Pushing the Envelope			
2004 Mathematics			
Curriculum Standards			
Kansas Mathematics			
Grade 5			
Activity/Lesson	**State**	**Standards**	
History of Aviation Propulsion (pgs. 5-9)	KS	MA.5.3.2.K1	The student estimates, measures, and uses measurement formulas in a variety of situations and determines and uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, and area using standard and nonstandard units of measure.
History of Aviation Propulsion (pgs. 5-9)	KS	MA.5.3.2.K2.d	The student estimates, measures, and uses measurement formulas in a variety of situations and selects, explains the selection of, and uses measurement tools, units of measure, and degree of accuracy appropriate for a given situation to measure length, width, weight, volume, temperature, time, perimeter, and area using time including elapsed time
Chemistry (pgs. 25-41)	KS	MA.5.3.2.K1	The student estimates, measures, and uses measurement formulas in a variety of situations and determines and uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, and area using standard and nonstandard units of measure.
Physics and Math (pgs. 43-63)	KS	MA.5.2.2.K1	The student uses variables, symbols, whole numbers, and algebraic expressions in one variable to solve linear equations in a variety of situations and explains and uses variables and symbols to represent unknown whole number quantities from 0 through 1,000 and variable relationships.
Physics and Math (pgs. 43-63)	KS	MA.5.2.2.K4	The student uses variables, symbols, whole numbers, and algebraic expressions in one variable to solve linear equations in a variety of situations and recognizes ratio as a comparison of part-to-part and part-to-whole relationships, e.g., the relationship between the number of boys and the number of girls (part-to-part) or the relationship between the number of girls to the total number of students in the classroom (part-to-whole).
Pushing the Envelope			
2004 Mathematics			
Curriculum Standards			
Kansas Mathematics			
Grade 6			
Activity/Lesson	**State**	**Standards**	

History of Aviation Propulsion (pgs. 5-9)	KS	MA.6.1.1.K1	The student demonstrates number sense for rational numbers and simple algebraic expressions in one variable in a variety of situations and knows, explains, and uses equivalent representations for rational numbers expressed as fractions, terminating decimals, and percents; positive rational number bases with whole number exponents; time; and money.
History of Aviation Propulsion (pgs. 5-9)	KS	MA.6.2.1.K1.e	identifies, states, and continues a pattern presented in various formats including numeric (list or table), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes include (things related to daily life, e.g., time (a full moon every 28 days), tide, calendar, traffic, or appropriate topics across the curriculum)
Types of Engines (pgs. 11-23)	KS	MA.6.1.2.K3.f	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 and uses and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (substitution property (one name of a number can be substituted for another name of the same number), e.g., if a = 3 and a + 2 = b, then 3 + 2 = b)
Chemistry (pgs. 25-41)	KS	MA.6.1.2.K3.f	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 and uses and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (substitution property (one name of a number can be substituted for another name of the same number), e.g., if a = 3 and a + 2 = b, then 3 + 2 = b)
Chemistry (pgs. 25-41)	KS	MA.6.3.2.K1	The student estimates, measures, and uses measurement formulas in a variety of situations and determines and uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, and area using standard and nonstandard units of measure.

