

Mathematics Standards and Elements

Date Taught				Standards/Elements –Fifth Grade
				<i>Numbers and Operations</i>
				M5N1. Students will further develop their understanding of whole numbers.
				a. Classify the set of counting numbers into subsets with distinguishing characteristics (odd/even, prime/composite).
				b. Find multiples and factors.
				c. Analyze and use divisibility rules.
				M5N2. Students will further develop their understanding of decimal fractions as part of the base-ten number system.
				a. Understand place value.
				b. Analyze the effect on the product when a number is multiplied by 10, 100, 1000, 0.1, and 0.01.
				M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.
				a. Model multiplication and division of decimal fractions by another decimal fraction.
				b. Explain the process of multiplication and division, including situations in which the multiplier and divisor are both whole numbers and decimal fractions.
				c. Multiply and divide with decimal fractions including decimal fractions less than one and greater than one.
				d. Understand the relationships and rules for multiplication and division of whole numbers also apply to decimal fractions.
				M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.
				a. Understand division of whole numbers can be represented as a fraction ($a/b = a \div b$).
				b. Understand the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number because it is the same as multiplying or dividing by one.
				c. Find equivalent fractions and simplify fractions.
				d. Model the multiplication and division of common fractions.
				e. Explore finding common denominators using concrete, pictorial, and computational models.
				f. Use $<$, $>$, or $=$ to compare fractions and justify the comparison.
				g. Add and subtract common fractions and mixed numbers with unlike denominators.

				h. Use fractions (proper and improper) and decimal fractions interchangeably.
				i. Estimate products and quotients.
				M5N5. Students will understand the meaning of percentage.
				a. Model percent on 10 by 10 grids.
				b. Apply percentage to circle graphs.
				<i>Measurement</i>
				M5M1. Students will extend their understanding of area of fundamental geometric plane figures.
				a. Estimate the area of fundamental geometric plane figures.
				b. Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area).
				c. Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height).
				d. Find the areas of triangles and parallelograms using formulae.
				e. Estimate the area of a circle through partitioning and tiling and then with formula (let $\pi = 3.14$). (Discuss square units as they apply to circles.)
				f. Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and find the sum of the areas of those shapes.
				M5M3. Students will measure capacity with appropriately chosen units and tools.
				a. Use milliliters, liters, fluid ounces, cups, pints, quarts, and gallons to measure capacity.
				b. Compare one unit to another within a single system of measurement (e.g., 1 quart = 2 pints).
				M5M4. Students will understand and compute the volume of a simple geometric solid.
				a. Understand a cubic unit (u^3) is represented by a cube in which each edge has the length of 1 unit.
				b. Identify the units used in computing volume as cubic centimeters (cm^3), cubic meters (m^3), cubic inches (in^3), cubic feet (ft^3), and cubic yards (yd^3).
				c. Derive the formula for finding the volume of a cube and a rectangular prism using manipulatives.
				d. Compute the volume of a cube and a rectangular prism using formulae.
				e. Estimate the volume of a simple geometric solid.
				f. Understand the similarities and differences between volume and capacity.
				<i>Geometry</i>

				M5G1. Students will understand congruence of geometric figures and the correspondence of their vertices, sides, and angles.
				M5G2. Students will understand the relationship of the circumference of a circle to its diameter is pi ($\pi \approx 3.14$).
				<i>Algebra</i>
				M5A1. Students will represent and interpret the relationships between quantities algebraically.
				a. Use variables, such as n or x , for unknown quantities in algebraic expressions.
				b. Investigate simple algebraic expressions by substituting numbers for the unknown.
				c. Determine that a formula will be reliable regardless of the type of number (whole numbers or decimal fractions) substituted for the variable.
				<i>Data Analysis</i>
				M5D1. Students will analyze graphs.
				a. Analyze data presented in a graph.
				b. Compare and contrast multiple graphic representations (circle graphs, line graphs, bar graphs, etc.) for a single set of data and discuss the advantages/disadvantages of each.
				M5D2. Students will collect, organize, and display data using the most appropriate graph.
				<i>Process Standards</i>
				M4P1. Students will solve problems (using appropriate technology).
				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.
				M4P2. Students will reason and evaluate mathematical arguments.
				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.
				M4P3. Students will communicate mathematically.
				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.
				M4P4. Students will make connections among mathematical ideas and to other disciplines.
				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
				M4P5. Students will represent mathematics in multiple ways.
				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:

simplify, common denominator, greatest common factor, least common multiple, congruence, %, percent, improper fraction, divisibility, multiple, factor, estimate, volume, tiling, irregular polygon, polygon, capacity, circumference, diameter, pi, circle graph, cup, pint, quart, gallon