High School Algebra 1 Topic 1 - FCPS 2025-2026

Topic 1 : Solving Equations and Inequalities	**Estimate Time Frame: 12 blocks**
Essential Standards: KY.HS.A.12, KY.HS.A.15, KY.HS.A.16, KY.HS.A.18 **Supporting Standards:** KY.HS.A.1, KY.HS.N.3 (+), KY.HS.N.4, KY.HS.N.5, KY.HS.N.6 **Assessment Resources:** enVision Topic 1 and Formative Assessment Lesson **(FALs):** Solving Equations in One Variable and Interpreting Algebraic Expressions	

FCPS Supporting Links	**Additional Supporting Links**
Pacing Guide Standards Resources Crosswalk FCPS P-12 Mathematics Guidance Document FCPS Achievement & Trauma-Informed Strategies in the Classroom	Kentucky Academic Standards KSA Blueprint Target of the Standards - conceptual, procedural & application Three-Reads Routine Notice and Wonder Routine **MILC Resources - Topic 1: Solving Equations and Inequalities** ***enVision Teacher Guide: page 2A to 2I for specific Topic 1 Focus-Coherence-Rigor***

Big Ideas
Build upon experiences with operations with integers and fractions. Analyze and explain the process of solving a linear equation using the properties of equality. If an equation is true for all values of x, then it has infinitely many solutions; if it is not true for any value of x, then it has no solutions. Relate the process of solving an equation in one variable to solving inequalities.

Essential Questions	**Common Preconceptions/Misconceptions**
What general strategies can you use to solve simple equations? How can we solve for an unknown quantity or find an unknown in a real-world situation?	• Some students may miscalculate the slope. Remind students that the slope measures the steepness of a line, so the change in height comes first when you read slope as a fraction. • Some students may incorrectly interpret the value of b using (2,0) instead of (0,2). Have students check whether the equation validates their coordinates for representing the y-intercept.

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How can linear functions be used to model situations and solve problems? How do situations modeled by equations differ from those that can be modeled using inequalities?	• Some students often reverse the independent and dependent variables y, when given data. • Students not only simplify problems but also need to use appropriate vocabulary, such as terms, coefficients, and degrees, as they describe their process. • Students will need to describe the meaning of parts of an expression, such as a particular term or coefficient, and also explain the meaning of the full expression. • Students will fluently manipulate expressions into equivalent forms based on patterns they have noticed across problems. • It is recommended that students use Algebra Tiles and Algeblocks.
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 2D for specific Topic 1 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: Create equations that describe numbers or relationships.		
KY.HS.A.12 Create equations and inequalities in one variable and use them to solve problems. MP.1, MP.4, KILP.1, KILP.2, KILP.6 ☐ Conceptual ☐ Procedural ☐ Application	I am learning to write equations and inequalities. • I can create accurate equations and inequalities to represent given situations. • I can solve equations and inequalities in one variable using the properties of equality.	• Pre-Assessment: Real-Number System, number line, order of operations, solving one-step equations

Clarifications: Students solve problems using the addition, subtraction, multiplication, and division properties of equations and inequalities. These equations may arise from linear and quadratic functions and simple rational and exponential functions. *Supporting Standards: KY.HS.N.3 (+), KY.HS.N.4*	• I can explain that each step in solving a linear equation follows from the equality in the previous step.	• ❗1-1 Operations on Real numbers: standard N.3(+) • Lesson 1-2 Solving Linear Equations • Formative Assessment Lesson (FAL): Interpreting Algebraic Expressions **OR** • Formative Assessment Lesson (FAL): Interpreting Algebraic Expressions on **Desmos** **OR** • Formative Assessment Lesson (FAL): Interpreting Algebraic Expressions in a Stations format
KY.HS.A.15 Rearrange formulas to solve a literal equation, highlighting a quantity of interest, using the same reasoning as in solving equations. MP.2, MP.7, KILP.1, KILP.6, KILP.9 ❑ Conceptual ❑ Procedural ❑ Application Clarifications: Students encounter scenarios where they rewrite formulas/equations for variables different from the commonly used formulas. An example may include, but is not limited to, students rearranging the area of a rectangle (A = bh) to highlight the base value b rather than the total area.	I am learning to rearrange formulas using variables and numbers to solve literal equations. • I can identify literal equations and understand their components. • I can rearrange formulas by applying inverse operations to isolate the desired variable. • I can solve literal equations accurately to find the specified quantity of interest. • I can use formulas and equations to solve problems and interpret the solutions.	• Lesson 1-4 Literal Equations and Formulas • Literal equations could be taught before solving basic-level equations to reinforce ideas from Intro to Physics.

