Unit 7: Systems of Equations and Inequalities

Content Area: **Mathematics**
Course(s): **Algebra 8**
Time Period: **February**
Length: **3 weeks**
Status: **Published**

Transfer

Big Idea: Systems of Equations & Inequalities

Enduring Understandings

Properties of numbers and equality can be used to transform an equation (or inequality) into equivalent, simpler equations (or inequalities) in order to find solutions

Useful information about equations and inequalities (including solutions) can be found by analyzing graphs

The numbers and types of solutions vary predictably, based on the type of equation

Many real-world mathematical problems can be represented algebraically. These representations can lead to algebraic solutions

Essential Questions

How do I decide the best method to solve a system of equations?

How do I know when a result is reasonable?

How does explaining my process help to understand a problem's solution better?

Critical Knowledge and Skills

Vocabulary

Vocabulary:

Consistent, Dependent, Elimination Method, Inconsistent, Independent, Linear Inequality Solution of an Inequality, Solution of a System of Linear Equations, Solution of a System of Linear Inequalities, Substitution Method, System of Linear Equations, System of Linear Inequalities

Learning Objectives

Solve systems of equations by graphing (A.REI.6)

Analyze special systems (A.REI.6)

Solve systems of equations using substitution (A.REI.6)

Solve systems by adding or subtracting to eliminate a variable (A.REI.5)

Choose the best method for solving a system of linear equations (A.REI.6)

Graph linear inequalities in two variables (A.REI.12)

Use linear inequalities when modeling real-world situations (A.REI.12)

Solve systems of linear inequalities by graphing (A.REI.12)

Model real-world situations using systems of linear inequalities (A.REI.12)

Resources

Desmos Linear Systems Bundle

3 Act Math: Stacking Cups

3 Act Math: Two Trains

Khan Academy: Systems of Equations

Khan Academy: Inequalities (systems & graphs)

3 Act Math: Popcorn Pandemonium

Standards

RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP11. Use technology to enhance productivity.

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.

9.1.8.C.5 Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages).

9.1.8.D.3 Differentiate among various investment options.

9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.7	Look for and make use of structure.
MA.A-REI.C	Solve systems of equations
MA.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.
MA.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.
MA.A-REI.D	Represent and solve equations and inequalities graphically
MA.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.