

**USD 203 Piper
Synergistics Curriculum**

**Course: Synergistics Modules
(Elective Credit)
Grade(s): 7-8
Credit(s) .25 per quarter**

Gr. 7 Math Standards	Benchmark	Indicators	Alternative Energy	Applied Physics	CADD	Cell Structures	CNC Manufacturing	Flight Technology	Forces	Forensic Science	Robots	Video Production	Computer Graphics
1--NUMBERS & COMPUTATION	The student uses numerical and computational concepts and procedures in a variety of situations.												
	1--Number Sense	The student demonstrates number sense for rational numbers, the irrational number pi, and simple algebraic expressions in one variable in a variety of situations.											
		1.1.1K. Knows, explains, and uses equivalent representations for rational numbers and simple algebraic expressions including integers, fractions, decimals, percents and ratios; integer bases with whole number exponents; positive rational numbers written in scientific notation with positive integer exponents; time; and money (2.4.K1a-c) \$.	X	X	X	X	X	X	X	X	X	X	X
	2--Number Systems and their Properties	The student demonstrates an understanding of the rational number system and the irrational number pi; recognizes, uses, and describes their properties; and extends these properties to algebraic expressions in one variable.											
		1.2.1A. Generates and/or solves real-world problems with rational numbers and the irrational number pi using the concepts of these properties to explain reasoning \$:	X	X	X	X	X						X
		a. commutative and associative properties for addition and multiplication,	X	X	X	X	X						X
		b. distributive property.	X	X	X	X	X						X
		c. substitution property	X	X	X	X	X						X
		d. additive and multiplicative identities	X	X	X	X	X						X
		e. symmetric property of equality	X	X	X	X	X						X
		f. zero property of multiplication	X	X	X	X	X						X
		g. addition and multiplication properties of equality	X	X	X	X	X						X
		h. additive and multiplicative inverse properties	X	X	X		X						X
		1.2.3K. Names, uses, and describes these properties with the rational numbers system and demonstrates their meaning including the use of concrete objects (2.4.K1a) \$:	X	X	X	X	X	X	X	X	X	X	X
		a. commutative properties of addition and multiplication (changing the order of the numbers does not change the solution)	X	X	X	X	X	X	X	X	X	X	X
	b. associative properties for addition and multiplication (changing the grouping of the numbers does not change the solution)	X	X	X	X	X	X	X	X	X	X	X	
	c. (distributive property distributing multiplication or division over addition or subtraction)	X	X	X	X	X	X	X	X	X	X	X	

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		d. substitution property (one name of a number can be substituted for another name of the same number).	X	X	X		X	X	X	X	X	X	X
		1.2.4K. Uses and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a) \$:	X	X	X	X	X						X
		a. identity properties for addition and multiplication (additive identity -zero added to any number is equal to that number; multiplicative identity- one multiplied by any number is equal to that number)	X	X	X	X	X						X
		b. symmetric property of equality	X	X	X	X	X						X
		c. zero property of multiplication (any number multiplied by zero is zero)	X	X	X	X	X						X
		d. addition and multiplication properties of equality (adding/multiplying the same number to each side of an equation results in an equivalent equation)	X	X	X		X						X
		e. additive and multiplicative inverse properties	X	X	X		X						X
	3--Estimation	The student uses computational estimation with rational numbers and the irrational number pi in a variety of situations.											
		1.3.1K. Estimates quantities with combinations of rational numbers and/or the irrational number pi using various computational methods including mental math, paper and pencil, concrete objects, and/or appropriate technology (2.4.K1a) \$.	X	X	X	X		X	X	X	X	X	X
		1.3.2K. Uses various estimation strategies and explains how they were used to estimate rational number quantities or the irrational number pi (2.4.K1a) \$.	X	X	X	X		X	X	X	X	X	X
		1.3.3K. Recognizes and explains the difference between an exact and an approximate answer (2.4.K1a).			X								
	4--Computation	The student models, performs, and explains computation with rational numbers, the irrational number pi, and first-degree algebraic expressions in one variable in a variety of situations.											
		1.4.1K. Computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete materials, and appropriate technology (2.4.K1a-c) \$.	X	X	X	X	X	X	X	X	X	X	X
		1.4.1A. Generates and/or solves one- and two-step real-world problems using these computational procedures and mathematical concepts (2.4.A1a) \$:							X				
		a addition, subtraction, multiplication, and division of rational numbers with a special emphasis on fractions and expressing answers in simplest form .							X				