Supporting Standard: KY.HS.N.4		
Attending to the Standards for Mathematical Practice		
Students interpret a story or situation into an equation or inequality, connecting the terms and symbols within the equation or inequality to the context (MP.1) and relate how the solution to the equation or inequality connects back to the original problem (MP.4). Students utilize technology to graph equations and use the graph to describe qualitatively and quantitatively the relationship between variables (MP.5). Students explain when they would opt for different equivalent forms of an equation (MP.7).		
Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Understand solving equations as a process of reasoning and explain the reasoning.		
KY.HS.A.16 Understand each step in solving a simple equation, following 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. MP.1, MP.3, KILP.1, KILP.6, KILP.9 ☐ *Conceptual* ❑ *Procedural* ❑ *Application* Clarifications: Students reason with and about collections of equivalent expressions to see how all the expressions in the collection are linked together through the properties of operations.	I am learning to justify equivalence in each step of solving a simple equation. ● I can identify the steps involved in solving a simple equation and understand the logical progression from one step to the next. ● I can solve an equation and apply the properties of equality to justify each step in the solution process. ● I can identify whether linear equations have one solution, infinitely many solutions, or no solution. ● I can construct clear and coherent arguments to justify my chosen solution method, explaining how each step logically leads to the next.	● Lesson 1-2 Solving Linear Equations ○ 1-2 Model and Discuss to provide real-world context. ● Lesson 1-3 Solving Linear Equations with a Variable on Both Sides ○ 1-2 and 1-3 Lesson Quiz as a partner activity or in-class problem-solving opportunity
Attending to the Standards for Mathematical Practice		
Students use properties, such as the distributive property of multiplication over addition, to describe why two expressions are equivalent. They explain their approach to a problem and critique the solutions of others, comparing the different methods in terms of whether they are accurate and efficient (MP.3). Students approximate solutions with technology (MP.5). Students use the structure of an equation (rational, radical) to determine an efficient strategy for finding a solution, if one exists (MP.7).		
Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations

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Cluster: Solve equations and inequalities in one variable.		
KY.HS.A.18 Solve linear equations and inequalities in one variable, including literal equations with coefficients represented by letters. MP.2, MP.7, KILP.2, KILP.5, KILP.9 ☐ *Conceptual* ☐ *Procedural* ☐ *Application* Clarifications: Students use all properties of both equations and inequalities to solve for one variable. *Supporting Standards: KY.HS.N.4, KY.HS.N.6, KY.HS.A.1, KY.HS.A.16,*	I am learning to solve literal equations where coefficients are represented by letters. ● I can manipulate literal equations by isolating the desired variable using inverse operations. ● I can solve literal equations with coefficients represented by letters by applying the same reasoning as in solving equations. I am learning to solve equations and inequalities in one variable, ● I can identify linear equations and inequalities in one variable and understand their components. ● I can apply algebraic methods to solve linear equations and inequalities. ● I can interpret solutions to inequalities within the context.	● Lesson 1-3 Solving Linear Equations with a Variable on Both Sides ○ Solving Equations Formative Assessment ● Lesson 1-5 Solving Inequalities in One Variable ● Lesson 1-6 Compound Inequalities ● Lesson 1-7 Absolute Value Equations and Inequalities ❗ Could also be taught with systems. ● Formative Assessment Lesson **(FAL)** : Solving Equations in One Variable ● Formative Assessment Lesson (FAL): Solving Equations in One Variable on **Desmos**

Attending to the Standards for Mathematical Practice
Students reason about which symbolic representation is needed to focus on a particular feature and then efficiently rewrite literal equations to feature that characteristic (MP.2). Students analyze the structure of a quadratic equation to determine an efficient strategy to find a solution (MP.7).

Supporting Standards
KY.HS.A.1 Interpret expressions that represent a quantity in terms of its context. ★

a. Interpret parts of an expression, such as terms, factors, and coefficients.
b. Interpret complicated expressions, given a context, by viewing one or more of their parts as a single entity. **MP.2, MP.6**

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**

KY.HS.N.3 (+) Justify why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. **MP.3, MP.6 (Lesson 1-1)**

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**

Vocabulary

Element of a set - distinct object that belongs to that set. If x is an element of set A, this is denoted by $x \in A$.
Real numbers - denoted by R, is the union of the set of rational numbers and the set of irrational numbers. Real numbers can be thought of as all points on a continuous number line. They include all integers, fractions, terminating and non-terminating repeating decimals (rational numbers), and non-terminating, non-repeating decimals (irrational numbers).
Set - A set is a well-defined collection of distinct objects. The objects in a set are called its elements or members.
Subset - Set A is a subset of set B, denoted by $A \subseteq B$, if every element in A is also an element in B. If $A \subseteq B$ and there is at least one element in B that is not in A, then A is a proper subset of B, denoted by $A \subset B$.
Identity - an equation that is true for all values of the variables for which the expressions in the equation are defined. It represents a fundamental equivalence between two algebraic expressions.
Formula - an equation that expresses a relationship between two or more variables. It often describes a general rule or principle used for calculations.
Literal equation - an equation containing two or more variables.
Compound inequality - formed by combining two or more simple inequalities using the logical connectives "and" or "or".
equation - A mathematical statement that says that two expressions have the same value; any number sentence with an =. EX: 4+2=3+3
expression - A finite combination of symbols that are well-formed according to the rules applicable in the context at the end.
coefficient – A constant that multiplies a variable.
variable – A letter representing a number value in an expression or an equation. EX: "x" in x+2=4.

inequality - A mathematical expression that shows that two quantities are not equal.
slope - a constant rate of change

*****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.