Chemistry (pgs. 25-41)	KS	MA.6.3.2.K2	The student estimates, measures, and uses measurement formulas in a variety of situations and selects, explains the selection of, and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, and angle measurements.
Physics and Math (pgs. 43-63)	KS	MA.6.1.2.K3.f	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 and uses and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (substitution property (one name of a number can be substituted for another name of the same number), e.g., if a = 3 and a + 2 = b, then 3 + 2 = b)
Physics and Math (pgs. 43-63)	KS	MA.6.2.2.K1	The student uses variables, symbols, positive rational numbers, and algebraic expressions in one variable to solve linear equations and inequalities in a variety of situations and explains and uses variables and/or symbols to represent unknown quantities and variable relationships, e.g., x < 2.
Physics and Math (pgs. 43-63)	KS	MA.6.2.2.K5	The student uses variables, symbols, positive rational numbers, and algebraic expressions in one variable to solve linear equations and inequalities in a variety of situations and knows and uses the relationship between ratios, proportions, and percents and finds the missing term in simple proportions where the missing term is a whole number e.g., 1/2 = x/4, 2/3 = 4/x, 1/4 = x/100.
Physics and Math (pgs. 43-63)	KS	MA.6.2.3.K2	The student recognizes, describes, and analyzes linear relationships in a variety of situations and finds the values and determines the rule with one operation using a function table (input/output machine, T-table).
Pushing the Envelope			
2004 Mathematics			
Curriculum Standards			
Kansas Mathematics			
Grade 7			
Activity/Lesson	**State**	**Standards**	

History of Aviation Propulsion (pgs. 5-9)	KS	MA.7.1.1.K1	The student demonstrates number sense for rational numbers, the irrational number pi, and simple algebraic expressions in one variable in a variety of situations and 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, e.g., 253,000 is equivalent to 2.53 x 10 to the 5th power or x + 5x is equivalent to 6x.
History of Aviation Propulsion (pgs. 5-9)	KS	MA.7.3.2.K1	The student estimates, measures, and uses measurement formulas in a variety of situations and determines and uses rational number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, and area using standard and nonstandard units of measure.
History of Aviation Propulsion (pgs. 5-9)	KS	MA.7.3.2.K2	The student estimates, measures, and uses measurement formulas in a variety of situations and selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, and angle measurements.
Types of Engines (pgs. 11-23)	KS	MA.7.1.2.K3.d	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 and names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (substitution property (one name of a number can be substituted for another name of the same number), e.g., if a = 2, then 3a = 3 x 2 = 6)
Types of Engines (pgs. 11-23)	KS	MA.7.2.2.K8	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 and evaluates simple algebraic expressions using positive rational numbers, e.g., if x = 3/2, y = 2, then 5xy + 2 = 5(3/2)(2) + 2 = 17.

Chemistry (pgs. 25-41)	KS	MA.7.1.2.K3.d	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 and names, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (substitution property (one name of a number can be substituted for another name of the same number), e.g., if a = 2, then 3a = 3 x 2 = 6)
Chemistry (pgs. 25-41)	KS	MA.7.2.2.K1	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 and knows and explains that a variable can represent a single quantity that changes, e.g., daily temperature.
Chemistry (pgs. 25-41)	KS	MA.7.3.2.K2	The student estimates, measures, and uses measurement formulas in a variety of situations and selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, and angle measurements.
Physics and Math (pgs. 43-63)	KS	MA.7.1.1.K1	The student demonstrates number sense for rational numbers, the irrational number pi, and simple algebraic expressions in one variable in a variety of situations and 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, e.g., 253,000 is equivalent to 2.53 x 10 to the 5th power or x + 5x is equivalent to 6x.
Physics and Math (pgs. 43-63)	KS	MA.7.2.2.K7	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 and knows the mathematical relationship between ratios, proportions, and percents and how to solve for a missing term in a proportion with positive rational number solutions and monomials, e.g., 5/6 = 2/x.

