High School Algebra 1 Topics 4 - FCPS 2025-2026

Topic 4: System of Linear Equations and Inequalities	Estimate Time Frame: 10 blocks

Essential Standards: KY.HS.A.20, KY.HS.A.23, KY.HS.A.25, (Topic 5: KY.HS.F.4.b)
Supporting Standards: KY.HS.A.13, KY.HS.A.14, KY.HS.A.23, KY.HS.A.24, KY.HS.N.4, KY.HS.N.5, KY.HS.N.6

Assessment Resource: enVision Topic 4

FCPS Supporting Links	Additional Supporting Links
Pacing Guide	Kentucky Academic Standards
Standards Resources Crosswalk	KSA Blueprint
FCPS P-12 Mathematics Guidance Document	Target of the Standards – conceptual, procedural & application
FCPS Achievement & Trauma-Informed Strategies in the Classroom	Three-Reads Routine
	Notice and Wonder Routine
	MILC Resources: Topic 4 Systems of Linear Equations and Inequalities
	enVision Teacher Guide: page 140A to 140I for specific Topic 4 Focus-Coherence-Rigor

Big Ideas

Solve Systems of Equations by Graphing (including use of technology), Substitution or Elimination, Equations by Multiplication & by any method
Interpret solutions to Systems of Equations
Apply knowledge to solve real-world Systems of Equations

Essential Questions	Common Preconceptions/Misconceptions
How do you use systems of linear equations and inequalities to model situations and solve problems? How can the problem be solved, and why should one method be chosen over another? How does determining one solution, infinitely many solutions, or no solutions to an equation	Students frequently confuse the concept of each domain value being paired with one range value as also meaning each range value can only have one domain value. One way to illustrate this is to have at least 13 students match their names with their birth months. Every student will have exactly one birth month, but at least one month will be chosen twice. Students should consider if this is a function. This can also be seen in a table or in a diagram with arrows connecting the input and output.

assist in knowing the reasonableness of a final answer?

How does a point of intersection relate to the solution of systems of equations?

What are the key features of the graph of the absolute value functions?

Standards for Mathematical Practices	Kentucky Interdisciplinary Literacy Practices (KILP)
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning. ***enVision Teacher Guide: page 140D for specific Topic 4 Math Practice suggestions***	1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schemas to understand and create text. 3. View literacy experiences as transactional, interdisciplinary, and transformational. 4. Utilize receptive and expressive language arts to better understand self, others, and the world. 5. Apply strategic practices, with scaffolding and then independently, to approach new literacy tasks. 6. Collaborate with others to create new meaning. 7. Utilize digital resources to learn and share with others. 8. Engage in specialized, discipline-specific literacy practices. 9. Apply high-level cognitive processes to think deeply and critically about text. 10. Develop a literacy identity that promotes lifelong learning. *Incorporating texts into math instruction fosters interdisciplinary learning for a more engaging educational experience.*

Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Solve systems of equations.		
KY.HS.A.20 Solve systems of linear equations in two variables. a. Understand a system of two equations in two variables has the same solution as a new system	I am learning to understand the relationship between systems of linear equations in two variables and the concept of equivalent equations. • I can identify systems of linear equations in two variables and understand their components.	• Lesson 4-1 Solving Systems of Equations by **Graphing** • Lesson 4-2 Solving Systems of Equations by **Elimination**

formed by replacing one of the original equations with an equivalent equation.

b. Solve systems of linear equations with graphs, substitution, **and** elimination, focusing on pairs of linear equations in two variables.
MP.3, MP.6, KILP.5, KILP.7, KILP.9

Supporting Standard: [KY.HS.A.13](), [KY.HS.A.14](), [KY.HS.A.23](), [KY.HS.A.24]()
☐ *Conceptual*   ☐ *Procedural*   ☐ *Application*

- I can recognize that replacing one equation in a system with an equivalent equation results in a system with the same solution.
- I can apply mathematical reasoning to justify the steps taken in solving systems of linear equations.

- I am learning to solve systems of linear equations in two variables using various methods, including graphing, substitution, and elimination.
- I can solve systems of linear equations using graphing, substitution or elimination methods.
- I can interpret the solutions to systems of equations in one solution (expressed as an ordered pair), no solution, or infinitely many solutions.

