**Algebra 3-4**

**Unit 3: Linear Systems**

**Conceptual Lens:**

Designer(s): OPS Secondary Math Department Grade Level: Algebra 3-4, 2013

Linear Systems

Chapter Overview

Chapter 3 expands on students’ understandings and skills related to functions, equations, and graphs. In this chapter, students will develop the answers to the Essential Questions posed on the following page and the skills bulleted next to them.

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| **Unit 3 : Linear Systems** | | |
| **Essential Questions** | **Standard** | **Objectives**  **F=Factual C=Conceptual D=Debatable** |
| 3.1 How does representing functions graphically help you solve a system of equations? | MA 12.3.3 | * Students will solve a system of linear equations by graphing the equations to find the point(s) of intersection. (C) |
| * 1. How does writing equivalent equations help you solve a system of equations ? | MA 12.3.3 | * Students will use substitution and elimination methods to write equivalent equations until they get an equation with only one variable. (C) |
| * 1. How are the properties of equality used in the matrix solution of a system of equations? | MA 12.3.3 | * Students will use the Addition Property of Equality to add rows of matrices and the Multiplication Property of Equality to multiply rows by a constant. (C) * Students will use row operations to get reduced row echelon form, which gives the solution. (C) |

**Learning Goal: Linear Systems**

**Critical Content and Skills:**

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| *Knowledge Statements*  Students will know…   1. **Vocabulary**: dependent systems, equivalent systems, independent system, linear system, matrix, matrix element, row operation, and system of equations. | *Key Skill Statements*  Students will know how to…   1. Solve systems using the graphing method. 2. Solve systems using both the substitution and elimination methods. 3. Solve systems of inequalities. 4. Solve problems using linear programming. 5. Solve systems with three variables. 6. Solve systems using matrices. 7. Apply knowledge of all methods to solve application problems. |

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| **Algebra 3-4**  **Linear Systems** | | | |
| **Advanced**  **Score 4.0** | In addition to the Proficient (3.0) performance, makes ***indepth*** inferences and extended applications of what was learned, including connections to other experiences. | | * Solving systems of 3 equations. * Solving systems using matrices. |
|  | **Proficient +**  **Score 3.5** | In addition to the complex ideas and processes (Proficient 3.0) performance, ***partial success*** at in-depth inferences and extended applications of what was learned, including connections to other experiences. | |
| **Proficient**  **Score 3.0** | ***No major*** errors or omissions regarding any of the information and simple (Basic, 2.0) or complex processes (Proficient, 3.0) that was explicitly taught. | | * Solving systems of linear inequalities. * Solving problems involving linear programming. * Solving systems using matrices. * Solving systems of 3 equations. |
|  | **Basic +**  **Score 2.5** | ***No major*** errors or omissions regarding any of the information and/or simpler details and processes (Basic, 2.0) and ***partial*** knowledge of the more complex ideas and processes (Proficient, 3.0) | |
| **Basic**  **Score 2.0** | ***No major*** errors or omissions regarding the simpler details and processes (Basic, 2.0), but ***major*** errors or omissions regarding the more complex ideas and processes (Proficient, 3.0). | | * Solving systems algebraically. * Solving systems using tables and graphs. * Representing systems with matrices. |
| **Below Basic**  **Score 1.0** | A ***partial*** understanding of ***some*** of the simpler details and processes (Basic, 2.0), but ***major*** errors or omissions regarding the more complex ideas and processes. | | |
| **Failing**  **Score 0** | ***No*** evidence or ***insufficient*** evidence of student learning. | | |

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| **Learning Experiences** | **Text Pages/Resources** |
| **Vocabulary**   * Word wall * Foldable – See Glencoe @2010 Foldables by Dinah Zike for more information * Matching the word to the definition, graph, or example * Anticipation guide (pre and post) |  |
| * **Lessons Resources at the end of each section.** * **Online resources at pearsonsuccessnet.com** | Pearson Algebra 2: 3.1-3.6 |
| **General:**  **Test-Taking Strategy**  Be sure to check the reasonableness of your answer. If students are asked for the balance of a bank account where you were dealing with amounts in the hundreds, it is not reasonable to give an answer in the millions. To make sure the answer to a problem is reasonable, you can estimate before you calculate. If the answer is close to your estimate, your answer is probably correct. |  |

**Teacher Notes/Additional Resources**

**General Algebra & Math sites:**

* AlgebraLAB: Making Math & Science Connections [www.algebralab.org](http://www.algebralab.org)
* Classzone from Holt McDougall’s free site includes really cool animations. You and your students will simply need to figure out which chapter in their book relates to what we’re studying. <http://www.classzone.com/cz/books/algebra_1_2011_na/book_home.htm?state=NE>
* Kuta software <http://www.kutasoftware.com> Excellent free worksheets (with answers) <http://www.kutasoftware.com/free.html>
* NCTM’s Figure This! Web site has several challenge problems that are designed for families to do together. <http://figurethis.org/download.htm> These challenges (there are 80 of them!) could be used for daily warm-ups in class (several involve estimation), weekly Problem-of-the-Week, and even a challenge problem along with their homework, if relevant.
* Math is Fun! Includes an illustrated math dictionary and helpful tutorials for students. [www.mathisfun.com](http://www.mathisfun.com)
* Daily Math Review <http://www.aea11.k12.ia.us/E2T2/dmr.html>
* Great online timer: <http://www.online-stopwatch.com>
* Porta Portal’s consolidated resource list <http://guest.portaportal.com/mrburke>
* Algebra2Go <http://www.saddleback.edu/faculty/lperez/algebra2go/index.html>
* About.com Education site has great warm ups <http://712educators.about.com/cs/warmups/l/blwarmmath.htm>
* Southern Regional Education Boards Instructional Resources <http://www.evalutech.sreb.org/InstResources/index.asp>

**Books:**

* Various resources provided by publishers for the book selection process

**Videos:**

* BrainPop [www.brainpop.com](http://www.brainpop.com)
* Teacher Tube [www.teachertube.com](http://www.teachertube.com)