Physics and Math (pgs. 43-63)	KS	MA.7.2.2.K8	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 and evaluates simple algebraic expressions using positive rational numbers, e.g., if x = 3/2, y = 2, then 5xy + 2 = 5(3/2)(2) + 2 = 17.
Physics and Math (pgs. 43-63)	KS	MA.7.2.4.K1.h	The student generates and uses mathematical models to represent and justify mathematical relationships found in a variety of situations and knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include (two- and three-dimensional geometric models (geoboards, dot paper, nets or solids) to model perimeter, area, volume, and surface area, and properties of two- and three-dimensional)
Rocket Activity (pgs. 69-75)	KS	MA.7.2.2.K8	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 and evaluates simple algebraic expressions using positive rational numbers, e.g., if x = 3/2, y = 2, then 5xy + 2 = 5(3/2)(2) + 2 = 17.
Pushing the Envelope			
2004 Mathematics			
Curriculum Standards			
Kansas Mathematics			
Grade 8			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	KS	MA.8.1.2.K3.a	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties; and extends these properties to algebraic expressions and ames, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (commutative, associative, distributive, and substitution properties [commutative: a + b = b + a and ab = ba; associative: a + (b + c) = (a + b) + c and a(bc) = (ab)c; distributive: a(b + c) = ab + ac; substitution: if a = 2, then 3a = 3 x 2 = 6])
Types of Engines (pgs. 11-23)	KS	MA.8.2.2.K6	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations and evaluates formulas using substitution.

Chemistry (pgs. 25-41)	KS	MA.8.1.2.K3.a	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties; and extends these properties to algebraic expressions and ames, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (commutative, associative, distributive, and substitution properties [commutative: a + b = b + a and ab = ba; associative: a + (b + c) = (a + b) + c and a(bc) = (ab)c; distributive: a(b + c) = ab + ac; substitution: if a = 2, then 3a = 3 x 2 = 6])
Chemistry (pgs. 25-41)	KS	MA.8.2.2.K6	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations and evaluates formulas using substitution.
Chemistry (pgs. 25-41)	KS	MA.8.3.2.K1	The student estimates, measures, and uses geometric formulas in a variety of situations and determines and uses rational number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, area, and surface area using standard and nonstandard units of measure.
Chemistry (pgs. 25-41)	KS	MA.8.3.2.K2	The student estimates, measures, and uses geometric formulas in a variety of situations and selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate real number representations for length, weight, volume, temperature, time, perimeter, area, surface area, and angle measurements.
Physics and Math (pgs. 43-63)	KS	MA.8.1.1.K1	The student demonstrates number sense for real numbers and simple algebraic expressions in a variety of situations and nows, explains, and uses equivalent representations for rational numbers and simple algebraic expressions including integers, fractions, decimals, percents, and ratios; rational number bases with integer exponents; rational numbers written in scientific notation with integer exponents; time; and money.

Physics and Math (pgs. 43-63)	KS	MA.8.1.2.K3.a	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties; and extends these properties to algebraic expressions and ames, uses, and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (commutative, associative, distributive, and substitution properties [commutative: a + b = b + a and ab = ba; associative: a + (b + c) = (a + b) + c and a(bc) = (ab)c; distributive: a(b + c) = ab + ac; substitution: if a = 2, then 3a = 3 x 2 = 6])
Physics and Math (pgs. 43-63)	KS	MA.8.2.2.K4	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations and knows and describes the mathematical relationship between ratios, proportions, and percents and how to solve for a missing monomial or binomial term in a proportion, e.g., 2/5 = 1/(x+2).
Physics and Math (pgs. 43-63)	KS	MA.8.2.2.K6	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations and evaluates formulas using substitution.
Physics and Math (pgs. 43-63)	KS	MA.8.2.4.K1.h	The student generates and uses mathematical models to represent and justify mathematical relationships found in a variety of situations and knows, explains, and uses mathematical models to represent and explain mathematical concepts, procedures, and relationships. Mathematical models include (two- and three-dimensional geometric models (geoboards, dot paper, nets, or solids) and real-world objects to model perimeter, area, volume, surface area, and properties of two-and three-dimensional figures)
Physics and Math (pgs. 43-63)	KS	MA.8.3.2.K6	The student estimates, measures, and uses geometric formulas in a variety of situations and recognizes how ratios and proportions can be used to measure inaccessible objects, e.g., using shadows to measure the height of a flagpole.
Rocket Activity (pgs. 69-75)	KS	MA.8.2.2.K6	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in a variety of situations and valuates formulas using substitution.
Pushing the Envelope			
2004 Mathematics			
Curriculum Standards			

