

## UNIT OF STUDY

<b>Title:</b> Systems of equations		<b>Subject/Course:</b> Algebraic Connections	<b>Length:</b> 10 days
<b>Topic:</b> CS3 unit 8		<b>Grade:</b> 12th	<b>Designer:</b> Prado
<b>UNIT GOALS AND EXPECTATIONS</b>			
<b>IMPORTANT CONCEPTS/UNDERSTANDINGS:</b> <ul style="list-style-type: none"><li>◆ Systems of equations can be used to solve two or more equations with two unknowns.</li><li>◆ Linear systems can be solved by graphing</li><li>◆ Linear systems can be solved by addition of equations; i.e. elimination of a variable</li><li>◆ Solutions for linear systems can be found using matrices</li><li>◆ Substitution can be used to solve linear equations</li><li>◆ Graphing a linear inequality can help find all possible solutions.</li></ul>		<b>ESSENTIAL QUESTIONS:</b> <ul style="list-style-type: none"><li>◆ What does a system of equations look like?</li><li>◆ How do I determine which side of the line to shade? (test points on either side of the line)</li><li>◆ How do I solve equations for a given variable?</li><li>◆ What is a matrix?</li><li>◆ What does reduced row echelon mean?</li><li>◆ How can a linear equation be converted into an augmented matrix?</li><li>◆ What is the order of operations in an algebraic equation?</li><li>◆ How do I use the order of operations to solve an equation?</li></ul>	
<b>STUDENT LEARNING EXPECTATIONS:</b> SEI.3.AC.2 SLE.2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically, and graphically. SEI.3.AC.3 SLE 3. Solve linear formulas and literal equations for a specified variable			
<b>SPECIFIC DECLARATIVE KNOWLEDGE – What I know</b> <ul style="list-style-type: none"><li>◆ Explain vocabulary words: variable, substitution, linear equation, standard form matrix, augmented matrix, linear inequality</li><li>◆ Identify a system of equations and inequalities</li><li>◆ Apply graphing to solve a system of equations and inequalities</li><li>◆ Apply rules of substitution to solve a system of linear equations</li><li>◆ Identify an equation in standard form</li><li>◆ Identify an echelon matrix</li><li>◆ Identify an augmented matrix</li><li>◆ Identify a reduced row echelon matrix</li></ul>		<b>SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do</b> <ul style="list-style-type: none"><li>◆ Determine if a point is the solution to a system of equations</li><li>◆ Solve a system by graphing</li><li>◆ Be able to use substitution and combinations to solve a system of linear equations</li><li>◆ Interpret an echelon matrix to determine types of solutions</li><li>◆ Convert linear equations into an augmented matrix form</li><li>◆ Convert linear equations using reduced row echelon</li><li>◆ Graph a system of linear inequalities</li><li>◆ Determine the solution of inequalities by testing points given the graph of a linear system of equations.</li></ul>	
<b>UNIT ASSESSMENTS</b>			

**(Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)**

<b>Traditional Assessments:</b> Unit 8 exam Vocabulary quiz Quizzes	<b>Other Evidence of Learning:</b> Homework Class work Getting started exercises
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ACTIVITIES AND LEARNING EXPERIENCES	Resources
<b>Determine if a point is the solution to a system of equations and solve a system by graphing</b> <ul style="list-style-type: none"> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to determine if the given point is a solution to the system of equations</li> <li>◆ S will do in-class worksheet on determining if given point is a solution to the system of equations</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to solve a system of equations by graphing (with and without calculator)</li> <li>◆ S will do in-class worksheet on solving a system of equations by graphing (with and without calculator)</li> <li>◆ T will go over worksheet and assign homework</li> </ul>	<ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on determining if given point is a solution to the system of equations and solving a system of equations by graphing</li> <li>◆ Smart board</li> <li>◆ Calculator</li> </ul>
<b>Solving a special linear system and a linear system not set to <math>y=</math> by graphing</b> <ul style="list-style-type: none"> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to solve a special linear system by graphing (without calculators only)</li> <li>◆ S will do in-class worksheet on solving a special linear system by graphing (without calculators only)</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to solve a linear system by graphing that is not set to <math>y=</math> (after solving for <math>y</math> then with and without calculator)</li> <li>◆ S will do in-class worksheet on solving linear systems by graphing that are not set to <math>y=</math> (with and without calculator)</li> <li>◆ T will go over worksheet and assign homework</li> </ul>	<ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on solving a special linear system by graphing and solving a linear system by graphing that is not set to <math>y=</math></li> <li>◆ Smart board</li> <li>◆ Calculators</li> </ul>
<b>Solve for the indicated variable and using substitution to solve the system of linear equations</b> <ul style="list-style-type: none"> <li>◆ S will learn vocabulary using the 4-step process: variable, substitution, and linear equation</li> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to solve an equation for a given variable</li> <li>◆ S will do in-class worksheet on solving an equation for a given variable</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to use substitution to solve the system of linear equations</li> <li>◆ S will do in-class worksheet on using substitution to solve the system of linear equations</li> <li>◆ T will go over worksheet and assign homework</li> </ul>	<ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on how to solve an equation for a given variable and how to use substitution to solve the system of linear equations</li> <li>◆ Smart board</li> <li>◆ Calculators</li> </ul>

