## Semester 1 of 2

| Unit Number: Title and Duration | Purpose | Priority Grade-Level Standards | Content Goals | Learner Outcomes | Resources and Materials |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Unit 1: Expressions and Equations 18 days | Understanding how to write/solve equations can be useful in both Adv Math (Business) Science and CTE programs. | 8.AEE.C Analyze and solve linear equations and pairs of simultaneous linear equations | Students will know: <br> - Vocabulary related to algebraic expressions and equations. <br> - The process by which to solve one step, two step, and multi-step equations. <br> - Identify an equation as having one solution, no solution or infinite solution. | Students will be able to: <br> - Solve linear equations with the correct property using a clear path including rational number coefficients, distributive property, combining like terms, and having variables on both sides. <br> - Examine a given linear equation in one variable, and determine if it has one solution, no solution, or infinite solution. | SMc Curriculum: Core Focus on Mathematics: Linear Equations (Block 1 1.1-1.7) |


| Unit 2: Sequence and Slope <br> 18 days | Understanding the relationship between unit rate and slope in graphs and contextual settings will allow students to write linear equations to make predictions in both math (business) and science. | 8.AEE.B Understand the connections between proportional relationships, lines, and linear equations. <br> 8.AFN.A Define, evaluate, and compare functions. <br> 8.AFN.B Use functions to model relationships between quantities. | Students will know: <br> - Unit, rate, and slope of line on a graph are the same. <br> - A function has one output for every input. <br> - A linear relationship can be shown in $\mathrm{y}=$ $\mathrm{mx}+\mathrm{b}$ format. | Students will be able to: <br> - Write an equation for the line in slope-intercept form $\mathrm{y}=\mathrm{mx}+\mathrm{b}$, understanding the slope of the line is the same between any two points. <br> - Compare functions algebraically graphically, numerically in tables and verbally by description. <br> - Identify visually through a graph or by ordered pairs on whether it is a linear function or nonlinear. <br> - Write an equation in slope-intercept form identifying start value and rate of change. | SMc Curriculum: Core <br> Focus on <br> Mathematics: Linear <br> Equations (Block 2) |
| :---: | :---: | :---: | :---: | :---: | :---: |


| Unit 3: Using Linear Equations 18 days | Understanding how to graph linear equations and write linear equations from a graph is helpful to make predictions in both math (business) and science. | 8.AFN.A Define, evaluate, and compare functions. <br> 8.AFN.B Use functions to model relationships between quantities. | Students will know: <br> - Functions can be represented in different ways (algebraically, graphically, numerically, and contextually. <br> - A linear relationship can be shown in $y=$ $\mathrm{mx}+\mathrm{b}$ format. | Students will be able to: <br> - Create a graph based on $y=m x+$ b and interpret slope and start value (initial value) in authentic context. <br> - Write a linear equation from a graph using start value and finding slope by using slope triangle, formula, or table. <br> - Convert pointslope form and standard form to slope intercept form. <br> - Solve story problems with the use of $y=m x+b$ in authentic context. | SMc Curriculum: Core Focus on Mathematics: Linear Equations (Block 3 3.1-3.5; 3.7) |
| :---: | :---: | :---: | :---: | :---: | :---: |


| Unit 4: Systems of Equations <br> 24 days | Understanding how to write and solve systems of linear equations can be used in real life settings to comparison shop, business opportunities, and measurement costs. | 8.AEE.C Analyze and solve linear equations and pairs of simultaneous linear equations. <br> 8.NS.A Know that there are numbers that are not rational, and approximate them by rational numbers. | Students will know: <br> - A system is a set of two or more linear equations that have common variables. <br> - A solution to a system of two linear equations corresponds to the points of intersection, because the points can satisfy both equations simultaneously. <br> - Real Numbers involve rational and irrational numbers and be able to identify examples of each. | Students will be able to: <br> - Examine a system of linear equations, without solving, and determine the types of solution (one, none, infinite). <br> - Identify the solution to a system of linear equations as the point of intersection. <br> - Solve systems of linear equations algebraically and estimate solutions by graphing. <br> - Apply understanding of systems of linear equations to solve problems in context. <br> - Convert repeating decimals to fractions. | SMc Curriculum: Core Focus on Mathematics: Linear Equations (Block 44.14.7; 4.9) |
| :---: | :---: | :---: | :---: | :---: | :---: |


