# Unit 2a-Systems of Equations and Inequalities

Content Area: **Math**
Course(s): **Algebra 1 ACC Honors**
Time Period: **Marking Period 1**
Length: **enVision Chapter 4, 12 days**
Status: **Published**

## Essential Questions

- How do you use systems of linear equations and inequalities to model situations and solve problems?

## Big Ideas

- Find a solution that satisfies two linear equations.
- Graph one or more linear inequalities in the coordinate plane.
- Find solutions that satisfy two linear inequalities.

## Cross-Curricular Integration

Integration Area: Language Arts

LA.8.W.8.2.A Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

LA.8.W.8.2.B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

LA.8.W.8.2.C Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

LA.8.W.8.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

LA.8.W.8.2.E Establish and maintain a formal style/academic style, approach, and form.

LA.8.W.8.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented.

LA.8.W.8.4 Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

LA.8.W.8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and

audience have been addressed.

LA.8.W.8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

LA.8.W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

LA.8.W.8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

LA.8.W.8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

LA.8.W.8.10 Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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.

Activity:
Slope/College/Savings project. Students will research various colleges and their tuition costs. Students will search for a job that will be able to assist in paying for a portion of the college tuition. Students will create tables and linear representations of the collected data and then discuss the data in an explanatory essay.

## Technology Integration

8.2.8.ETW.1 Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs.

Compare the cost of older model iPhones with newer models to determine when the cost of the repair would be more expensive than the newer model.

## Enduring Understandings

Reasoning with Equations & Inequalities

A.REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

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.

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.

A.REI.C.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.

A.REI.D10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

- Identifying Linear Functions

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, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★

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.

Creating Equations

A.CED.A3 [M] Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods

A.CED.A2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

## Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Pages 157, 164, 171

2. Reason abstractly and quantitatively. Pages 143, 150

3. Construct viable arguments and critique the reasoning of others. Pages 157

4. Model with mathematics. Pages 143,170,171

5. Use appropriate tools strategically. Pages 150

6. Attend to precision.

7. Look for and make use of structure. Pages 143, 150, 164, 171

8. Look for and express regularity in repeated reasoning. Page 157, 164