

## Mathematics Standards and Elements

Date Taught				Standards/Elements –Fourth Grade
				<i>Numbers and Operations</i>
				<b>M4N1. Students will further develop their understanding of how whole numbers are represented in the base-ten numeration system.</b>
				a. Identify place value names and places from hundredths through one million.
				b. Equate a number’s word name, its standard form, and its expanded form.
				<b>M4N2. Students will understand and apply the concept of rounding numbers.</b>
				a. Round numbers to the nearest ten, hundred, or thousand.
				b. Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand.
				c. Understand the meaning of rounding a decimal fraction to the nearest whole number.
				d. Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers.
				<b>M4N3. Students will solve problems involving multiplication of 2-3 digit numbers by 1-2 digit numbers.</b>
				<b>M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.</b>
				a. Know the division facts with understanding and fluency.
				b. Solve problems involving division by a 2-digit number (including those that generate a remainder).
				c. Understand the relationship between dividend, divisor, quotient, and remainder.
				d. Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. ( $2050 \div 50$ yields the same answer as $205 \div 5$ ).
				<b>M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.</b>
				a. Understand decimal fractions are a part of the base-ten system.
				b. Understand the relative size of numbers and order two digit decimal fractions.
				c. Add and subtract both one and two digit decimal fractions.
				d. Model multiplication and division of decimal fractions by whole numbers.
				e. Multiply and divide both one and two digit decimal fractions by whole numbers.
				<b>M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.</b>

			a. Understand representations of simple equivalent fractions.
			b. Add and subtract fractions and mixed numbers with common denominators. ( Denominators should not exceed twelve.)
			c. Convert and use mixed numbers and improper fractions interchangeably.
			<b>M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.</b>
			a. Describe situations in which the four operations may be used and the relationships among them.
			b. Compute using the order of operations, including parentheses.
			c. Compute using the commutative, associative, and distributive properties.
			d. Use mental math and estimation strategies to compute.
			<b><i>Measurement</i></b>
			<b>M4M1. Students will understand the concept of weight and how to measure it.</b>
			a. Use standard and metric units to measure the weight of objects.
			b. Know units used to measure weight (gram, kilogram, ounces, pounds and tons).
			c. Compare one unit to another within a single system of measurement.
			<b>M4M2. Students will understand the concept of angles and how to measure it.</b>
			a. Use tools, such as a protractor or angle ruler, and other methods such as paper folding, drawing a diagonal in a square, to measure angles.
			b. Understand the meaning and measure of a half rotation (180°) and a full rotation (360°).
			<b><i>Geometry</i></b>
			<b>M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.</b>
			a. Examine and compare angles in order to classify and identify triangles by their angles.
			b. Describe parallel and perpendicular lines in plane geometric figures.
			c. Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi).
			d. Compare and contrast the relationships among quadrilaterals.
			<b>M4G2. Students will understand fundamental solid figures.</b>
			a. Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices.
			b. Describe parallel and perpendicular lines and planes in connection with the rectangular prism.

			c. Construct/collect models for solid geometric figures (cube, prisms, cylinder, etc.).
			<b>M4G3. Students will use the coordinate system.</b>
			a. Understand and apply ordered pairs in the first quadrant of the coordinate system.
			b. Locate a point in the first quadrant in the coordinate plane and name the ordered pair.
			c. Graph ordered pairs in the first quadrant.
			<i>Algebra</i>
			<b>M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.</b>
			a. Understand and apply patterns and rules to describe relationships and solve problems.
			b. Represent unknowns using symbols, such as $\square$ and $\Delta$ .
			c. Write and evaluate mathematical expressions using symbols and different values.
			<i>Data Analysis</i>
			<b>M4D1. Students will gather, organize, and display data according to the situation and compare related features.</b>
			a. Represent data in bar, line and pictographs.
			b. Investigate the features and tendencies of graphs.
			c. Compare different graphical representations for a given set of data.
			d. Identify missing information and duplications in data.
			<i>Process Standards</i>
			<b>M4P1. Students will solve problems (using appropriate technology).</b>
			a. Build new mathematical knowledge thorough problem solving.
			b. Solve problems that arise in mathematics and in other contexts.
			c. Apply and adapt a variety of appropriate strategies to solve problems.
			d. Monitor and reflect on the process of mathematical problem solving.
			<b>M4P2. Students will reason and evaluate mathematical arguments.</b>
			a. Recognize reasoning and proof as fundamental aspects of mathematics.
			b. Make and investigate mathematical conjectures.
			c. Develop and evaluate mathematical arguments and proofs.

				d. Select and use various types of reasoning and methods of proof.
				<b>M4P3. Students will communicate mathematically.</b>
				a. Organize and consolidate their mathematical thinking through communication.
				b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
				c. Analyze and evaluate the mathematical thinking and strategies of others.
				d. Use the language of mathematics to express mathematical ideas precisely.
				<b>M4P4. Students will make connections among mathematical ideas and to other disciplines.</b>
				a. Recognize and use connections among mathematical ideas.
				b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
				c. Recognize and apply mathematics in contexts outside of mathematics
				<b>M4P5. Students will represent mathematics in multiple ways.</b>
				a. Create and use representations to organize, record, and communicate mathematical ideas.
				b. Select, apply, and translate among mathematical representations to solve problems.
				c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms/Symbols to be taught explicitly:**

sum, difference, product, quotient, mixed fraction, proper fraction, improper fraction, point, ray, line, line segment, parallel, perpendicular, diagonal line, plane, weight, ounce, pound, ton, gram, kilogram, protractor, degree, rotation, parallelogram, trapezoid, rhombus, quadrilateral, congruent, cube, rectangular prism, coordinate system, ordered pair, ratio, proportion, variable, line graph, pictograph