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		b. addition, subtraction, multiplication, and division of rational numbers with a special emphasis on integers.							X				
		c. first degree algebraic expressions in one variable .							X				
		d. percentages of rational number .							X				
		e. approximation of the irrational number pi.							X				
		1.4.2K. Performs and explains these computational procedures (2.4.K1a) \$:	X	X	X	X	X	X	X	X	X	X	X
		a. adds and subtracts decimals from ten millions place; through hundred thousandths place ;	X	X	X	X	X	X	X	X	X	X	X
		b. multiplies and divides a 4-digit number by a two-digit number using numbers from thousands place through thousandths place ;	X	X	X	X	X	X	X	X	X	X	X
		c. multiplies and divides using numbers from thousands place through thousandths place by 10; 100; 1,000; .1; .01; .001; or single-digit multiples of each ;	X	X	X	X	X	X	X	X	X	X	X
		d. adds, subtracts, multiplies and divides fractions and expresses answers in simplest form ;	X	X	X	X	X	X	X	X	X	X	X
		e. adds, subtracts, multiplies, and divides integers;	X	X	X	X	X	X	X	X	X	X	X
		f. uses basic order of operations (evaluates within grouping symbols, evaluates powers to the second or third power, multiplies or divides in order from left to right, then adds or subtracts in order from left to right) using whole numbers;	X	X	X	X	X	X	X	X	X	X	X
		g. simplifies positive rational numbers raised to positive whole number powers;	X	X	X	X	X	X	X	X	X	X	X
		h. combines like terms of a first degree algebraic expression.	X	X	X	X	X	X	X	X	X	X	
		1.4.3K. Recognizes, describes, and uses different ways to express the same computational procedures.	X		X	X	X						X
2--ALGEBRA	The student uses algebraic concepts and procedures in a variety of situations.												
	1--Patterns	The student recognizes, describes, extends, develops, and explains the general rule of a pattern in a variety of situations.											
		2.1.1K. Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes:	X	X	X	X	X	X	X	X	X	X	X
		a. counting numbers including perfect squares, cubes, and factors and multiples (number theory) (2.4.K1a),	X	X	X	X	X	X	X	X	X	X	X

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		b. positive rational numbers including arithmetic and geometric sequences (arithmetic: a sequence of numbers in which the difference of two consecutive numbers is the same, geometric: a sequence of numbers in which each succeeding term is obtained by multiplying the preceding term by the same number) (2.4.K1a)	X	X	X	X	X	X	X	X	X	X	X
		c. geometric figures (2.4.K1f)	X	X	X	X	X	X	X	X	X	X	X
		d. measurements (2.4.K1a)	X	X	X	X	X	X	X	X	X	X	X
		e. things related to daily life (2.4.K1a) \$	X	X	X	X	X	X	X	X	X	X	X
		2.1.2K. Generates a pattern (2.4.K1a).		X	X	X	X						
		2.1.2A. Recognizes the same general pattern presented in different representations [numeric (list or table), visual (picture, table or graph), and written] (2.4.A1a,f,j-k) \$.		X	X	X	X						
		2.1.3K. Extends a pattern when given a rule of one or two simultaneous (addition, subtraction, multiplication, division) between consecutive terms (2.4.K1a)		X	X	X	X	X	X	X	X	X	X
	2--Variables, Equations, and Inequalities	Variable, Equations, and Inequalities - The student uses variables, symbols, rational numbers, and simple algebraic expressions in one variable to solve linear equations and inequalities in a variety of situations.											
		2.2.1A. Represents real-world problems using variables and symbols to write linear expressions, one- or two-step equations, or one-step inequalities (2.4.A1e) \$		X	X	X	X	X	X	X	X	X	X
		2.2.2A. Solves real world problems with one-step or two-step linear equations in one variable with whole number coefficients and constants and positive rational solutions intuitively and analytically (2.4.A1e) \$							X				
		2.2.4A. Explains the mathematical reasoning that was used to solve a real-world problem using a one- or two-step linear equation (2.4.A1e) \$							X				
	3--Functions	The student recognizes, describes, and analyzes constant and linear relationships in a variety of situations.											
		2.3.1A. Represents a variety of constant and linear relationships using written and oral descriptions of the rule, tables, graphs, and when possible symbolic notation (2.4.A13-g,k) \$.		X	X	X	X						X
		2.3.2A. Interprets, describes and analyzes the mathematical relationships of numerical, tabular, and graphical representations (2.4.A1k) \$		X	X	X	X	X	X	X	X	X	X

