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| **Title:** | Unit 1 - Linear Review and Systems of Equations |
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| **Grade Level:** | Algebra II - Daily; 10 - 12 graders |
| **Unit Overview:** | In this unit we will briefly review the Algebra 1 skills of solving equations and graphing lines. We will also review the graphical and algebraic methods of solving 2x2 systems of linear equations. We will expand the algebraic method to solve systems of 3x3 linear equations. We will also look at applications of systems in the real world and introduce how to use technology to help solve systems. The application problems will all be themed for this unit, transistors, chips, technology. |
| **Unit Calendar** | 9 days of review, 14 days for Systems of Equations; 1 test |
| **Content Standards and Objectives:** | AII.SE.2: Solve systems of two or three linear equations in two or three variables algebraically and using technology.  AII.SE.3: Represent real-world problems using a system of linear equations in three variables and solve such problems with and without technology. Interpret the solution and determine whether it is reasonable. |
| **Essential Question:** | Explain the processes of solving a system of linear equations.  What are the pros and cons of each method?  What are the possible solutions to a system of equations and why are they limited to those solutions?  What are the classifications of a system of linear equations and how are the connected to the solutions of a system of equations?  How can a calculator help us in solving a system of equations? |
| **Student will Know:** | The process of isolating a variable  How many solutions are possible for a system of equations  How to use the three methods to solve a system  The names of the classifications of a system  How to interpret a word problem |
| **Student will Do:** | Solve a system of equations with each of the methods  Determine when a system does not have a unique solution  Classify a system based upon the solution that is found  Create a system of equations from a story problem  Analyze their solution to determine if it is reasonable  Use technology to help with the solving of a system of equations |
| **Unit Plan Outline:** | ***Lesson 1 (1 day): Introduction***  Vocabulary: transistor, central processing unit (cpu),  Synopsis: On the first class meeting we will first do introductions and go over the syllabus. We will then go through a power point with activities to introduce myself, what I did the summer, the concept of a transistor which will be the theme for all application problems in the unit.  In class Assignment: Reading and summary of article\*  Homework: Signed Syllabus  ***Lesson 2 (1 day): Evaluate and Simplify Algebraic Expressions***  Synopsis: In this lesson we will work through the hand out “Get Your Technology Out of My Math!”. This activity is a way to review essential algebraic skills (factors, substitution, order of operations, unit conversion, simplifying formulas and expressions, evaluating, distributive property) while trying to teach students about size of transistors and the amount of energy they use. This is a replacement for the boring standard review lesson of all of these skills.  In class Assignment: Get Your Technology Out of My Math!\*  ***Lesson 3 (2 days): Solve Linear Equations***  Vocabulary:  Synopsis: This lesson will be a 2 day review of solving equations. On the first day we will look at solving equations that are one step, two step, and variables on both sides of. The second day we will look at more complex equations with variables on both sides as well equations that do not have a unique solution. We will also look at equations that have non-integer coefficients.  In class Assignment: (day 1) pg. 30; 14 - 25, application worksheet\*; (day 2) pg. 30; 29-32, 41-44, application worksheet\*  ***Lesson 4 (3 days): Graphing Lines in the Coordinate Plane***  Vocabulary: coordinate plane, slope, intercepts, Standard Form, Slope-Intercept Form, ordered pair  Synopsis: In this 3 day lesson we will review how to graph linear equations. On the first day we will review the coordinate plane. We will look at how the coordinate plane is created and how we plot a point on the plane. We will also discuss how slope is the movement between two points. On the second day we will discuss graphing lines in slope-intercept form by using the intercept as a starting point and the slope as a movement through the plane. The last day we will review how to graph lines when they are in standard form by using intercepts as well as using the values of A, B, and C to find the slope and y-intercept. Application problems will occur on days 2 and 3 of the lesson.  In class Assignment: (day 1) worksheet/(day 2) worksheet\*/(day 3) worksheet\*  ***Lesson 5 (1 day):  Solving Systems by Graphing***  Vocabulary: consistent, inconsistent, dependent, independent  Synopsis: In this lesson we will using graphing to solve systems of linear equations. We will graph each line and then determine the solution. We will also classify each system by the number of solutions they have.  In class Assignment: worksheet  ***Lesson 6 (1 day): Review and Quiz***  Synopsis: On this day we will take our weekly Friday Quiz  Summative Assessment: Unit 1 - Friday Quiz 2\*  ***Lesson 7 (4 days): Solving Systems Algebraically***  Vocabulary: substitution, elimination, linear combination  Synopsis: In this lesson we will review the skills of solving systems of equations. We will spend 1 day solving systems with the substitution method. We will then spend 1 day solving systems with the elimination (linear combination) method. We will then spend 2 days work in on both methods as well as when is it best to use each of the methods.  In class Assignment: (day 1) pg. 146; 10 - 15, 31, 34/(day 2) pg. 146; 22 - 30, 32, 36/ (day 3) worksheet of application problems\*/ (day 4) worksheet of application problems\*  ***Lesson 8 (1 day): Review and Quiz***  Synopsis: On this day we will take our weekly Friday Quiz after we review together.  Summative Assessment: Unit 1 - Friday Quiz 3\*  ***Lesson 9 (3 days): Solving 3x3 Systems***  Vocabulary: ordered triple  Synopsis: We will spend three days working on solving systems of 3x3 equations. This can be very complicated and is a lot of work for students to master. We will use the elimination method since it tends to be the easiest process to use. The homework of these lessons will depend greatly on how far we get with notes and the classes understanding each day. On the third day we will apply real world problems to systems that are 3x3.  In class Assignment: (day 1) pg. 171; 9 - 11/ (day 2) pg. 171; 12 - 14/ (day 3) worksheet  ***Lesson 10 (1 day): Review and Quiz***  Synopsis: On this day we will take our weekly Friday Quiz  Summative Assessment: Unit 1 - Friday Quiz 4  ***Lesson 11 (3 days): Review and Test***  Synopsis: We will spend two days reviewing for the first test. Then students will take Unit 1 - Test  In class Assignment: Unit 1 Test Review  Summative Assessment: Unit 1 Test |
| **Mathematical Practices:** | |  |  | | --- | --- | | **Mathematical Practices** | **Evidence of Student Engagement in Mathematical Practices** | | 1.  Make sense of problems and persevere in solving them. | On Systems of 3 equations and 3 unknowns | | 2.  Reason abstractly and quantitatively. | On the application problems throughout the unit | | 3.  Construct viable arguments and critique the reasoning of others. |  | | 4.  Model with mathematics. | On Application Problem days | | 5.  Use appropriate tools strategically. |  | | 6.  Attend to precision. | On Solving Systems with Graphing | | 7.  Look for and make use of structure. | On the application problems throughout the unit | | 8.  Look for and express regularity in repeated reasoning. |  | |