<p><b>Solve equations for the given variable (in the indicated equation) and solve a linear system by substitution (after solving for the given variable)</b></p> <ul style="list-style-type: none"> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to solve the given equation for the given variable</li> <li>◆ S will do in-class worksheet on solving the given equation for the given variable</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to use what the students found on the first worksheet to solve the second worksheet by using substitution of the given variable</li> <li>◆ S will do in-class worksheet using the solutions on the first worksheet to solve the second worksheet by using substitution of the given variable</li> <li>◆ T will go over worksheet and assign homework</li> </ul> <p><b>Solve a linear system by combinations and solve a linear system by combinations in standard form</b></p> <ul style="list-style-type: none"> <li>◆ S will learn vocabulary word: standard form</li> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to solve a linear system by combinations</li> <li>◆ S will do in-class worksheet on solving linear systems by combinations</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to solve a linear system by combinations in standard form</li> <li>◆ S will do in-class worksheet on solving linear systems by combinations in standard form</li> <li>◆ T will go over worksheet and assign homework</li> </ul> <p><b>Determine type of solutions from an echelon matrix and converting linear equations into <math>Ax+By=C</math> form</b></p> <ul style="list-style-type: none"> <li>◆ S will learn vocabulary word: matrix</li> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to determine type of solutions from an echelon matrix (no solutions, infinite solutions, or one solution)</li> <li>◆ S will do in-class worksheet on determining type of solutions from an echelon matrix</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to convert linear equations into <math>Ax+By=C</math> form</li> <li>◆ S will do in-class worksheet on converting linear equations into <math>Ax+By=C</math> form</li> <li>◆ T will go over worksheet and assign homework</li> </ul> <p><b>Converting linear equations into an augmented matrix form and converting linear equations using reduced row echelon</b></p> <ul style="list-style-type: none"> <li>◆ S will learn vocabulary word: augmented matrix</li> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to convert linear equations into an augmented matrix form</li> <li>◆ S will do in-class worksheet on how to convert linear equations into an augmented matrix form</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to convert linear equations using reduced row echelon (discussing consistent and inconsistent systems)</li> <li>◆ S will do in-class worksheet on how to convert linear equations using reduced row echelon</li> <li>◆ T will go over worksheet and assign homework</li> </ul>	<ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on solving the given equation for the given variable and how to use the results to solve by using substitution</li> <li>◆ Smart board</li> </ul> <ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on how to solve a linear system by combinations and how to solve a linear system by combinations in standard form</li> <li>◆ Smart board</li> </ul> <ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on how to determine type of solutions from an echelon matrix and how to convert linear equations into <math>Ax+By=C</math> form</li> <li>◆ Smart board</li> </ul> <ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on converting linear equations into an augmented matrix form and how to convert linear equations using reduced row echelon</li> <li>◆ Smart board</li> </ul>
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<p><b>Graphing a linear inequality and determining if a point is the solution to a system of inequalities</b></p> <ul style="list-style-type: none"> <li>◆ S will learn vocabulary word: linear inequality</li> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to graph a linear inequality (with and without calculator)</li> <li>◆ S will do in-class worksheet on graphing linear inequalities (with and without calculator)</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to determine if a point is the solution to a system of inequalities</li> <li>◆ S will do in-class worksheet on determining if a point is the solution to a system of inequalities</li> <li>◆ T will go over worksheet and assign homework</li> </ul> <p><b>Graph a system of linear inequalities and graphing special linear inequalities</b></p> <ul style="list-style-type: none"> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to graph a system of linear inequalities (with and without calculator)</li> <li>◆ S will do in-class worksheet on graphing a system of linear inequalities (with and without calculator)</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to graph special linear inequalities (with and without calculator)</li> <li>◆ S will do in-class worksheet on how to graph a special linear inequality (with and without calculator)</li> <li>◆ T will go over worksheet and assign homework</li> </ul> <p><b>Graph special system of linear inequalities and solving linear formula for specified values</b></p> <ul style="list-style-type: none"> <li>◆ S will do Getting Started activity sheet</li> <li>◆ T will model how to graph special systems of linear inequalities</li> <li>◆ S will do in-class worksheet on how to graph special systems of linear inequalities (with and without calculators)</li> <li>◆ T will go over worksheet</li> <li>◆ T will model how to solve linear formulas for specified values</li> <li>◆ S will do in-class worksheet on solving linear formulas for specified values</li> <li>◆ T will go over worksheet and assign homework</li> </ul>	<ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on graphing a linear inequality and how to determine if a point is the solution to a system of inequalities</li> <li>◆ Smart board</li> <li>◆ Calculator</li> </ul> <ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on how to graph a system of linear inequalities and how to graph special linear inequalities</li> <li>◆ Smart board</li> <li>◆ Calculators</li> </ul> <ul style="list-style-type: none"> <li>◆ Getting Started problems</li> <li>◆ Worksheets on how to graph special systems of linear inequalities and how to solve linear formulas for specified values</li> <li>◆ Smart board</li> <li>◆ Calculators</li> </ul>
<b>Career Connections</b>	
<b>Advertising agent, newspaper editor, and football coach</b>	