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	4--Models	The student generates and uses mathematical models to represent and justify mathematical relationships found in a variety of situations.											
		2.4.1K. Knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:	X	X	X	X	X	X	X	X	X	X	X
		a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate grids) to model computational procedures, algebraic relationships, and mathematical relationships and to solve equations (1.1.K1-5, 1.2.K1-4,1.3.K1-4, 1.4.K5, 2.1.K1a-b, 2.1.K1e, 2.1.K2-4, 2.2.K1-3, 2.2.K5-6, 2.3.K1, 3.1.K9, 3.2.K1-3, 3.2.K1-3, 3.2.K9, 3.3.K1-4, 3.4.K1,4.2.K4-6) \$;	X	X	X	X	X	X	X	X	X	X	X
		b. factor trees to find least common multiple and greatest common factor and to model prime factorization (1.4.K5)	X	X	X	X	X	X	X	X	X	X	X
		c. equations and inequalities to model numerical relationships (2.2.K5-6, 2.2.K6-8, 3.2.K11) \$	X	X	X	X	X	X	X	X	X	X	X
		d. function tables to model numerical and algebraic relationships (2.2.K1-3, 2.2.K5a-c,2.3.K1-2, 2.3.K4) \$	X	X	X	X	X	X	X	X	X	X	X
		e. coordinate planes to model relationships between ordered pairs and linear equations (2.3.K1, 2.3.K3-5, 3.3.K1-3, 3.4.K1, 3.4.K3-4)	X	X	X	X	X	X	X	X	X	X	X
		f. two- and three-dimensional geometric models (geoboards, dot paper, nets or solids) to model perimeter, area, volume, and surface area (3.2.K1-2, 3.2.K4-6, 3.2.K8, 3.2.K10, 3.3.K1-3)	X	X	X	X	X	X	X	X	X	X	X
		g. geometric models (spinners, targets or number cubes), process models (pictures, diagrams, or coins) to model probability (4.1.K1, 4.1.K4) ;	X	X	X	X	X	X	X	X	X	X	X
		h. frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single stem-and -leaf plots, scatter plots , and box and whisker plots to organize and display data (1.2.K1, 4.2.K1, 4.2.K4-7);	X	X	X	X	X	X	X	X	X	X	X
		i. Venn diagrams to sort data and to show relationships	X	X	X	X	X	X	X	X	X	X	X
		2.4.1A. Recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:	X	X	X	X							

