate appropriateness of tools and units of measurement.
- 3.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 3.M.5.A Collect, organize, and display data using various methods.
 - 3.M.5.B Interpret and analyze information from displayed data to draw reasonable conclusions.
 - 3.M.5.C Determine the likelihood of an occurrence of events.
- 3.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 3.M.6.A Substitute letters or symbols for unknown numbers.
 - 3.M.6.B Recognize, describe, and analyze functional relationships using an input/output chart.
 - 3.M.6.C Solve multi-step problems.
 - 3.M.6.D Recognize and use appropriate grade-level properties and relations.

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4.M Fourth Grade Mathematics

- 4.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 4.M.1.A Communicate mathematical ideas using models and diagrams.
 - 4.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 4.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 4.M.1.D Use operations to solve everyday real-world problems.
 - 4.M.1.E Explain written solutions clearly and logically with supporting evidence.
- 4.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 4.M.2.A Read, write, compare, order, and interpret rational numbers.
 - 4.M.2.B Perform and explain addition and subtraction of fractions, as well as multiplication and division of whole numbers
 - 4.M.2.C Use appropriate operational methods when problem-solving.
- 4.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 4.M.3.A Identify, classify, create, and measure geometric figures.
 - 4.M.3.B Identify points and plot points within a rectangular coordinate system.
 - 4.M.3.C Distinguish between slides, flips, and turns.
 - 4.M.3.D Compare and contrast varying figures (e.g. quadrilaterals).
- 4.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 4.M.4.A Understand units of length, capacity, and weight in the customary system.
 - 4.M.4.B Understand and demonstrate appropriateness of tools and units of measurement.
- 4.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 4.M.5.A Collect, organize, and display data using various methods.
 - 4.M.5.B Extract, interpret, and analyze information from organized displayed data to draw reasonable conclusions.
 - 4.M.5.C Use simple models to conduct probability experiments.
- 4.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 4.M.6.A Substitute numbers for variables to solve an expression or equation.
 - 4.M.6.B Recognize, describe, and analyze functional relationships to identify a rule to describe pattern change.
 - 4.M.6.C Solve equations in a logical way.
 - 4.M.6.D Recognize and use appropriate grade-level properties and relations.

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5.M Fifth Grade Mathematics

- 5.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 5.M.1.A Communicate mathematical ideas using models and diagrams.
 - 5.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 5.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 5.M.1.D Use operations to solve everyday real-world problems.
 - 5.M.1.E Explain written solutions clearly and logically with supporting evidence.
- 5.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 5.M.2.A Read, write, compare, order, and interpret rational numbers.
 - 5.M.2.B Perform and explain multiplication and division of fractions and decimals, as well as convert fractions and decimals into percentages.
 - 5.M.2.C Use appropriate operational methods, including divisibility rules, when problem-solving.
- 5.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 5.M.3.A Identify, classify, create, and measure geometric figures.
 - 5.M.3.B Identify points and plot points within a rectangular coordinate system.
 - 5.M.3.C Draw slides, flips, and turns.
 - 5.M.3.D Compare and contrast varying figures using the sum of interior angles.
- 5.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 5.M.4.A Understand and calculate units of length, capacity, and weight in the customary and metric systems.
 - 5.M.4.B Understand and calculate perimeter, area, and circumference using geometric formulas.
- 5.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 5.M.5.A Collect, organize, and display data using various methods, including stem and leaf plots.
 - 5.M.5.B Extract, interpret, and analyze information from organized displayed data to draw reasonable conclusions.
 - 5.M.5.C Use simple models to conduct probability experiments.
- 5.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 5.M.6.A Substitute numbers for variables to solve an expression or equation.
 - 5.M.6.B Recognize, describe, and analyze functional relationships to identify a rule to describe pattern change.
 - 5.M.6.C Solve variable equations and inequalities in a logical way.
 - 5.M.6.D Recognize and use appropriate grade-level properties and relations.

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6.M Sixth Grade Mathematics

- 6.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 6.M.1.A Using technology, communicate mathematical ideas in various ways.
 - 6.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 6.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 6.M.1.D Use operations to solve everyday real-world problems.
 - 6.M.1.E Justify solutions by using step-by-step processes.
- 6.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 6.M.2.A Use mathematical notation appropriately (e.g. expanded, scientific, exponential)
 - 6.M.2.B Convert rational numbers. (e.g. fractions to decimals to percents)
 - 6.M.2.C Compare and contrast ratios and proportions; use prime factorization to find greatest common factor and least common multiple.
- 6.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 6.M.3.A Draw, construct, and describe geometrical figures and describe the relationships between them.
 - 6.M.3.B Understand the use of a rectangular coordinate system.
 - 6.M.3.C Use and identify transformations as reflections, rotations and translations.
 - 6.M.3.D Construct and represent congruent and similar figures.
- 6.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 6.M.4.A Understand, calculate, and convert metric and customary units.
 - 6.M.4.B Understand and calculate perimeter, area, and circumference using geometric formulas.
 - 6.M.4.C Determine measurements indirectly.
- 6.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 6.M.5.A Collect, organize, and display data using various methods, including circle graphs.
 - 6.M.5.B Extract, interpret, and analyze information from organized displayed data, including measurements of central tendencies, to draw reasonable conclusions.
 - 6.M.5.C Determine the likelihood of an occurrence of events using tree diagrams, lists, etc.
- 6.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 6.M.6.A Use variables to represent an unknown number, quantity, or object.
 - 6.M.6.B Work with linear and nonlinear patterns and relationships in a variety of ways (e.g. tables and graphs)
 - 6.M.6.C Recognize, describe, and analyze functional relationships to identify a rule to describe pattern change.
 - 6.M.6.D Solve one-step and two-step one variable equations in a logical way.
 - 6.M.6.E Apply properties in solving expressions, equations, and inequalities.