| Semester 2 of 2 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Unit Number: Title and Duration | Purpose | Priority Grade-Level Standards | Content Goals | Learner Outcomes | Resources and Materials |
| Unit 1: Pythagorean Theorem 18 days | Understanding of real number systems (irrational vs rational numbers)in application of Pythagorean theorem can be used in CTE careers such as construction, engineering and architecture. | 8.AEE.A Expressions and Equations Work with radicals and integer exponents <br> 8.NS.A Know that there are numbers that are not rational, and approximate them by rational numbers <br> 8.GM.B Understand and apply the Pythagorean Theorem. | Students will know: <br> - Perfect Squares and cube roots exist and are able to find the value of each by itself or represented in an expression. <br> - The square root of a perfect square is a rational number that can be used a point of reference on a number line to estimate a number not a perfect square (irrational numbers). <br> - The Pythagorean theorem and the converse of the Pythagorean theorem can be used to find unknown lengths | Students will be able to: <br> - Estimate, compare and order irrational numbers on a number line and justify the reasonableness of the approximation. <br> - Evaluate expressions involving perfect squares and cube roots. <br> - Explain a model of the Pythagorean Theorem and its converse. <br> - Apply the Pythagorean Theorem to find unknown lengths of two- and threedimensional figures in real world and | SMc Curriculum: Core <br> Focus on <br> Mathematics: <br> Geometry (Block 2 <br> 2.1-2.7) |

$\left.\begin{array}{|l|l|l|l|l|l|}\hline & & & \begin{array}{l}\text { and prove/disprove } \\ \text { right triangles. }\end{array} & \begin{array}{l}\text { mathematical } \\ \text { problems. } \\ \text { Apply the } \\ \text { Pythagorean } \\ \text { theorem to find }\end{array} \\ \text { the distance } \\ \text { between two } \\ \text { points. }\end{array}\right]$

|  |  |  | - Angle sum of triangles can be used to find missing measurements. | - Determine similarity or congruence between triangles and find missing measures of angles and sides. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Unit 3: <br> Transformations 16 days | Understanding of transformational geometry applicable to CTE careers. | 8.GM.A Understand congruence and similarity using physical models, transparencies, or geometry software. | Students will know: <br> - Properties of transformations (translation, rotation, reflection and dilation). | Students will be able to: <br> - Describe the sequence of translations, rotations, and/or reflections between two congruent figures. <br> - Describe the effect of dilations, translations, rotations, and reflections on twodimensional figures using coordinates. <br> - Use rules to describe the sequence of dilations, translations, | SMc Curriculum: Core Focus on Mathematics: Geometry (Block 3 3.1-3.6) |


|  |  |  |  | rotations, and/or <br> reflections <br> between two <br> similar figures. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Unit 4: Exponents and Volume 16 days | Understanding integer exponents with the powers of 10 will be useful in science when learning about small and large sizes (Cells vs. Planet size) <br> Understanding of formulas in authentic contexts useful in science, CTE programs, and anywhere that formulas might be used. | 8.AEE.A Expressions and Equations Work with radicals and integer exponents <br> 8.GM.C Solve mathematical problems in authentic contexts involving volume of cylinders, cones, and spheres. | Students will know: <br> - Properties of integer exponents (multiplication and division). <br> - The difference between scientific notation and standard notation. <br> - The formulas for finding volume of sphere, cone, and cylinder. | Students will be able to: <br> - Apply properties of integer exponents and generate equivalent numerical expressions. <br> - Use and perform operations with scientific notation in both standard and scientific notation form. <br> - Compute with numbers in scientific notation. <br> - Find the volume of cylinders, spheres, cones, and solve real world problems related to them. | SMc Curriculum: Core Focus on Mathematics: Geometry (Block 4 4.1-4.8) |

End of Semester 2