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		a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate grids) to model computational procedures, algebraic relationships, and mathematical relationships and to solve equations (1.1.a1, 1.2.A1-2, 1.3.A1-4, 1.4.A1, 2.1.A1-2, 3.1.A1, 3.2.A1a, 3.2.A1d, 3.2.A1f, 3.2.A2, 3.3.A1, 4.2.A4) \$;		X	X	X	X						
		b. equations and inequalities to model numerical relationships (2.2.A1-4, 3.2.A1e) \$		X	X	X	X						
		c. function tables to model numerical and algebraic relationships (2.1.A1-2, 2.3.A1-2) \$		X	X	X	X						
		d. coordinate planes to model relationships between ordered pairs and linear equations (2.3.A1-2, 3.4.A1)		X	X	X	X						
		e. two- and three-dimensional geometric models (geoboards, dot paper, nets or solids) to model perimeter, area, volume, and surface area (3.2.A1b-c, 3.2.A1e-f, 3.2.A2, 3.4.A1)		X	X	X	X						
		f. geometric models (spinners, targets or number cubes), process models (pictures, diagrams, or coins) to model probability (4.1.K1, 4.1.K4) ;		X	X	X	X						
		g. frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single stem-and -leaf plots, scatter plots , and box and whisker plots to describe, interpret, and analyze data (4.2.A1);		X	X	X	X						
		h. Venn diagrams to sort data and to show relationships		X	X	X	X						
		2.4.3A. Uses the mathematical modeling process to make inferences about real-world situations when the mathematical model used to represent the situation is given .		X	X	X	X						X
3--GEOMETRY	The student uses geometric concepts and procedures in a variety of situations.												
	1--Geometric Figures and their Properties	The student recognizes geometric figures and compares their properties in a variety of situations.											
		3.1.1K. Recognizes and compares properties two- and three-dimensional figures using concrete objects, constructions, drawings, appropriate terminology, and appropriate technology (2.4.K1f).			X								
		3.1.1A. Solves real-world problems by applying the properties of (2.4.A1e):			X								
		a. plane figures (regular and irregular polygons through 10 sides, circles, and semicircles) and the line(s) of symmetry,			X								

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		b. solid (cubes, rectangular prisms, cylinders, cones, spheres, triangular prisms) emphasizing faces, edges, vertices, and bases;			X								
		3.1.3K. Identifies angle and side properties of triangles and quadrilaterals:			X								
		a. sum of the interior angles of any triangle is 180			X								
		b. sum of the interior angles of any quadrilateral is 360			X								
		c. parallelograms have opposite sides that are parallel and congruent			X								
		d. rectangles have angles of 90, sides may or may not be equal			X								
		e. rhombi have all sides equal in length, angles may or may not be equal			X								
		f. squares have angles of 90, all sides congruent			X								
		g. trapezoids have one pair of opposite sides parallel and the other pair of opposites sides are not parallel			X								
		3.1.4K. Identifies and describes:			X								
		a. the altitude and base of a rectangular prism and triangular prism			X								
		b. the radius and diameter of a cylinder			X								
		3.1.5K. Identifies corresponding parts of similar and congruent triangles and quadrilaterals.			X								
		3.1.6K. Uses symbols for right angle within a figure, parallel, perpendicular, and triangle to describe geometric figures			X								
		3.1.7K. Classifies triangles as:			X								
		a. right, obtuse, acute or equiangular			X								
		b. scalene, isosceles, or equilateral			X								
	2--Measurement and Estimation	The student estimates, measures, and uses measurement formulas in a variety of situations.											
	3--Transformational Geometry	The student recognizes and performs transformations on two- and three-dimensional geometric figures in a variety of situations.											
	4--Geometry from an Algebraic Perspective	The student relates geometric concepts to a number line and a coordinate plane in a variety of situations.											
		3.4.2K. Uses all four quadrants of a coordinate plane to (2.4.K1e) :										X	

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		a. identify in which quadrant or on which axis a point lies when given the coordinates of a point.									X		
		b. plot points .									X		
		c. identify points.									X		
		d. list through five ordered pairs of a given line.									X		
4--DATA	The student uses concepts and procedures of data analysis in a variety of situations.												
	1--Probability	The student applies the concepts of probability to draw conclusions, generate convincing arguments, and make predictions and decisions including the use of concrete objects in a variety of situations.											
	2--Statistics	The student collects, organizes, displays, and explains numerical (rational numbers) and non-numerical data sets in a variety of situations with a special emphasis on measures of central tendency.											
		4.2.1K.. Organizes displays and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1h) \$:	X	X	X	X							X
		a. frequency tables.	X	X	X	X							X
		b. bar, line and circle graphs	X	X	X	X							X
		c. Venn diagrams or other pictorial displays.	X	X	X	X							X
		d. charts and tables .	X	X	X	X							X
		e. single stem-and-leaf plots (single).	X	X	X	X							X
		f. scatter plots .	X	X	X	X							X
		g. box-and-whiskers plots.	X	X	X	X							X

