

<u>Mathematics</u>	
Number Operations	
	<p>Understand numbers, ways of representing numbers, relationships among numbers and number systems</p> <p>The students will be able to:</p> <ul style="list-style-type: none"> • Read, write, and compare numbers <ul style="list-style-type: none"> ◦ Compare and order rational and irrational numbers, including finding their approximate locations on a number line • Represent and use rational numbers <ul style="list-style-type: none"> ◦ Use real numbers and various models, drawing, etc. to solve problems • Compose and decompose numbers <ul style="list-style-type: none"> ◦ Use a variety of representations to demonstrate an understanding of very large and very small numbers <p>Understand meanings of operations and how they relate to one another</p> <p>The students will be able to:</p> <ul style="list-style-type: none"> • Describe effects of operations <ul style="list-style-type: none"> ◦ Describe the effects of operations, such as multiplication, division, and computing powers and roots on the magnitude of quantities • computing powers and roots on the magnitude of quantities • Apply properties of operations <ul style="list-style-type: none"> ◦ Apply properties of operations to all rational numbers including order of operations and inverse operations • Apply operations on real and complex numbers <ul style="list-style-type: none"> ◦ Apply operations to real numbers, using mental computation or paper-and-pencil calculations for simple cases and technology for more complicated cases <p>Compute fluently and make reasonable estimates</p> <p>The students will be able to:</p> <ul style="list-style-type: none"> • Estimate and justify solutions <ul style="list-style-type: none"> ◦ Judge the reasonableness of numerical

	<p>computations and their results</p> <ul style="list-style-type: none"> • Use proportional reasoning <ul style="list-style-type: none"> ◦ Solve problems involving proportions
Algebraic Relationships	
	<p>Understand patterns, relations and functions The students will be able to:</p> <ul style="list-style-type: none"> • Create and analyze patterns <ul style="list-style-type: none"> ◦ Generalize patterns using explicitly or recursively defined functions • Classify objects and representations <ul style="list-style-type: none"> ◦ Compare and contrast various forms of representations of patterns • Identify and Compare functions <ul style="list-style-type: none"> ◦ Understand and compare the properties of linear and nonlinear functions • Describe the effects of parameter changes <ul style="list-style-type: none"> ◦ Describe the effects of parameter changes on linear, exponential growth/decay and quadratic functions including intercepts <p>Represent and analyze mathematical situations and structures using algebraic symbols The students will be able to:</p> <ul style="list-style-type: none"> • Represent mathematical situations <ul style="list-style-type: none"> ◦ Use symbolic algebra to represent and solve problems that involve linear and quadratic relationships including equations and inequalities • Describe and use mathematical manipulation <ul style="list-style-type: none"> ◦ Describe and use algebraic manipulations, including factoring and rules of integer exponents and apply properties of exponents (including order of operations) to simplify expressions • Utilize equivalent forms <ul style="list-style-type: none"> ◦ Use and solve equivalent forms of equations (linear, absolute value, and quadratic) • Utilize systems <ul style="list-style-type: none"> ◦ Use and solve systems of linear equations or inequalities with 2 variables

	<p>Use mathematical models to represent and understand quantitative relationships The students will be able to:</p> <ul style="list-style-type: none"> • Use mathematical models <ul style="list-style-type: none"> ○ Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem <p>Analyze change in various contexts The students will be able to:</p> <ul style="list-style-type: none"> • Analyze change <ul style="list-style-type: none"> ○ Analyze linear and quadratic functions by investigating rates of change, intercepts and zeros
<p>Geometric and Spatial Relationships</p>	
	<p>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships The students will be able to:</p> <ul style="list-style-type: none"> • Describe and use geometric relationships <ul style="list-style-type: none"> ○ Describe, classify and generalize relationships between and among types of a) 2-dimensional objects and b) 3-dimensional objects using their defining properties including Pythagorean Theorem • Apply geometric relationships <ul style="list-style-type: none"> ○ Apply geometric properties such as similarity and angle relationship to solve multi-step problems in 2 dimensions <p>Specify locations and describe spatial relationships using coordinate geometry and other representational systems The students will be able to:</p> <ul style="list-style-type: none"> • Use coordinate systems <ul style="list-style-type: none"> ○ Use coordinate geometry to analyze properties of right triangles and quadrilaterals (including the use of the Pythagorean Theorem)

	<p>Apply transformations and use symmetry to analyze mathematical situations The students will be able to:</p> <ul style="list-style-type: none"> • Use transformations on objects <ul style="list-style-type: none"> ○ Reposition shapes under formal transformations such as reflection, rotation and translation • Use transformations on functions <ul style="list-style-type: none"> ○ Describe the relationship between the scale factor and the area of the image using a dilation (stretching/shrinking) • Use symmetry <ul style="list-style-type: none"> ○ Identify the number of rotational symmetries of regular polygons <p>Use visualization, spatial reasoning and geometric modeling to solve problems The students will be able to:</p> <ul style="list-style-type: none"> • Recognize and draw three-dimensional representation <ul style="list-style-type: none"> ○ Create isometric drawings from a given mat plan • Draw and use visual models <ul style="list-style-type: none"> ○ Draw or use visual models to represent and solve problems
<p>Measurement</p>	
	<p>Apply appropriate techniques, tools and formulas to determine measurements The students will be able to:</p> <ul style="list-style-type: none"> • Use angle measurement <ul style="list-style-type: none"> ○ Solve problems of angle measure, including those involving triangles and parallel lines cut by a transversal • Analyze precision <ul style="list-style-type: none"> ○ Describe the effects of operations, such as multiplication, division and computing powers and roots on magnitudes of quantities and effects of computation on precision which include the judging of reasonable of numerical computations and their results • Use relationships within a measurement system <ul style="list-style-type: none"> ○ Use unit analysis to solve problems

Data and Probability	
	<p>Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them The students will be able to:</p> <ul style="list-style-type: none"> • Formulate questions <ul style="list-style-type: none"> ○ Formulate questions and collect data about a characteristic which include sample spaces and distributions • Represent and interpret data <ul style="list-style-type: none"> ○ Select and use appropriate graphical representation of data and given one-variable quantitative data, display the distribution and describe its shape <p>Select and use appropriate statistical methods to analyze data The students will be able to:</p> <ul style="list-style-type: none"> • Describe and analyze data <ul style="list-style-type: none"> ○ Apply statistical measures of center to solve problems • Represent data algebraically <ul style="list-style-type: none"> ○ Given a scatter plot, determine an equation for a line of best fit <p>Develop and evaluate inferences and predictions that are based on data The students will be able to:</p> <ul style="list-style-type: none"> • Develop and evaluate inferences <ul style="list-style-type: none"> ○ 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