

Course Syllabus

Mathematics, Pre-Algebra

Morgan County Curriculum 4.1 Middle Sch., Final
Morgan County School District

Number Properties and Operations (22%)

- The learner will be able to provide examples of and identify fractions, decimals, and percents.
- The learner will be able to describe and provide examples of representations of numbers (whole numbers, fractions in simplest form, mixed numbers, decimals, percents) and operations in a variety of equivalent forms using models, diagrams, and symbols (e.g., number lines, 10 by 10 grids, rectangular arrays, number sentences), based on real world and mathematical problems.
- The learner will be able to convert between any two of the following numbers: fractions, decimals, and percents (less than or equal to 100%; and will compare these numbers.
- The learner will be able to estimate to solve real-world and mathematical problems with whole numbers, fractions, decimals, and percents, checking for reasonable and appropriate computational results.
- The learner will be able to add, subtract, multiply, and divide whole numbers, fractions and decimals to solve real-world problems and to apply order of operations to simplify numerical expressions.
- The learner will be able to explain how operations (addition and subtraction; multiplication and division) are inversely related.
- The learner will be able to describe and apply ratios to solve real-world problems.
- The learner will be able to identify and apply prime numbers, composite numbers, prime factorization, factors, multiples, and divisibility to solve real-world and mathematical problems (e.g., prime factorization to determine a least common multiple [LCM] or greatest common factor [GCF]).
- The learner will be able to identify the use of properties (commutative properties of addition and multiplication, the associative properties of addition and multiplication and the identity properties for addition and multiplication) to multiplication numerical expressions.

Measurement (15%)

- The learner will be able to measure lengths (to the nearest eighth of an inch or the nearest centimeter) and will determine use in real-world and mathematical problems:
 - *Area and perimeter of triangles;
 - *Area and perimeter of quadrilaterals (rectangles, squares); (using Pythagorean theorem will not be required as a strategy); and
 - *Area and perimeter of compound figures composed of triangles and quadrilaterals.
- The learner will be able to estimate measurements in standard units including fractions and decimals.
- The learner will be able to explain how measurements and measurement formulas are related or different (perimeter and area of rectangles).
- The learner will be able to convert units within the same measurement system and use these units to solve real-world problems.

Geometry (20%)

- The learner will be able to describe and provide examples of the basic geometric elements (points, rays, lines, segments, angles [acute, right, obtuse], planes, radius, diameter, circumference).
- The learner will be able to describe, and provide examples of the elements (e.g., sides, vertices, angles, congruent parts) of two-dimensional figures (circles, triangles, quadrilaterals, regular polygons), and will apply these elements and figures to solve real-world and mathematical problems.
- The learner will be able to describe, provide examples of, and identify properties (e.g., vertices, angles, faces, edges, congruent parts) of common three-dimensional figures (spheres, cones, cylinders, prisms, and pyramids).
- The learner will be able to identify and describe congruent figures, and will apply congruent figures to solve real-world and mathematical problems.

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- The learner will be able to identify similar figures and apply similar figures to solve real-world and mathematical problems.
- The learner will be able to describe, provide examples of, and apply line symmetry to real-world and mathematical problems.
- The learner will be able to * reflect figures across a horizontal or vertical line in the first quadrant; * translate figures in a plane in the first quadrant; and * determine the coordinates of the image after transformation in the first quadrant.
- The learner will be able to identify rotations of figures in the plane (90 degrees and 180 degrees).
- The learner will be able to identify and graph ordered pairs on a positive coordinates system (Quadrant 1), correctly identifying the origin, axes, and ordered pairs; and will apply graphing in the coordinate identify to solve real-world and mathematical problems.

Data Analysis and Probability (15%)

- The learner will be able to analyze and make inferences from data displays (drawings, tables/charts, pictographs, bar graphs, circle graphs, line plots, Venn diagrams, line graphs, stem-and- leaf plots).
- The learner will be able to explain how different representations of data (e.g., tables, graphs, graphs, pots) are related.
- The learner will be able to determine and construct appropriate data displays (bar graphs, line plots, Venn diagrams, tables, line graphs), and will explain why the type of display is appropriate for the data.
- The learner will be able to determine and apply the mean, median, mode, and range of a set of data.
- The learner will be able to describe or determine (e.g., tables, tree diagrams) the sample space of an event for a real-world or mathematical situation.
- The learner will be able to determine single event probabilities based on the results of an experiment and will make inferences based on the data.

- The learner will be able to explore the theoretical probability of simple events.

Algebraic Thinking (28%)

- The learner will be able to extend and describe rules for patterns and find a missing term in a pattern from real-world and mathematical problems.
- The learner will be able to create tables for functions and will apply the tables to solve real-world problems.
- The learner will be able to describe, define, provide examples of, and apply to real-world and mathematical problem functions using problem, graphs and verbal rules.
- The learner will be able to explain how tables and graphs and patterns relate to each other.
- The learner will be able to explain how the change in one quantity affects change in another quantity (e.g., in tables or graphs, input/output tables).
- The learner will be able to substitute values for variables (up t two different variables) and evaluate algebraic expressions.
- The learner will be able to describe, define, and provide examples of variables and expressions with a missing value based on real-world and mathematical problems.
- The learner will be able to model and solve real-world and mathematical problems with simple equations and inequalities (e.g., $8x=4$, $x+2>5$).