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Gr. 8 Math Standards	Benchmark	Indicators	Alternative Energy	Applied Physics	CADD	Cell Structures	CNC Manufacturing	Flight Technology	Forces	Forensic Science	Robots	Video Production	Computer Graphics
1--NUMBERS & COMPUTATION	The student uses numerical and computational concepts and procedures in a variety of situations.												
	1--Number Sense	The student demonstrates number sense for real numbers and simple algebraic expressions in a variety of situations.											
		1.1.1A Generates and/or solves real world problems using equivalent representations of rational numbers and simple algebraic expressions (2.4.A1a) \$	X	X	X	X	X	X	X	X	X	X	X
	2--Number Systems and their Properties	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties; and extends these properties to algebraic expressions.											
		1.2.1K. Explains and illustrates the relationships between the subsets of the real number system [natural (counting) numbers, whole numbers, integers, rational numbers, irrational numbers] using mathematical models (2.4.K1a)	X	X	X	X	X	X	X	X	X	X	X
	3--Estimation	The student uses computational estimation with real numbers in a variety of situations.											
		1.3.1K. Estimates real-number quantities using various computational methods including mental math, paper and pencil, concrete objects, and/or appropriate technology (2.4.K1a) \$.	X	X	X	X	X	X	X			X	X
		1.3.2K. Uses various estimation strategies and explains how they were used to estimate real number quantities and simple algebraic expressions \$.	X	X	X	X	X	X	X	X	X	X	X
	4--Computation	The student models, performs, and explains computation with rational numbers, the irrational number pi, and algebraic expressions in a variety of situations.											
		1.4.1K. Computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete materials, and appropriate technology (2.4.K1a) \$.	X	X	X	X	X	X	X	X	X	X	X
		1.4.1A. Generates and/or solves one- and two-step real-world problems using computational procedures and mathematical concepts (2.4.A1a) with:	X	X	X	X	X	X	X	X	X	X	X
		a. rational numbers	X	X	X	X	X	X	X	X	X	X	X

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		b. the irrational number pi as an approximation		X	X	X	X	X	X	X	X	X	X
		c. application of percents \$		X	X	X	X	X	X	X	X	X	X
		1.4.2K. Performs and explains these computational procedures with rational numbers (2.4.K1a):		X	X	X	X	X	X	X	X	X	X
		a. addition, subtraction, multiplication, and division of integers \$		X	X		X	X	X	X	X	X	X
		b. an order of operations (<i>evaluates within grouping symbols, evaluates powers to the second or third power, multiplies or divides in order from left to right, then adds or subtracts in order from left to right</i>)		X	X		X	X	X	X	X	X	X
		c. approximation of roots of numbers using calculators		X	X		X	X	X	X	X	X	X
		d. multiplication or division to find \$:		X			X	X	X	X	X	X	X
		i. a percent of a number		X			X	X	X	X	X	X	X
		ii. Percent of increase and decrease		X			X	X	X	X	X	X	X
		iii. Percent of one number is of another number		X			X	X	X	X	X	X	X
		iv. A number when a percent of the number is given		X			X	X	X	X	X	X	X
		e. addition of polynomials		X			X	X	X	X	X	X	X
		f. simplifies algebraic expression in one variable by combining like terms or using the distributive property (2.4.K1a)		X			X	X	X	X	X	X	X
		1.4.3K. Finds factor and common factors of simple monomial expressions (2.4.K1d)		X	X	X	X	X	X	X	X	X	
2--ALGEBRA	The student uses algebraic concepts and procedures in a variety of situations.												
	1--Patterns	The student recognizes, describes, extends, develops, and explains the general rule of a pattern from a variety of situations.											
		2.1.1K. Identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes :			X								
		a. counting numbers including perfect squares, cubes, and factors and multiples with positive rational numbers (number theory)			X								