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7.M Seventh Grade Mathematics

- 7.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 7.M.1.A Using technology, communicate mathematical ideas in various ways.
 - 7.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 7.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 7.M.1.D Use operations to solve everyday real-world problems.
 - 7.M.1.E Justify solutions by using step-by-step processes.
- 7.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 7.M.2.A Use and apply mathematical notation appropriately (e.g. expanded, scientific, exponential)
 - 7.M.2.B Generate and explain equivalencies of rational numbers and percents.
 - 7.M.2.C Apply percents to discounts, simple interest, and sales tax; including percents less than one and greater than one hundred.
- 7.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 7.M.3.A Draw, construct, and describe geometrical figures and describe the relationships between them.
 - 7.M.3.B Understand the use of a rectangular coordinate system using the rules of transformation.
 - 7.M.3.C Use and identify transformations as reflections, rotations and translations.
 - 7.M.3.D Identify and use relationships among the corresponding parts of 2 and 3 dimensional figures.
- 7.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 7.M.4.A Understand, calculate, and convert metric and customary units.
 - 7.M.4.B Understand and apply Pythagorean Theorem to right triangles.
 - 7.M.4.C Determine measurements indirectly.
- 7.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 7.M.5.A Collect, organize, and display data using various methods, including box and whisker.
 - 7.M.5.B Extract, interpret, and analyze information from organized displayed data to draw reasonable conclusions and predict outcomes.
 - 7.M.5.C Use combinations and permutations to determine the likelihood of an occurrence of events.
- 7.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 7.M.6.A Use variables to represent an unknown number, quantity, or object.
 - 7.M.6.B Work with linear and nonlinear patterns and relationships in a variety of ways (e.g. algebraic equations, inequalities, expressions)
 - 7.M.6.C Recognize, describe, and analyze functional relationships (e.g. exponential growth and decay).
 - 7.M.6.D Solve multi-step one and two variable equations in a logical way.
 - 7.M.6.E Apply properties in solving expressions, equations, and inequalities.

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8.M Eighth Grade Mathematics

- 8.M.1 Mathematical Processes: Students will apply a variety of mathematical skills and strategies, including reasoning, oral and written communication.
 - 8.M.1.A Using technology, communicate mathematical ideas in various ways.
 - 8.M.1.B Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
 - 8.M.1.C Use reason when determining solutions to grade-level mathematical processes.
 - 8.M.1.D Use operations to solve everyday real-world problems.
 - 8.M.1.E Justify solutions by using step-by-step processes.
- 8.M.2 Number Operations & Relationships: Students will use numbers effectively for various purposes.
 - 8.M.2.A Read, write, compare, order, and interpret irrational and radical numbers; understand rules of exponents.
 - 8.M.2.B Understand absolute value, extracting roots, and raising numbers to a power.
 - 8.M.2.C Use appropriate operational methods, including percent of change.
- 8.M.3 Geometry: Students will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.
 - 8.M.3.A Draw, construct, and describe geometrical figures and describe the relationships between them.
 - 8.M.3.B Understand the use of a rectangular coordinate system using the rules of transformation.
 - 8.M.3.C Use and identify transformations as reflections, rotations and translations.
 - 8.M.3.D Construct and label parallel lines with transversal.
- 8.M.4 Measurement: Students will select and use appropriate tools and techniques to measure accurately.
 - 8.M.4.A Understand, calculate, and convert metric and customary units.
 - 8.M.4.B Understand and apply Pythagorean Theorem to right triangles including real-world and mathematical problems.
 - 8.M.4.C Determine measurements indirectly.
- 8.M.5 Statistics & Probability: Students will use data collection and analysis in problem-solving situations.
 - 8.M.5.A Collect, organize, and display data using various methods.
 - 8.M.5.B Extract, interpret, and analyze information from organized displayed data, including scatter plots, to draw reasonable conclusions and predict outcomes.
 - 8.M.5.C Determine the likelihood of an occurrence of events by comparing direct and indirect probabilities.
- 8.M.6 Algebraic Relationships: The student will discover, describe, and generalize simple and complex patterns and relationships.
 - 8.M.6.A Use variables to represent an unknown number, quantity, or object.
 - 8.M.6.B Work with linear and nonlinear patterns and relationships in a variety of ways (e.g. slope)
 - 8.M.6.C Recognize, describe, and analyze functional relationships (e.g. quadratic functions and polynomials)
 - 8.M.6.D Solve and graph equations, inequalities, and systems of equations in a logical way.
 - 8.M.6.E Apply properties in solving expressions, equations, and inequalities.