Mathematics Pacing Guide

Algebra 2

2017-18

Topic 2: Linear Systems (Chapter 3)

Transfer Goals
1) Demonstrate perseverance by making sense of a never-before-seen problem, developing a plan, and evaluating a strategy and solution. 2) Effectively communicate orally, in writing, and using models (e.g., concrete, representational, abstract) for a given purpose and audience. 3) Construct viable arguments and critique the reasoning of others using precise mathematical language.

Essential Questions:

- What condition(s) indicate(s) an independent system? A dependent system? A consistent system?
- What do you look for to determine whether to use elimination or substitution to solve a linear system?
- How does graphing a system of inequalities on the same coordinate plane help you see which points satisfy both inequalities?
- Ina linear programming problem, what determines the feasible region?
- Why might you use different methods for solving systems of equations with three variables?
- What do the matrix row operations have in common with elimination?

Standards: A-CED 2, A-REI 6, A-REI 12, A-CED 3, A-REI 8

Suggested Timeframe: 2.5 weeks/13 days
Start Date: Sept. 5, 2017
Assessment Dates: Sept. 21, 2017

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Resources
1 day	**Topic 2 Opening Activity** (p. 133 Common Core Performance Task)					
1 Day	**Lesson 3-1: Solving Systems Using Tables and Graphs** SMP: 1,2,3,4,5 (pp. 134-141) **A-CED 2**	• What condition(s) indicate(s) an independent system? A dependent system? A consistent system? An inconsistent system? **Inquiry Question Options:** p. 134 "Solve It"	• A system of equations is solved by finding a set of values that replace the variables in the equations and make each equation true. • A point of intersection (x, y) of the graphs of the function f and g is a solution of the system $y = f(x)$, $y = g(x)$.	**Vocabulary:** system of equations, linear system, solution of a system, inconsistent system, consistent system, independent system, dependent system **Concepts:** • **Graphical Solutions of Linear Systems:** intersecting lines, coinciding lines, parallel lines	• Solve a linear system using a graph or a table. • Identify whether a linear system is inconsistent, consistent, dependent, or independent.	**Common Core Problems:** 4,5,6, 13,14, 38, 39, 40,41, 42, 43, 44-47, 48, 49, 50, 51,52 **Thinking Maps:** Tree Map for Graphical Solutions of Linear Systems.

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
- ☐ Use of Talk Moves
- ☐ Note-taking
- ☐ Use of Manipulatives
- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Additional Resources
1 Day	**Lesson 3-2: Solving Systems Algebraically** SMP: 1,2,3 (pp. 142-148) **A-REI 6**	• What do you look for to determine whether to use elimination or substitution to solve a linear system? **Inquiry Question Options:** p. 142 "Solve It"	• A system of equations can be solved by writing equivalent systems until the value of one variable is clear, then substituting to find the value(s) of the other variable. • If the equations of two systems are equivalent, then a solution of the system that is easier to solve is also a solution of the more difficult system.	**Vocabulary:** equivalent systems • **Procedures for**: solving systems by substitution and by elimination	• Solve linear equations algebraically using substitution or elimination.	**Common Core Problems:** 7, 8, 9, 19, 20, 21, 43, 53, 54, 55, 56, 57, 62, 63 **Thinking Maps:** Flow Maps to show processes for solving by substitution and elimination.
1 Day	**Lesson 3-3: Systems of Inequalities** SMP: 1,2,3,4,7 (pp. 149-155) **A-REI 12**	• How does graphing a system of inequalities on the same coordinate plane help you see which points satisfy both inequalities? **Inquiry Question Options:** p. 149 "Solve It"	• A system of inequalities can be solved in more than one way. Graphing is usually the most appropriate method to solve a system of inequalities. • The solution is the set of all points that are solutions of each inequality in the system.	**Vocabulary:** systems of inequalities, absolute value system • **Procedures for**: solving systems of inequalities by using a table and by graphing.	• Solve systems of linear inequalities.	**Common Core Problems:** 5, 6, 7, 31, 32, 33, 34, 35, 55, 56, 57, 58 **Thinking Maps:** Flow Maps to show processes for solving inequalities by using a table and by graphing.
2 Days	**Lesson 3-4: Linear Programming** SMP: 1,3,4 (pp. 157-162) **A-CED 3**	• Ina linear programming problem, what determines the feasible region? **Inquiry Question Options:** p. 157 "Solve It"	• Some real-world problems involve multiple linear relationships. Linear programming accounts for all of these linear relationships and gives the solution to the problem. • The feasible region contains all the points that satisfy all the constraints.	**Vocabulary:** constraint, linear programming, feasible region, objective function **Concepts:** • Vertex Principle of Linear Programming	• Solve problems using linear programming. • Graph the constraints of a system, name all the vertices, and find the values of x and y that maximize or minimize the objective function.	**Common Core Problems:** 7, 8, 9, 13, 14, 15, 16, 23, 24
2 Days	**Lesson 3-5: Systems With Three Variables** SMP: 1,3 (pp. 166-173) **A-REI 6**	• Why might you use different methods for solving systems of equations with three variables? **Inquiry Question Options:** p. 166 "Solve It"	• Systems of three equations in three variables can be solved using some of the same algebraic methods used to solve systems of two equations in two variables. • If the equations of two systems are equivalent, then a solution of the system that is easier to solve is also a solution of the more difficult system.	**Vocabulary:** (no new vocabulary for this lesson)	• Solve systems in three variables using elimination. • Solve systems in three variables using substitution.	**Common Core Problems:** 5,6,7, 30, 31, 32, 42, 43, 44, 45 **Thinking Maps:** Double-bubble Map to compare solving equations with two variables and three variables.

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Additional Resources
1 Day	**Lesson 3-6: Solving Systems Using Matrices** SMP: 1,2,3,5 (pp. 174-181) **A-REI 8**	• What do the matrix row operations have in common with elimination? **Inquiry Question Options:** p. 174 "Solve It"	• Matrices can be used to represent and solve a system of equations without writing the variables. • The matrix row operations of adding rows and multiplying by a constant are equivalent to the addition and multiplication properties of equality.	**Vocabulary:** matrix, matrix element, row operation • **Row Operations**	• Represent a system of linear equations with a matrix. • Solve a system of linear equations using matrices.	**Common Core Problems:** 6, 7, 30, 31, 38, 40, 41 **Thinking Maps:** Double-bubble Map to compare matrix row operations with elimination.
1 Day	**Topic 2 Performance Task** (p. 182 Completing the Performance Task & On Your Own)					
2 Days	**Review Topic 2 Concepts & Skills** Use Textbook Resources and/or Teacher Created Items					
1 Day	**Topic 2 Assessment** (Created and provided by PUSD)					

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
- ☐ Use of Talk Moves
- ☐ Note-taking
- ☐ Use of Manipulatives
- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

This page is blank.