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		b. rational numbers including arithmetic and geometric sequences (arithmetic: a sequence of numbers in which the difference of two consecutive numbers is the same, geometric: a sequence of numbers in which each succeeding term is obtained by multiplying the preceding term by the same number) (2.4.K1a)			X								
		c. geometric figures			X								
		d. measurements \$			X								
		e. things related to daily life \$			X								
		f. variable and simple expressions			X								
		2.1.2K. Generates and explains a pattern.			X								
	2--Variables, Equations, and Inequalities	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations.											
	3--Functions	The student recognizes, describes, and analyzes constant, linear, and nonlinear relationships in a variety of situations.											
		2.3.2A. Interprets, describes and analyzes the mathematical relationships of numerical, tabular, and graphical representations (2.4.A1f) \$		X	X	X	X	X	X	X	X	X	X
		2.3.3K. Explains the concepts of slope and x- and y- intercepts of a line (2.4.K1h)			X								
4--Models	The student generates and uses mathematical models to represent and justify mathematical relationships found in a variety of situations.												
3--GEOMETRY	The student uses geometric concepts and procedures in a variety of situations.												
	1--Geometric Figures and their Properties	The student recognizes geometric figures and compares their properties in a variety of situations.											
	2--Measurement and Estimation	The student estimates, measures, and uses geometric formulas in a variety of situations.											
		3.2.2K. Selects and uses measurement tools, units of measure, and a level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, surface area, and angle measurements (2.4.K1a) \$			X								

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	3--Transformational Geometry	The student recognizes and applies transformations on geometric figures in a variety of situations.											
		3.3.1K. Identifies, describes, and performs single and multiple transformations (reflection, rotation, translation, reduction (contraction/shrinking), enlargement (magnification/growing)) on a two-dimensional figure			X								
	4--Geometry from an Algebraic Perspective	The student uses an algebraic perspective to examine the geometry of two-dimensional figures in a variety of situations.											
		3.4.1K. Uses the coordinate plane to (2.4.K1e) :			X							X	
		a. list several ordered pairs on the graph of a line and finds the slope of the line			X							X	
		b. recognize that ordered pairs that lie on the graph of an equation are solutions to that equation			X							X	
		c. recognize that points that do not lie on the graph of an equation are not solutions to that equation			X							X	
		d. determine the length of a side of a figure drawn on a coordinate plane with vertices having the same x- or y- coordinates			X							X	
		e. solve simple systems of linear equations			X							X	
		3.4.3K. Examines characteristics of two-dimensional figures on a coordinate plane using various methods including mental math, paper and pencil, concrete objects, and graphing utilities or other appropriate technology (2.4.A1g)			X							X	
4--DATA	The student uses concepts and procedures of data analysis in a variety of situations.												
	1--Probability	The student applies the concepts of probability to draw conclusions, generate convincing arguments, and make predictions and decisions including the use of concrete objects in a variety of situations.											
	2--Statistics	The student collects, organizes, displays, explains, and interprets numerical (rational) and non-numerical data sets in a variety of situations.											

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		4.2.1K.. Organizes displays and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized and accurate manner including a title, labels, categories, and rational number intervals using these data displays (2.4.K1i) \$:		X	X	X	X	X	X	X	X	X	X
		a. frequency tables		X	X	X	X	X	X	X	X	X	X
		b. bar, line and circle graphs		X	X	X	X	X	X	X	X	X	X
		c. Venn diagrams or other pictorial displays		X	X	X	X	X	X	X	X	X	X
		d. charts and tables		X	X	X	X	X	X	X	X	X	X
		e. single stem-and-leaf plots (single and double)		X	X	X	X	X	X	X	X	X	X
		f. scatter plots		X	X	X	X	X	X	X	X	X	X
		g. box-and-whiskers plots		X	X	X	X	X	X	X	X	X	X
		h. histograms		X	X	X	X	X	X	X	X	X	X

