

Course Syllabus

Mathematics, Math- Grade 7

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

Number Properties and Operations (30%)

- 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 among whole numbers, fractions, decimals, percents, and TT, and will compare and order these numbers.
- The learner will be able to estimate to solve real-world and mathematical problems with 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 (including positive whole number exponents) 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 add and subtract integers.
- The learner will be able to describe and apply ratios and proportional reasoning to solve real-world problems (e.g., percents, sales tax, discounts, rate).
- 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 justify a given step in solving problems.

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, trapezoids); (using Pythagorean theorem will not be required as a strategy);
 - *Area and circumference of circles; and *Area and perimeter of compound figures composed of triangles, quadrilaterals, and circles.
- The learner will be able to estimate measurements of regular and irregular polygons and circles in standard units.
- 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 find the measures of angles by estimation and measurement with a protractor or angle ruler.
- The learner will be able to covert units within the same measurement system and use these units to solve real-world problems.

Geometry (20%)

- The learner will be able to describe, provide examples of, and identify (using correct notation, label, and name) the basic geometric elements (e.g., points, segments, rays, lines, angles [acute, right, obtuse], and planes), in real world and mathematical problems.

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- The learner will be able to describe, and provide example of the elements (e.g., sides, vertices, angles, congruent parts) of two-dimensional figures (circles, triangles [acute, right, obtuse, scalene, isosceles, equilateral], quadrilaterals [square, rectangle, rhombus, parallelogram, trapezoid, 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 describe and provide examples of congruent and similar figures, and will apply congruent and similar figures to solve real-world and mathematical problems.
- The learner will be able to translate (slide) and reflect (flip) figures in a coordinate plane.
- The learner will be able to identify rotations (clockwise or counterclockwise) of figures about the origin in the plane (90 degrees, 180 degrees, 270 degrees).
- The learner will be able to identify and graph ordered pairs on a coordinate system, correctly identifying the origin, axes, and ordered pairs; and will apply graphing in the coordinate identify to solve real-world and mathematical problems.
- The learner will be able to determine and construct appropriate data displays (bar graphs, line plots, Venn diagrams, tables, line graphs, steam-and-leaf plots), and will explain why the type of display is appropriate for the data.
- The learner will be able to make decisions about how misleading representations affect interpretations and conclusions about data (e.g., changing the scale on a graph).
- The learner will be able to determine and apply the mean, median, mode, and range of a set of data, and will identify clusters, gaps, and outliers within the data.
- The learner will be able to apply counting techniques to determine the size of a sample space for a real-world or mathematical situation.
- The learner will be able to determine theoretical probabilities of simple events; determine probabilities based on the results of an experiment; and will make inferences from probability data.
- The learner will be able to tabulate experimental results from simulations and explain how theoretical and experimental probabilities are related.

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, scatter plots).
- The learner will be able to explain how different representations of data (e.g., tables, graphs, diagrams, plots) are related.
- The learner will be able to read/interpret, analyze, and make inferences from box and whisker plots of data and make predictions and draw conclusions from the data.

Algebraic Thinking (20%)

- 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 represent, analyze, and generalize first degree relationships using tables, graphs, and words, and will apply the relationships to solve real-world and mathematical problems.
- The learner will be able to explain how tables, graphs, patterns, verbal rules, and equations 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).

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- The learner will be able to substitute values for variables (up to three 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 one- or two-step single equations or inequalities (e.g., $2x+1=9$, $3x+3<9$). (Statements and solutions use only non-negative numbers).