

**FEDERAL WAY SCHOOL DISTRICT**  
**Mathematics Expectations: Pre-Algebra**

<b>CONTENT</b>	<b>PROCESS</b>
<p><b><u>1. The student understands and applies the concepts and procedures of mathematics.</u></b></p> <p><b>1.1 Number Sense</b></p> <p>1.1.1 applies associative, commutative, identity, inverse, and distributive properties to simplify and complete rational number operations</p> <p>1.1.2 translates between and orders simple fractions, mixed numbers, and improper fractions</p> <p>1.1.3 orders sets of rational numbers, integers, or real numbers relative to their values</p> <p>1.1.4 uses factors, multiples, and prime factorization to simplify and solve rational number computations (ex: writes <math>\frac{28}{48}</math> in reduced form)</p> <p>1.1.5 uses fraction, decimal, ratio and percent equivalencies to solve problems</p> <p>1.1.6 applies mental arithmetic to compute simple percentages (ex: 10%, 25%, 33.5%, 50%, 75%)</p> <p>1.1.7 writes decimals in scientific notation, and recognizes and interprets numbers in scientific notation</p> <p>1.1.8 computes in situations involving positive and negative rational numbers, decimals, integers, and real numbers</p> <p>1.1.9 creates and solves whole number proportions</p> <p>1.1.10 uses multiples of unit rate, or cost to estimate the result of a specified operation or purchase</p> <p>1.1.11 gives estimates for values involving unit multiples using mathematics (ex: if 5 bottles cost \$10, then 7 bottles cost \$14)</p> <p>1.1.12 determines the reasonableness of a calculation involving rational or decimal numbers</p> <p>1.1.13 differentiates between situations where estimates are sufficient and those for which exact values are required</p> <p><b>1.2 Measurement</b></p> <p>1.2.1 measures angles to the nearest degree with a protractor and estimates angle measurements to the nearest ten degrees</p> <p>1.2.2 knows the number of degrees in a circle, triangle, and quadrilateral</p> <p>1.2.3 applies formulas for perimeter and area for triangles, standard quadrilaterals, and circles; surface area and volume for prisms, cylinders, and spheres</p> <p>1.2.4 uses scales and ratios involving known measures to estimate or calculate measures of objects for which no direct information is given</p> <p>1.2.5 converts between metric measures using powers of ten and movement of the decimal point (ex: <math>42.31 \text{ cm} = 0.4231 \text{ m}</math>)</p> <p><b>1.3 Geometric Sense</b></p> <p>1.3.1 describes and classifies 3-dimensional figures using their defining attributes: faces, edges, angles, vertices, angle measures, and measures of faces</p> <p>1.3.2 recognizes, sets up, and interprets proportions between similar figures</p> <p>1.3.3 describes and constructs simple transformations for complex figures using combinations of translations, reflections, and rotations</p> <p>1.3.4 models and sketches 2-D versions of 3-D figures and 3-D figures from 2-D views</p> <p>1.3.5 displays points and lines in the coordinate plane</p> <p><b>1.4 Probability and Statistics</b></p> <p>1.4.1 discriminates between impossible and certain events, describing why they have the respective probabilities of 1 and 0</p> <p>1.4.2 collects a random sample and describes the population it depicts</p> <p>1.4.3 lists the possible outcomes for a simple event/experiment, uses them to calculate the probabilities of various outcomes, and understands the difference between independent and dependent events</p> <p>1.4.4 describes changes in a graph from one reporting point to the adjacent reporting point</p> <p>1.4.5 recognizes the type of data involved in a situation, counts or measures, and chooses the appropriate type of graph to represent it</p> <p>1.4.6 calculates and applies the mean, median, mode, and range for a set of data</p> <p><b>1.5 Algebraic Sense</b></p> <p>1.5.1 identifies and extends numerical patterns based on constant additions (arithmetic) and constant multiplication (geometric), and develops an explicit expression involving a variable for the nth term of a pattern</p> <p>1.5.2 finds the value associated with a variable in a formula given values for the other variables in the formula</p> <p>1.5.3 finds the solution to a linear equation with integral coefficients (ex: solves <math>5x+2=37</math>)</p> <p>1.5.4 writes an equation representing a specified relationship between quantities (ex: what number when multiplied by 4 and then increased by 2 is 38)</p> <p>1.5.5 graphs inequalities on the number line, and represents linear equations in tabular or graphical form</p>	<p><b><u>2. The student uses mathematics to define and solve problems.</u></b></p> <p>2.1 develops, uses and applies strategies for solving multi-step problems</p> <p>2.2 uses formulas, strategies, algebraic properties, and order of operations to analyze and solve problems</p> <p>2.3 identifies the information needed to solve a problem</p> <p>2.4 designs and conducts probability experiments</p> <p><b><u>3. The student uses mathematical reasoning.</u></b></p> <p>3.1 forms a conjecture based on data or a pattern, and uses examples to check reasonableness</p> <p>3.2 relates meaning of a solution to conditions of original problem</p> <p>3.3 develops a convincing argument for a conjecture based on evidence</p> <p>3.4 creates a counterexample to a given invalid statement or justification for a true statement</p> <p><b><u>4. The student communicates knowledge and understanding in both everyday and mathematical language.</u></b></p> <p>4.1 gathers information from sources (formula, value, etc.) related to a problem at hand using reading, listening, and observation skills</p> <p>4.2 organizes and represents data for use in determining patterns or solutions</p> <p>4.3 communicates ideas orally and in writing using everyday and mathematical language</p> <p><b><u>5. The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.</u></b></p> <p>5.1 relates the characteristics of mathematical concepts or algorithms to one another, such as factors to multiples or parallelograms to rhombi</p> <p>5.2 uses mathematical modeling in other disciplines</p> <p>5.3 illustrates how mathematics can be used in other career areas</p>