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Gr. 7 Science Standards	Benchmark	Indicators	Alternative Energy	Applied Physics	CADD	Cell Structures	CNC	Manufacturing	Flight Technology	Forces	Forensic Science	Robots	Video Production	Computer Graphics	
1--Science as Inquiry	The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.		X												
▲ Recommended Grade 7 Assessed Indicator	1--Scientific Inquiry	Demonstrate abilities necessary to do the processes of scientific inquiry.	X												
		1.1.1. ▲ Identifies questions that can be answered through scientific investigations.	X	X		X					X				
		1.1.2. ▲ Designs and conducts scientific investigations safely using appropriate tools, mathematics, technology, and techniques to gather, analyze, and interpret data.	X	X		X									
		1.1.3. ▲ Identifies the relationship between evidence and logical conclusions.				X						X			
		1.1.4. ▲ Communicates scientific procedures, results and explanations.	X	X		X					X	X			
		2--Application	Apply different kinds of investigations to different questions.												
	3--Analyze	Analyze how science advances through the interaction of new ideas, scientific investigations, skepticism, and examinations of evidence of varied explanations.													
2--Physical Science	The student will apply process skills to develop and understanding of physical science including: properties, changes of properties of matter, motion and forces, and transfer of energy.														
3--Life Science	The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.														
	1--Structures and Functions of Organisms	Model structures of organisms and relate functions to the structures.													
		3.1.1. Understands the cell theory; that all organisms are composed of one or more cells, cells that are the basic unit of life, and that cells come from other cells.				X									
		3.1.2. ▲ Relates the structure of cells, organs, tissues, organ systems, and whole organisms to their functions.				X									
	2--Reproduction and Heredity	Understand the role of reproduction and heredity for all living things.													

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		3.2.1. ▲ Differentiates between asexual and sexual reproduction of organisms.				X								
		3.2.2. ▲ Understands how hereditary information of each cell is passed from one generation to the next.				X								
		3.2.3. Infers that the characteristics of an organism result from heredity and interactions with the environment.				X								
	3--Homeostasis	Describe homeostasis, the regulations and balance of internal conditions in response to a changing external environment.												
		3.3.1. ▲ Understands that internal and/or environmental conditions affect an organism's behavior and/or response in order to maintain and regulate stable internal conditions to survive in a continually changing environment.				X								
		3.3.2. Recognizes the survival of all organisms requires the ingestion of materials, the intake and release of energy, growth, release of wastes, and responses to environmental changes.												
	4--Ecosystem Interactions	Identify and relate interactions of populations of organisms within an ecosystem.												
5--Survival & Extinction	Observe the diversity of living things and relate their adaptations to their survival or extinction.													
		3.5.1. Concludes that species of animals, plants, and microorganisms may look dissimilar on the outside, but have similarities in internal structures, developmental characteristics, chemical processes, and genomes.				X								
4--Earth & Space Science	The student will apply process skills to explore and develop and understanding of the structure of the Earth system, Earth's history, and Earth in the solar system.													
5--Science & Technology	The student will demonstrate abilities of technological design and understanding about science and technology.													
	1--Technological Design	Demonstrate abilities of technological design.												
	2--Similarities, Differences, Relationships	Develop understandings of the similarities, differences, and relationships in science and technology.												
		5.2.3. Identifies contributions to science and technology by many people and many cultures.	X			X		X	X			X		

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6--Science in Personal and Environmental Perspectives	The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.														
	2--Impact of Human Activity	Understand the impact of human activity on resources and environment.	X												
		6.2.1 ▲ Investigates the effects of human activities on the environment and bases decisions on knowledge of benefits and risks.	X												
	3--Natural Hazards	Understand that natural hazards are dynamic examples of earth processes which cause us to evaluate risks.	X												
		6.3.1. Recognizes patterns of natural processes that may cause natural hazards and human activities that may contribute to natural hazards.	X												
7--History & Nature of Science	The student will examine and develop an understanding of science as a historical human endeavor.														
	1--Scientific Habits of Mind	Develop scientific habits of mind.													
		7.1.1. Practices intellectual honesty, demonstrates skepticism appropriately, displays open-mindedness to new ideas, and bases decisions on evidence.										X			
	2--Science Contributions & History	Research contributions to science throughout history.													
		7.2.1. ▲ Recognizes that new knowledge leads to new questions and new discoveries, replicates historic experiments to understand principles of science, and relates contributions of men and women to the fields of science.						X				X	X	X	

