ESSENTIAL CURRICULUM STANDARDS
8th Grade

English/Language Arts: Essential Standards
Reading
- Use word meanings within the appropriate context and show ability to verify those meanings by definition, restatement, example, comparison, or contrast. (8R1.3)
- Use knowledge of Greek, Latin, and Anglo-Saxon roots and affixes to understand content-area vocabulary. (8RCV1.4)
- Analyze idioms, analogies, metaphors, and similes to infer the literal and figurative meanings of phrases. (8R1.1)

Reading Comprehension
- MAKING CONNECTIONS: Make connections to information read in the text (e.g., text to self, text to text, text to world). (8RCV2.10)
- QUESTIONING: Demonstrate comprehension by identifying answers in the text. (8RCV2.13)
- CLARIFYING: Clarify an understanding of texts by creating outlines, logical notes, summaries, or reports. (8RCV2.16)
- INFERRING:Draw inferences, conclusions, or generalizations about text and support them with textual evidence and prior knowledge. (8RCV2.17)
- INFERRING:Distinguish facts, supported inferences, and opinions in text. (8RCV2.18)
- SUMMARIZING AND SYNTHESIZING: Discern main ideas and concepts presented in texts, identifying and assessing evidence that supports those ideas. (8RCV2.19)
- Analyze text that uses proposition and support patterns. (8R2.2)

Literary Response and Analysis
- Determine and articulate the relationship between the purposes and characteristics of different forms of poetry (e.g., ballad, lyric, couplet, epic, elegy, ode, sonnet). (8R3.1)
- Analyze the relevance of the setting (e.g., place, time, customs) to the mood, tone, and meaning of the text. (8R3.4)
- Compare and contrast motivations and reactions of literary characters from different historical eras confronting similar situations or conflicts. (8R3.3)
- Evaluate the structural elements of the plot (e.g., subplots, parallel episodes, climax), the plot's development, and the way in which conflicts are (or are not) addressed and resolved. (8R3.2)
- Identify and analyze recurring themes (e.g. good versus evil) across traditional and contemporary works. (8R3.5)
- Identify significant literary devices (e.g., metaphor, symbolism, dialect, irony) that define a writer's style and use those elements to interpret the work. (8R3.6)

Writing
- Create compositions that establish a controlling impression, have coherent theses, and end with a clear and well-supported conclusion. (8W1.1)
- Establish coherence within and among paragraphs through effective transitions, parallel structures, and similar writing techniques. (8W1.2)
- Support theses or conclusions with analogies, paraphrases, quotations, opinions from authorities, comparisons, and similar devices. (8W1.3)
- Use correct and varied sentence types and sentence openings to present a lively and effective personal style. (8E1.1)
- Edit written manuscripts to ensure that correct grammar is used. (8E1.4)
- Place modifiers properly and use the active voice. (8ECV1.7)
- Identify all parts of speech and types and structure of sentences. (8ECV1.8)
- Write legibly. (8ECV1.9)

- Use correct spelling. (8E1.6)
- Use correct punctuation and capitalization. (8E1.5)
- Use various reference materials (e.g., Reader's Guide, periodical guides) as an aid to writing. (8WCV1.7)
- Achieve an effective balance between researched information and original ideas. (8W1.5)
- Write biographies, autobiographies, short stories, or narratives: (8W2.1)
- Relate a clear, coherent incident, event, or situation by using well-chosen details. (8W2.1a)
    a. Include sensory details and concrete language to develop plot and character. (8WCV2.1d)
    b. Use a range of narrative devices (e.g., dialogue, suspense). (8WCV2.1f)
    c. Reveal the significance of, or the writer's attitude about, the subject. (8W2.1b)
- Write responses to literature. (8W2.2)
    a. Exhibit careful reading and insight in their interpretations. (8W2.2a)
    b. Support judgments through references to the text, other works, other authors, or to personal knowledge. (8W2.2d)
    c. Connect the student's own responses to the writer's techniques and to specific textual references. (8W2.2b)
- Write research reports. (8W2.3)
    a. Define a thesis. (8W2.3a)
    b. Record important ideas, concepts, and direct quotations from significant information sources and paraphrase and summarize all relevant perspectives on the topic, as appropriate. (8W2.3b)
- Write persuasive compositions: (8W2.4)
    a. Include a well-defined thesis (i.e., one that makes a clear and knowledgeable judgment). (8W2.4a)
    b. Present detailed evidence, examples, and reasoning to support arguments, differentiating between facts and opinion. (8W2.4b)
    c. Provide details, reasons, and examples, arranging them effectively by anticipating and answering reader concerns and counterarguments. (8W2.4c)

Listening and Speaking
- Organize information to achieve particular purposes by matching the message, vocabulary, voice modulation, expression, and tone to the audience and purpose. (8LS1.3)
- Use precise language, action verbs, sensory details, appropriate and colorful modifiers, and the active rather than the passive voice in ways that enliven oral presentations. (8LS1.5)
- Use appropriate grammar, word choice, enunciation, and pace during formal presentations. (8LS1.6)

