Mathematics	
Number Operations	
	Understand numbers, ways of representing numbers, relationships among numbers and number systems The students will be able to: ▪ Read, write, and compare numbers o Compare and order all rational numbers including percents, and find their approximate location on a number line ▪ Represent and use rational numbers o Use fractions, decimals and percents to solve problems ▪ Compose and decompose numbers o Recognize equivalent representations for the same number and generate them by decomposing and composing numbers, including scientific notation **Understand meanings of operations and how they relate to one another** The students will be able to: ▪ Describe effects of operations o Describe the effects of all operations on rational numbers including integers • Apply properties of operations o Apply properties of operations (including order of operations) to positive rational numbers and integers ▪ Apply operations on real and complex numbers o Approximate the value of square roots to the nearest whole number **Compute fluently and make reasonable estimates** The students will be able to: • Estimate and justify solutions o Estimate and justify the results of all operations on rational numbers • Use proportional reasoning o Solve problems involving proportions, such as scaling and finding equivalent ratios

Algebraic Relationships	
	Understand patterns, relations and functions The students will be able to: • Create and analyze patterns o Generalize patterns represented graphically or numerically with words or symbolic rules, using explicit notation • Classify objects and representations o Compare and contrast various forms of representations of patterns • Identify and compare functions o Identify functions as linear of nonlinear from tables, graphs or equations **Represent and analyze mathematical situations and structures using algebraic symbols** The students will be able to: • Represent mathematical situations o Use symbolic algebra to represent and solve problems that involve linear relationships • Describe and use mathematical manipulation o Use properties to generate equivalent forms for simple algebraic expressions that include all rationals **Use mathematical models to represent and understand quantitative relationships** **Analyze change in various contexts** The students will be able to: • Use mathematical models o Model and solve problems, using multiple representations such as graphs, tables, and linear equations **Analyze change in various contexts** The students will be able to: • Analyze change o Analyze the nature of changes (including slope and intercepts) in quantities in linear relationships

Geometric and Spatial Relationships	
	Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships The students will be able to: • Describe and use geometric relationships o Identify the 2-dimensional cross-section of a 3-dimensional shape • Apply geometric relationships o Describe relationships between corresponding sides corresponding angles and corresponding perimeters of similar polygons **Specify locations and describe spatial relationships using coordinate geometry and other representational systems** The students will be able to: • Use coordinate systems o Use coordinate geometry to construct and identify geometric shapes in the coordinate plane using their properties **Apply transformations and use symmetry to analyze mathematical situations** The students will be able to: • Use transformations on functions o Describe the relationship between the scale factor and the perimeter of the image using a dilation (contractions-magnifications) (stretching/shrinking) • Use symmetry Determine all lines of symmetry of polygons **Use visualization, spatial reasoning and geometric modeling to solve problems** The students will be able to: • Recognize and draw three-dimensional representations o Use spatial visualizations to identify various 2-dimensional views of isometric drawings • Draw and use visual models o Draw and use visual models to represent and solve problems

Measurement	
	Understand measurable attributes of objects and the units, systems and processes of measurement The students will be able to: • Determine unit of measurement o Identify and justify the unit of measure for volume (customary and metric) • Identify equivalent measures o Identify and justify the unit of measure for volume measures within a system of measurement (e.g., sq ft. to sq in., m^3 to cm^3) • Tell and use units of time o Solve problems involving addition and subtraction of time (hours, minutes and seconds) **Apply appropriate techniques, tools and formulas to determine measurements** The students will be able to: • Use angle measurement o Use tools to measure angles to the nearest degree and classify the angle as acute, obtuse, tight, straight, or reflex • Apply geometric measurements o Solve problems involving circumference and/or area of a circle and surface area/volume of a rectangular of triangular prism, or cylinder • Analyze precision o Analyze precision and accuracy in measurement situations and determine number of significant digits • Use relationships within a measurement system o Convert from one unit to another within a system of measurement (capacity) and convert square or cubic units within the same system of measurement

Data and Probability	
	Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them The students will be able to: • Represent and interpret data o Select, create and use appropriate graphical representation of data (including scatter plots) and box plots (box and whiskers) **Select and use appropriate statistical methods to analyze data** The students will be able to: • Describe and analyze date o Find, use and interpret measures of center, outliers and spread, including range and interquartile range • Compare data representations o Compare different representations of the same data and evaluate how well each representation shows important aspects of the data **Develop and evaluate inferences and predictions that are based on data** The students will be able to: • Develop and evaluate inferences o Make conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit **Understand and apply basic concepts of probability** The students will be able to: • Apply basic concepts of probability o Use models to compute the probability of an event and make conjectures (based on theoretical probability) about the results of experiments