Applied Math I

Students will:

Develop number sense to:

- Follow order of operations.
- Solve real number equations.
- Simplify rational and irrational numbers.

Solve algebraic expressions:

- Simplify algebraic equations, inequalities, and formulas.
- Use proportions to solve problems.

Understand and use linear functions to:

- Create tables of values.
- Find x and y intercepts.
- Graph linear equations.
- Find slopes.
- Identify parallel/perpendicular lines.

Use geometry to:

- Solve right triangles.
- Solve similar triangles.
- Describe properties of polygons.
- Calculate areas and volumes.

Use real world applications to:

- Graph using technology.
- Find rates of change.
- Understand direct & indirect variation.
- Solve polynomials using area models
- Collect, record, organize, and display a set of data.
- Make predictions using a box plot, scatter plot, or histogram for a given set of data.
- Find mean, median, mode, and range for a data set.
- Compute probabilities.

Applied Math II

Students will:

Apply geometric principles to:

- Classify types of angles, triangles, and polygons.
- Determine if lines are parallel or perpendicular.
- Identify a radius, chord, diameter, secant, tangent, arc, and central angle of a circle.
- Identify medians, altitudes, and angle bisectors in triangles.

Connect algebraic principles to geometry:

- Find circumference and area of circles, and arc length and area of sectors.
- Find the distance between two points and the midpoint of a segment.
- Find slopes of lines.
- Solve similar triangles and polygons using proportions.
- Use formulas to find surface area and volume of a variety of geometric shapes.
- Write an equation of a line perpendicular or parallel to a line through a given point.

Apply trigonometry principles:

- Solve special right triangles.
- Find the sine, cosine, and tangent of a right triangle.
- Use technology to find angle measures in triangles given ratios for the lengths of the sides.
- Find measures of sides and angles in triangles using the laws of sines and cosines.

Use models and applications:

- Find perimeter and area of polygons.
- Perform rotations, translations, and reflections in a coordinate plane.
- Collect, organize, and display data using technology.
- Compute geometric probabilities.
- Solve real world problems using geometric concepts.
- Display data using box plots, circle graphs, and scatter plots.

Pre-Calculus

Students will:

Demonstrate graphically the relationships between variables in *functions*: *

- Illustrate the concepts of maxima & minima, zeros, increasing, decreasing, asymptotes, holes, continuity, limits, domain, and range.
- Graph and identify transformations.
- Use symmetric properties of even and odd functions.

Analyze and solve *functions* algebraically: *

- Analyze rates of change of variables, including instantaneous and average rates of change.
- Evaluate limits.
- Combine and compose functions.

Utilize *functions* to represent real world situations: *

- Incorporate technology to solve problems.
- Find regression equations of best fit for “real world” data.
- Interpret and make predictions based on regression equations.

Use discrete mathematics and probability in problem solving:

- Understand arithmetic and geometric sequences and series.
- Find probability distributions.
- Calculate the conditional probability of an event and the probability of a compound event.

Graph polar and parametric equations, complex numbers, and conic sections:

- Solve problems using parametric equations.
- Understand applications of polar equations and vectors.
- Graph numbers in the complex plane.
- Analyze the graphs of conic sections.

**** Functions* in power standards 1-3 include the following types of functions: *polynomial, rational, exponential, logarithmic, trigonometric, and piecewise.***

Mathematics Power Standards

WASHINGTON COUNTY SCHOOL DISTRICT

Pre-Algebra

Students will:

Use order of operations, patterns, estimation, and number sense to solve problems:

- Solve Integer and rational number problems.
- Compare/convert rationals, decimals, fractions, and percents.
- Use scientific notation and exponents.

Simplify algebraic expressions and solve equations:

- Solve one and two step equations and inequalities.
- Graph linear equations and simple inequalities.
- Apply concepts to real world situations.

Organize and analyze data:

- Find measures of central tendencies.
- Create graphs (stem/leaf, bar, line plot, etc.).
- Calculate simple probability.

Use proportional reasoning to solve problems:

- Solve simple rate, ratio, proportion and percent problems.
- Convert measurements in both metric and standard units.
- Recognize similarities and crate scale drawings.

Apply geometric principles to solve problems:

- Classify and identify relationships of two and three dimensional objects.
- Calculate perimeter, circumference, area, and volume.
- Apply transformations to geometric shapes.

Algebra

Students will:

Solve equations and inequalities:

- Simplify algebraic and numeric expressions with both rational and irrational numbers.
- Solve equations, systems of equations, and inequalities.
- Solve proportions containing algebraic expressions.
- Use the Pythagorean Theorem and other formulas.

Multiply and factor polynomials:

- Find greatest common factors of algebraic terms.
- Multiply polynomials.
- Factor quadratic expressions.

Create and graph linear equations:

- Identify domain and range.
- Determine and analyze slopes of lines.
- Identify parallel and perpendicular slopes.
- Write equations in standard and slope-intercept forms.

Organize and analyze data:

- Make and use charts, graphs, and tables.
- Recognize patterns.
- Find, and make predictions with lines of best fit.
- Apply basic concepts of probability.

Relate real-world situations to algebra:

- Convert words and phrases into mathematical and/or algebraic symbols, expressions, and equations.
- Use technology to assist in solving and interpreting problems.
- Solve problems when the rate of change is a constant.
- Use appropriate units of measure.

Geometry

Students will:

Illustrate understanding of basic geometric concepts using logical reasoning and effective communication:

- Use appropriate vocabulary and notation.
- Classify and identify 2 and 3 dimensional shapes and their parts.
- Use appropriate tools to construct and sketch geometric figures.

Prove congruency and similarity of geometric figures:

- Identify and use relationships between congruent and similar figures.
- Solve problems with properties of congruency and similarity.

Identify and use trigonometric relations:

- Use calculators to find angle measures and trigonometric ratios.
- Solve problems involving triangles.

Connect geometry to algebra using the coordinate plane:

- Find lengths and slopes.
- Write equations of parallel and perpendicular lines.
- Graph and write equations of circles.
- Perform and analyze transformations.

Calculate area and volume:

- Find areas of polygons and sectors.
- Find surface area and volume of prisms, cylinders, pyramids, cones and spheres.
- Solve real-world problems involving surface area and volume.
- Calculate geometric probability.

Intermediate Algebra

Students will:

Solve problems involving *linear systems* and related *functions*:

- Solve systems graphically, algebraically, and using matrices.
- Use function notation and perform operations such as; combinations, compositions, inverse, graph, and transformations of a function.
- Solve and graph inequalities and absolute values.

Evaluate, solve and analyze *quadratic equations* and *functions*:

- Solve quadratics including those with complex solutions.
- Graph and work with quadratic functions.
- Perform operations with complex numbers.

Use spatial and logical reasoning to solve, graph, and interpret *trigonometric functions*:

- Work with trigonometric functions in degrees and radians using the unit circle.
- Work with graphs of trigonometric functions.

Draw conclusions using concepts of *probability* after collecting, organizing, and analyzing a data set:

- Calculate combinations and permutations.

Work with *rational expressions* and *equations* including those with rational exponents and radicals:

- Solve and perform operations on rational equations and expressions.
- Graph square root functions.