Mathematics: Essential Standards *(8 Standard)*

Number Sense

- Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line. (6NS1.1)
- Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b, a to b, a:b). (6NS1.2)
- Use proportions to solve problems (e.g., determine the value of N if 4/7 = N/21, find the length of a side of a polygon similar to a known polygon).
- Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse. (6NS1.3)
- Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. (6NS1.4)
- Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation. (6NS2.1)
- Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $5 / 8 \div 15 /16 = 5 / 8 \times 16 /15 = 2 /3$). (6NS2.2)
- Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations. (6NS2.3)
- Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction). (6NS2.4)
- Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (7NS1.1)
- Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.(7NS1.2)
- Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (7NS1.3)
- Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions. (7NS1.5)
- Calculate the percentage of increases and decreases of a quantity. (7NS1.6)
- Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest. (7NS1.7)
- Add and subtract fractions by using factoring to find common denominators. (7NS2.2)
- Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why. (7NS2.4)
- Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers. (7NS2.5)
- Write and solve one-step linear equations in one variable. (6AF1.1)
- Write and evaluate an algebraic expression for a given situation, using up to three variables. (6AF1.2)
- Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process. (6AF1.3)
- Solve problems manually by using the correct order of operations or by using a scientific calculator. (6AF1.4)
- Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches). (6AF2.1)
- Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity. (6AF2.2)

- Solve problems involving rates, average speed, distance, and time. (6AF2.3)
- Use variables in expressions describing geometric quantities (e.g., P = 2w + 2l, A = 1 /2 bh, C = _ d-the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively). (6AF3.1)
- Express in symbolic form simple relationships arising from geometry. (6AF3.2)

Algebra and Functions
- Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A). (7AF1.1)
- Use the correct order of operations to evaluate algebraic expressions such as 3(2x + 5)2. (7AF1.2)

Measurement and Geometry
- Understand the concept of a constant such as π; know the formulas for the circumference and area of a circle. (6MG1.1)
- Know common estimates of π(3.14; 22 /7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements. (6MG1.2)
- Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid. (6MG1.3)
- Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. (6MG2.1)
- Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle. (6MG2.2)
- Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle). (6MG2.3)
- Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters). (7MG1.1)
- Construct and read drawings and models made to scale. (7MG1.2)
- Know and understand the Pythagorean Theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement. (7MG3.3)
- Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures. (7MG3.4)

Statistics, Data Analysis, and Probability
- Compute the range, mean, median, and mode of data sets. (6SDP1.1)
- Understand how additional data added to data sets may affect these computations of measures of central tendency. (6SDP1.2)
- Understand how the inclusion or exclusion of outliers affects measures of central tendency. (6SDP1.3)
- Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given text. (6SDP1.4)
- Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample. (6SDP2.1)
- Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population. (6SDP2.2)
- Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached. (6SDP2.3)

- Identify data that represent sampling errors and explain why the sample (and the display) might be biased. (6SDP2.4)
- Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. (6SDP3.1)
- Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven). (6SDP3.2)
- Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, 1-P is the probability of an event not occurring. (6SDP3.3)
- Understand the difference between independent and dependent events. (6SDP3.5)
- Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data. (7SDP1.1)
- Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). (7SDP1.2)

Mathematical Reasoning
- Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. (6MR1.1)
- Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. (7MR1.1)
- Use estimation to verify the reasonableness of calculated results. (7MR2.1)
- Apply strategies and results from simpler problems to more complex problems. (7MR2.2)
- Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning. (7MR2.5)
- Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work. (7MR2.6)
- Make precise calculations and check the validity of the results from the context of the problem. (7MR2.8)
- Evaluate the reasonableness of the solution in the context of the original situation. (7MR3.1)

Mathematics: Essential Standards (8 CP)

Algebra

- Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable. (1.0)
- Students use properties of numbers to demonstrate whether assertions are true or false. (1.1)
- Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents. (2.0)
- Students solve equations involving absolute values. (3.02)
- Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$. (4.0)
- Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step. (5.0)
- Students graph a linear equation and compute the x- and y-intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$). (6.0)
- Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula. (7.0)
- Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets. (9.0)
- Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques. (10.0)
- Students apply basic factoring techniques to second-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. (11.01)
- Students solve a quadratic equation by factoring or completing the square with B equal to a whole even number and A equal to 1. (14.0)
- Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems. (15.0)
- Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions. (16.0)
- Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression. (17.0)
- Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion. (18.0)
- Students know the quadratic formula and are familiar with its proof by completing the square. (19.0)
- Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations. (20.0)
- Students graph quadratic functions and know that their roots are the x-intercepts. (21.0)

Statistics, Data Analysis, and Probability

- Students know the definitions of the mean, median, and mode of a distribution of data and can compute each in particular situations. (6.0)