- Lesson 4-3 Solving Systems of Equations by **Substitution**
- **3-Act Task:** Get Up There! P.170
- Desmos: [Linear Systems]()

Attending to the Standards for Mathematical Practice

Students use a variety of methods to solve systems of equations, understanding that tables and graphs may produce estimates rather than exact solutions (MP.6). Students construct a viable argument to justify their solution(s) in a system of equations. (MP.3)

Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Understand the concept of a function and use function notation.		
KY.HS.A.23 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. **MP.1, MP.4** Clarifications: Students make connections between algebra and geometry within this	We are learning to understand that the graph of an equation with two variables visually represents all the ordered pairs that make the equation true. - I can explain that a graph shows all the solutions to an equation. - I can check if a point is a solution to an equation. - I can find and plot solutions to an equation. - I can read solutions from a graph.	- Lesson 4-1 Solving Systems of Equations by **Graphing**

standard. Students acquire the basic understanding that the coordinates of the points of intersection of the graphs are the pairs of values of the variables that solve the system.	● I can connect equations, solutions, and their graphs.	

Attending to the Standards for Mathematical Practice

Students explain that the solutions of a system of equations or inequalities are all the points represented on the graph and therefore, where two functions overlap illustrates solutions to two functions (MP.1, MP.3). Students use technology to determine solutions to a system of linear inequalities (e.g., using DESMOS or graphing calculators) (MP.5).

Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Represent and solve equations and inequalities graphically.		
KY.HS.A.25 Graph linear inequalities in two variables. a. Graph the solutions to a linear inequality as a half-plane (excluding the boundary in the case of a strict inequality). b. Graph the solution set to a system of linear inequalities as the intersection of the corresponding half-planes. **MP.5, KILP.7, KILP.9** *Supporting Standard:* KY.HS.A.14, KY.HS.A.23, ☐ *Conceptual* ☐ *Procedural* ☐ *Application*	I am learning to graph linear inequalities in two variables. ● I can graph linear inequalities in two variables on a coordinate plane. ● I can identify the boundary line of the inequality and determine whether it should be included in the solution. ● I can shade the appropriate half-plane to represent the solution to the inequality, excluding the boundary for strict inequalities. I am learning that the solution to a system of inequalities lies in the region where the graphs overlap. ● I can graph the solution set for a system of linear inequalities. ● I can determine the intersection of the shaded regions from all inequalities in the system. ● I can shade the region corresponding to the intersection of the shaded regions from all inequalities, representing the solution set to	● Lesson 4-4 Linear Inequalities in Two Variables ● Lesson 4-5 Systems of Linear Inequalities ● Lesson 1-7 Absolute Value Equations and Inequalities ❗ May have been taught in Topic 1. ● ❗ Exclude Lessons 5-2: Piecewise-Defined Functions, 5-3: Step Functions, 5-4 Transformations of Piecewise-Defined Functions–KY.HS.F.4 b/g(+) are NOT Algebra 1 standards

	the system.	

Attending to the Standards for Mathematical Practice

Students use graphs to answer questions and/or make predictions for a given context (MP. 4). Students use technology to explore concepts of function families and show key features of the graph (MP. 5). Students compare and contrast different characteristics of functions to connect features of the graph with different real-world contexts (MP.6). Students manipulate expressions, being careful to preserve equivalence and describe why a particular expression provides insights into the function (MP.3, MP.6).

Supporting Standards

KY.HS.N.4 Use units in context as a way to understand problems and to guide the solution of multi-step problems; ★ **MP.5, MP.6**
a. Choose and interpret units consistently in formulas;
b. Choose and interpret the scale and the origin in graphs and data displays.

KY.HS.N.5 Define appropriate units in context for the purpose of descriptive modeling. ★ **MP.1, MP.6**

KY.HS.N.6 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. ★ **MP.2, MP.6**

KY.HS.A.13 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **MP.2, MP.5**

KY.HS.A.14 Create a system of equations or inequalities to represent constraints within a modeling context. Interpret the solution(s) to the corresponding system as viable or nonviable options within the context. **MP.4, MP.5**

KY.HS.A.23 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. **MP.1, MP.4**

KY.HS.A.24 Justify that the solutions of the equations $f(x) = g(x)$ are the x-coordinates of the points where the graphs of $y = f(x)$ and $y = g(x)$ intersect. Find the approximate solutions graphically, using technology or tables. ★ **MP.3, MP.5**

Vocabulary

Systems Vocabulary:
system of equations - Two or more linear equations in the same variables.
solution - The value of a variable that makes an equation true.
substitution - Replacement of a variable with an equal expression or constant.
intersection - The meeting of two lines/or segments or the two faces of a solid or any two geometric objects EX: 2 roads that cross each other have an intersecting point called an intersection.
solution - The value of a variable that makes an equation true.

substitution property - Replacement of a variable with an equal expression or constant.
system of equations - Two or more equations in the same variable.

Absolute Value Vocabulary: absolute value equations, absolute value inequalities, absolute value functions, piecewise functions

*Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. This example is not comprehensive.

** Mathematical Practices (A.MP. 1- 8) should be evidenced at some point throughout each unit, depending on the explored tasks. It is important to note that MP. 2 should support learning in every lesson.

*** Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to *all* standards in that group.