Kansas Mathematics			
Grades 9-10			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	KS	MA.9-10.1.2.K3.a	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties, and extends these properties to algebraic expressionsnames, uses, and describes these properties with the real number system and demonstrates their meaning including the use of concrete objects (commutative (a + b = b + a and ab = ba), associative [a = (b + c) = (a + b) + c and a(bc) = (ab)c], distributive [a (b + c) = ab + ac], and substitution properties (if a = 2, then 3a = 3 x 2 = 6))
Types of Engines (pgs. 11-23)	KS	MA.9-10.2.2.K1	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in variety of situations and knows and explains the use of variables as parameters for a specific variable situation, e.g., the m and b in y = mx + b or the h, k, and r in $(x – h)^2 + (y – k)^2 = r^2$.
Chemistry (pgs. 25-41)	KS	MA.9-10.1.2.K3.a	The student demonstrates an understanding of the real number system; recognizes, applies, and explains their properties, and extends these properties to algebraic expressionsnames, uses, and describes these properties with the real number system and demonstrates their meaning including the use of concrete objects (commutative (a + b = b + a and ab = ba), associative [a = (b + c) = (a + b) + c and a(bc) = (ab)c], distributive [a (b + c) = ab + ac], and substitution properties (if a = 2, then 3a = 3 x 2 = 6))
Chemistry (pgs. 25-41)	KS	MA.9-10.2.2.K1	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in variety of situations and knows and explains the use of variables as parameters for a specific variable situation, e.g., the m and b in y = mx + b or the h, k, and r in $(x – h)^2 + (y – k)^2 = r^2$.
Chemistry (pgs. 25-41)	KS	MA.9-10.3.2.K2	The student estimates, measures and uses geometric formulas in a variety of situations and selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate real number representations for length, weight, volume, temperature, time, distance, area, surface area, mass, midpoint, and angle measurements.

Chemistry (pgs. 25-41)	KS	MA.9-10.3.2.K4.b	The student estimates, measures and uses geometric formulas in a variety of situations and states, recognizes, and applies formulas for circumference and area of circles
Physics and Math (pgs. 43-63)	KS	MA.9-10.1.1.K1	The student demonstrates number sense for real numbers and algebraic expressions in a variety of situations and knows, explains, and uses equivalent representations for real numbers and algebraic expressions including integers, fractions, decimals, percents, ratios; rational number bases with integer exponents; rational numbers written in scientific notation; absolute value; time; and money, e.g., -4/2 = (-2); a to the -2 power x $b^3 = b^3/a^2$.
Physics and Math (pgs. 43-63)	KS	MA.9-10.2.3.K6	The student analyzes functions in a variety of situations and recognizes how changes in the constant and/or slope within a linear function changes the appearance of a graph.
Physics and Math (pgs. 43-63)	KS	MA.9-10.3.2.K4.b	The student estimates, measures and uses geometric formulas in a variety of situations and states, recognizes, and applies formulas for circumference and area of circles
Physics and Math (pgs. 43-63)	KS	MA.9-10.3.2.K7	The student estimates, measures and uses geometric formulas in a variety of situations and knows, explains, and uses ratios and proportions to describe rates of change $, e.g., miles per gallon, meters per second, calories per ounce, or rise over run.
Rocket Activity (pgs. 69-75)	KS	MA.9-10.2.2.K1	The student uses variables, symbols, real numbers, and algebraic expressions to solve equations and inequalities in variety of situations and knows and explains the use of variables as parameters for a specific variable situation, e.g., the m and b in y = mx + b or the h, k, and r in $(x – h)^2 + (y – k)^2 = r^2$.
Rocket Activity (pgs. 69-75)	KS	MA.9-10.3.2.K4.b	The student estimates, measures and uses geometric formulas in a variety of situations and states, recognizes, and applies formulas for circumference and area of circles