Mathematics: Essential Standards (8H)
Algebra 1

- Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable. (1.0)
- Students use properties of numbers to demonstrate whether assertions are true or false. (1.1)
- Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents. (2.0)
- Students solve equations and inequalities involving absolute values. (3.01)
- Students solve equations involving absolute values. (3.02)
- Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$. (4.0)
- Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step. (5.0)
- Students graph a linear equation and compute the x- and y-intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$). (6.0)
- Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula. (7.0)
- Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point. (8.01)
- Students understand the concepts of parallel lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point. (8.02)
- Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets. (9.0)
- Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques. (10.0)
- Students apply basic factoring techniques to second-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. (11.01)
- Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. (11.02)
- Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms. (12.0)
- Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques. (13.0)
- Students solve a quadratic equation by factoring or completing the square with B equal to a whole even number and A equal to 1. (14.0)
- Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems. (15.0)
- Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions. (16.0)
- Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression. (17.0)

- Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion. (18 .0)
- Students know the quadratic formula and are familiar with its proof by completing the square. (19.0)
- Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations. (20.0)
- Students graph quadratic functions and know that their roots are the x-intercepts. (21.0)
- Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points. (22.0)
- Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity. (23.0)
- Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. (24.3)

Algebra 2
- Students solve equations and inequalities involving absolute value. (1.0)

Statistics, Data Analysis, and Probability
- Students know the definitions of the mean, median, and mode of a distribution of data and can compute each in particular situations. (6.0)

Science: Essential Standards

Physical Science: Motion
The velocity of an object is the rate of change of its position. As a basis for understanding this concept: (8P1)
   a. Students know position is defined in relation to some choice of a standard reference point and a set of reference directions. (8PIa)
   b. Students know that average speed is the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary. (8PIb)
   c. Students know how to solve problems involving distance, time, and average speed. (8PIc)
   d. Students know the velocity of an object must be described by specifying both the direction and the speed of the object. (8PId)
   e. Students know changes in velocity may be due to changes in speed, direction, or both. (8PIe)
   f. Students know how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction. (8PIf)

Physical Science: Forces
Unbalanced forces cause changes in velocity. As a basis for understanding this concept: (8P2)
   a. Students know a force has both direction and magnitude. (8P2a)
   b. Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces. (8P2b)
   c. Students know when the forces on an object are balanced, the motion of the object does not change. (8P2c)
   d. Students know how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction. (8P2d)
   e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction). (8P2e)
   f. Students know the greater the mass of an object, the more force is needed to achieve the same rate of change in motion. (8P2f)
   g. Students know the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system. (8P2g)

Physical Science: Structure of Matter
Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept: (8P3)
   a. Students know the structure of the atom and know it is composed of protons, neutrons, and electrons. (8P3a)
   b. Students know that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements. (8P3b)
   c. Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of $NaCl$ or long-chain polymers. (8P3c)
   d. Students know the states of matter (solid, liquid, gas) depend on molecular motion. (8P3d)
   e. Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently. (8P3e)

Earth Science
The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept: (8E4.)
   a. Students know galaxies are clusters of billions of stars and may have different shapes. (8E4a)
   b. Students know that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color. (8E4b)

    c. Students know that stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light. (8E4d)

    d. Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids. (8E4e)

Chemistry

Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept: (8P5)

    a. Students know reactant atoms and molecules interact to form products with different chemical properties. (8P5a)

    b. Students know the idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total mass stays the same. (8P5b)

    c. Students know chemical reactions usually liberate heat or absorb heat. (8P5c)

    d. Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction. (8P5d)

Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept: (8L6)

    a. Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms. (8L6a)

    b. Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur. (8L6b)

    c. Students know that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA. (8L6c)

The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept: (8P7)

    a. Students know each element has a specific number of protons in the nucleus (the atomic number) and each isotope of the element has a different but specific number of neutrons in the nucleus. (8P7b)

    b. Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity. (8P7c)

All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept: (8P8)

    a. Students know density is mass per unit volume. (8P8a)

    b. Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume. (8P8b)

    c. Students know the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced. (8P8c)

    d. Students know how to predict whether an object will float or sink. (8P8d)

Investigation and Experimentation

Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. (8I9)

    a. Students plan and conduct a scientific investigation to test a hypothesis. (8I9a)

    b. Students evaluate the accuracy and reproducibility of data. (8I9b)

    c. Students distinguish between variable and controlled parameters in a test. (8I9c)

    d. Students recognize the slope of the linear graph as the constant in the relationship $y = kx$ and apply this principle in interpreting graphs constructed from data. (8I9d)

    e. Students construct appropriate graphs from data and develop quantitative statements about the relationships between variables. (8I9e)

f. Students apply simple mathematical relationships to determine a missing quantity in a mathematical expression, given the two remaining terms (including speed = distance/ time, density = mass/volume, force = pressure x area, volume = area x height). (8I9f)
g. Students distinguish between linear and nonlinear relationships on a graph of data. (8I9g)