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Gr. 8 Science Standards	Benchmark	Indicators	Alternative Energy	Applied Physics	CADD	Cell Structures	CNC	Manufacturing	Flight Technology	Forces	Forensic Science	Robots	Video Production	Computer Graphics
1--Science as Inquiry	The student will develop the abilities to do scientific inquiry and develop an understanding of scientific inquiry.													
▲ Recommended High School Assessed	1--Scientific Inquiry	Demonstrate abilities necessary to do the processes of scientific inquiry.												
		1.1.3. ▲ Actively engages in using technological tools and mathematics in their own scientific investigations.	X			X				X				
		1.1.4. ▲ Actively engages in conducting an inquiry, formulating and revising his or her scientific explanations and models (physical, conceptual or mathematical) using logic and evidence, and recognizing that potential alternative explanations and models should be considered.	X			X				X				
		1.1.5. Actively engages in communicating and defending the design, results, and conclusion of his/her investigation.	X			X				X				
2A--Physical Science, Chemistry	The student will develop an understanding of the structure of atoms, compounds, chemical reactions, and the interactions of energy and matter.													
	1--Structures of Atoms	Understand the structure of the atom.												
2B--Physical Science, Physics	The student will develop an understanding of the structure of atoms, compounds, chemical reactions, and the interactions of energy and matter.													
	1--Force and Motion	Understand the relationships between force and motion.												
		2B.1.1. ▲ Understands Newton's Laws and the kinematic variables of time, position, velocity, and acceleration can be used to describe the position and motion of particles.								X				
3--Life Science	The student will develop an understanding of the cell, molecular basis of heredity, biological evolution, interdependence of organisms, matter, energy, and organization in living systems, and the behavior of organisms.													
	4--Organism Interdependence	Understand the interdependence of organisms and their interaction with the physical environment.												

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4--Earth & Space Science	The student will develop an understanding of energy in the Earth system, geochemical cycles, the formation and organization of the Earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.													
	1--Dynamic Earth	Develop an understanding of the sources of energy that power the subsystems and cycles of dynamic Earth: the geosphere, hydrosphere, atmosphere, and biosphere.												
	2--Earth Origin	Develop an understanding of the origin and development of the dynamic Earth system.												
	3--Solar System	Develop an understanding of dynamics of our solar system.												
	4--Organization of Universe	Develop an understanding of the organization of the universe and its development.												
5--Science & Technology	The student will develop understandings about the relationship between science and technology.													
	1--Technology as Applied Science	Develop an understanding that technology is applied science.												
		5.1.1. ▲ Understands technology is the application of scientific knowledge for functional purposes.	X						X		X			
		5.1.2. Understands creativity, imagination, and a broad scientific knowledge base are required to produce useful results.	X						X		X			
6--Science in Personal and Environmental Perspectives	The student will develop an understanding of personal and community health, population growth, natural resources, environmental quality, natural and human-induced hazards, and science and technology in local, national, and global settings.													
	1--Health	Develop an understanding of the overall functioning of human systems and their interaction with the environment in order to understand specific mechanisms and processes related to health issues.												
	2--Population Growth	Demonstrate an understanding of population growth.												

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	3--Environmental Quality	Understand that human populations use natural resources and influence environmental quality.											
		6.3.2. Understands Earth does not have infinite resources.	X										
	4--Hazards	Understand the effect of natural and human-influenced hazards.											
	5--Society	Develop an understanding of the relationship between science, technology, and society.											
		6.5.1. Understands progress in science and technology can be affected by social issues and challenges. Science and technology indicate what can happen, not what should happen.	X	X				X		X			
7--History & Nature of Science	The student will develop understanding of science as a human endeavor, the nature of scientific knowledge, and historical perspectives.												
	1--Human Endeavor	Develop an understanding that science is a human endeavor that uses models to describe and explain the physical universe.											
	2--Scientific Knowledge	Develop an understanding of the nature of scientific knowledge.											
		7.2.2. Understands scientific knowledge begins with empirical observations, which are the data (also called facts or evidence) upon which further scientific knowledge is built.		X		X							
		7.2.3. Understands scientific knowledge consists of hypotheses, inferences, laws, and theories.		X		X					X		
		7.2.4. Understands a testable hypothesis or inference must be subject to confirmation by empirical evidence.		X		X					X		
	3--History	Understand science from historical perspectives.											
		7.3.1. Demonstrates an understanding of the history of science.	X			X		X	X	X			