

## Unit 2: Systems of Linear Equations

### Algebra 1

15 Class Meetings

*Created July 2020, Revised May 2022*

#### Essential Questions

- How can you graph and solve a system of equations?
- How can systems of equations be used to represent and solve real-world situations?

#### Enduring Understandings with Unit Goals

**EU 1:** Systems of equations can be solved by graphing, substitution, or by eliminating a variable.

- Solve systems of equations by graphing, substitution, or by eliminating a variable.

**EU 2:** Systems of linear equations can be used to model and solve real-world problems.

- Model real-world problems using systems of linear equations.
- Solve real-world problems using systems of linear equations (by graphing, substitution, or by eliminating a variable).

#### Standards

##### Common Core State Standards:

- **HS.F.IF.C.7:** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- **H.SN.Q.A.2:** Define appropriate quantities for the purpose of descriptive modeling.
- **HS.A.CED.A.3:** Represent constraints by equations or inequalities, and by systems of equations, and interpret solutions as viable or nonviable options in a modeling context.
- **HS.A.REI.C.5:** Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
- **HS.A.REI.C.6:** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- **HS.A.REI.D.11:** Explain why the  $x$ -coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately.

## Unit 2: Systems of Linear Equations

### Algebra 1

15 Class Meetings

Created July 2020, Revised May 2022

#### ISAAC Vision of the Graduate Competencies

**Competency 1:** Write effectively for a variety of purposes.

**Competency 2:** Speak to diverse audiences in an accountable manner.

**Competency 3:** Develop the behaviors needed to interact and contribute with others on a team.

**Competency 4:** Analyze and solve problems independently and collaboratively.

**Competency 5:** Be responsible, creative, and empathetic members of the community.

#### Unit Content Overview

##### 1. Solving Systems by Graphing

- Solve a System of Equations by Graphing
- Solve a System of Equations with Infinitely Many Solutions or No Solution
- Solve a System of Equations on the Calculator

##### 2. Solving Systems Using Substitution

- Solve a System of Equations using Substitution
- Solve for a Variable and Using Substitution
- Solve a System with Infinitely Many Solutions or No Solutions

##### 3. Solving Systems Using Elimination

- Solve a System of Equations by adding equations
- Solve a System of Equations by Multiplying one or more equations

##### 4. Applications of Linear Systems

- Write a System of Equations given a scenario
- Choose a method for solving linear systems
- Solve a Real-World Problem represented by a linear system

##### Interdisciplinary Connection:

- Language Arts- Accountable Talk, Word Problems

## Unit 2: Systems of Linear Equations

### Algebra 1

15 Class Meetings

Created July 2020, Revised May 2022

#### Daily Learning Objectives with TWPS Activities

Students will be able to...

- Use the graphing calculator to graph linear functions. \*\*
  - *Do Now: Finding Values from a Linear Equation*
  - *Do Now: Exponents (revisited)*
- Graph a system of linear equations to determine the solution.
  - *Do Now: Eliminating a Fraction*
- Calculate the solution to a system of linear equations by using the substitution property.
  - *Do Now: Finding a Linear Equation from a Graph*
- Solve systems by adding or subtracting to eliminate a variable
  - *Do Now: Power Property (revisited)*
- Eliminate a variable by using the properties of equality and multiplication. \*\*
  - *Do Now: Finding the value of x*
  - *Do Now: Comparing Values in Scientific Notation*
- Choose and apply the best method for solving a system of linear equations
  - *Do Now: Determining Infinitely Many Solutions*
- Create a system of equations to represent a real-world problem and use it to solve the problem\*\*
  - *Do Now: Graphing Calculator Review*
  - *Do Now: Solving a Multi-Step Equation*

#### Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework

#### EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping

## Unit 2: Systems of Linear Equations

### Algebra 1

15 Class Meetings

Created July 2020, Revised May 2022

- Non-verbal Assessments

### Assessments

#### **FORMATIVE ASSESSMENTS:**

- Warm-ups (SBAC)
- Accountable Talk Discussions
- Daily Think-Write-Pair Share (TWPS)
- Daily Do Now
- Warm-ups (SBAC prep)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework

#### **SUMMATIVE ASSESSMENTS:**

- Quiz on EU 1
- FIAB – Proportional Relationships, Lines, and Linear
- Equations Performance Task – Picture This

### Assessments

### Unit Task

**Unit Task Name:** Picture This

**Description:** Students will use information learned during this unit about how systems of equations can be solved with graphing, substitution or by eliminating a variable (EU 1), and a real-life problem can be solved using systems of equations (EU 2). Students will be given a real-world scenario. They will write a system of equations to represent the scenario and solve their systems using all three methods that they

## Unit 2: Systems of Linear Equations

### Algebra 1

15 Class Meetings

*Created July 2020, Revised May 2022*

learned in this unit. Students will then have to write an explanation to justify their solution(s). They will write about whether or not their answers were the same when using each method and why they think that is.

**Evaluation:** Summative Assessment and Problem-Solving Rubric

### Unit Resources

- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Kahn Academy
- Match Fishtank
- Map.Mathshell.org
- Online resources