

TRI-COUNTY CHARTER SCHOOL PARTNERSHIP

**Power Standards
Math – Eighth Grade**

STRAND A: NUMBER SENSE, CONCEPTS, AND OPERATIONS

Standard 1: The student understands the different ways numbers are represented and used in the real world.

MA.A.1.3.2: The student understands the relative size of integers, fractions, and decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation, radicals; absolute value, and ratios.

1. Compares and orders numbers expressed in absolute value, scientific notation, integers, percents, numbers with exponents, fractions, decimals, radicals, and ratios.

MA.A.1.3.4: The student understands that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, and absolute value.

4. Identifies and explains the absolute value of a number.

Standard 3: The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.

MA.A.3.3.1: The student understands and explains the effects of addition, subtraction, multiplication, and division on whole numbers, fractions, including mixed numbers, and decimals, including the reverse relationships of positive and negative numbers.

3. Applies the properties of real numbers to solve problems (commutative, associative, distributive, identity, equality, inverse, and closure).

Standard 4: The student uses estimation in problem solving and computation.

MA.A.4.3.1: The student uses estimation strategies to predict results and to check the reasonableness of results.

2. Estimates to predict results and to check reasonableness of results.

STRAND B: MEASUREMENT

Standard 1: The student measures qualities in the real world and uses the measures to solve problems.

MA.B.1.3.2: The student uses concrete and graphic models to derive formulas for finding rates, distance, time, and angle measures.

2. Describes and uses rates of change (for example, temperature as it changes throughout the day, or speed as the rate of change in distance over time) and other derived measures.

MA.B.1.3.3: The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.

3. Solves real-world or mathematical problems involving the effects of the changes either to the dimensions of a figure or to the volume, surface area, area, perimeter, or circumference of figures.

Standard 2: The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).

MA.B.2.3.1: The student uses direct (measured) and indirect (not measured) measures to compare a given characteristic in either metric or customary units.

1. Finds measures of length, weight or mass, and capacity or volume using proportional relationships and properties of similar geometric figures.

STRAND C: GEOMETRY AND SPATIAL SENSE

Standard 1: The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.

MA.C.1.3.1: The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two- and three- dimensions.

4. Knows the properties of two- and three-dimensional figures.

Standard 2: The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed.

MA.C.2.3.1: The student understands the geometric concepts of symmetry, reflections, congruency, similarity, perpendicularity, parallelism, and transformation, including flips, slides, turns, and enlargements.

3. Identifies and performs the various transformations (reflection, translation, rotation, dilation) of a given figure on a coordinate plane.

Standard 3: The student uses coordinate geometry to locate objects in both two- and three-dimensions and to describe objects algebraically.

MA.C.3.3.1: The student represents and applies geometric properties and relationships to solve real-world and mathematical problems.

3. Applies the Pythagorean Theorem in real-world problems (for example, finds the relationship among sides in 45 – 45 degree and 30 – 60 degree triangles).

MA.C.3.3.2: The student identifies and plots ordered pairs in all four quadrants of a rectangular coordinate system (graph) and applies simple properties of lines.

3. Given the graph of a linear relationship, applies and explains the simple properties of lines on a graph, including parallelism, perpendicularity, and identifying the x and y intercepts, the midpoint of a horizontal or vertical line segment, and the intersection point of two lines.

STRAND D: ALGEBRAIC THINKING**Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.**

MA.D.1.3.1: The student describes a wide variety of patterns, relationships, and functions through models, such as manipulatives, tables, graphs, expressions, equations, and inequalities.

3. Uses the information provided in a table, graph, or rule to determine if a function is linear and justifies reasoning.

Standard 2: The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

MA.D.2.3.1: The student represents and solves real-world problems graphically, with algebraic expressions, equations, and inequalities.

4. Graphs linear equations on the coordinate plane using tables of values.
7. Simplifies algebraic expressions that represent real-world situations by combining like terms and applying the properties of real numbers.

MA.D.2.3.2: The student uses algebraic problem-solving strategies to solve real-world problems involving linear equations and inequalities.

1. Simplifies algebraic expressions with a maximum of two variables.

STRAND E: DATA ANALYSIS AND PROBABILITY

Standard 2: The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.

MA.E.2.3.1: The student compares experimental results with mathematical expectations of probabilities.

2. Calculates simple mathematical probabilities for independent and dependent events.

Standard 3: The student uses statistical methods to make inferences and valid arguments about real-world situations.

MA.E.3.3.1: The student formulates hypotheses, designs experiments, collects and interprets data, and evaluates hypotheses by making inferences and drawing conclusions based on statistics (range, mean, median, and mode) and tables, graphs, and charts.

3. Evaluates the hypothesis by making inferences and drawing conclusions based on statistical results.

MA.E.3.3.2: The student identifies the common uses and misuses of probability or statistical analysis in the everyday world.

1. Knows appropriate uses of statistics and probability in real-world situations.