Grade: 8 FCPS 2025-2026 Math Grade 8 Topic 2

8th Grade Topic 2: Analyze and Solve Linear Equations	Estimate Time Frame: 23 days
Essential Standards: 8.EE.7b, 8.EE.5, 8.EE.6 Supporting Standard: 8.EE.7a Assessment Resources: enVision Topic 2 and Formative Assessment Lessons (FAL): Laws of Arithmetic	

FCPS Supporting Links	Additional Supporting Links
Pacing Guide 8th Grade Topic 2 Standards Resource with Sample Formative Assessments enVision 8th Grade Topic 2 Standards Crosswalk Resource 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 2: Analyze and Solve Linear Equations** ***enVision Teacher Guide: page 82A to 82D for specific Topic 2 Focus-Coherence-Rigor***

Big Ideas
Analyze and solve linear equations.

Essential Questions	Common Preconceptions/Misconceptions
How can I use a model to determine one solution, infinitely many solutions, or no solutions with equations? How can we analyze connections between linear equations and use them to solve problems? How can the unit rate be found from a verbal description, a table, a linear graph, or an equation? What does the slope measure? How can knowing the slope and y-intercept help me solve linear relationship problems?	Solving Linear Equations- Keeping the equation balanced by performing operations on both sides; Distribute to all terms in the parentheses. Slope - students get confused when plotting points (x first, then y) and graphing equations with slope (y first, then x). Slope Intercept Form- students often misinterpret slope and y-intercept in the y=mx+b equation. Graphing Slope Intercept Form- students often graph the y-intercept on the x-axis.

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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 82E for specific Topic 2 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: Analyze and solve linear equations and pairs of simultaneous linear equations.		
KY.8.EE.7b Solve linear equations in one variable. ☐ **Conceptual** ☐ **Procedural** ❑ Application b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. ❑ Conceptual ☐ **Procedural** ❑ Application	We are learning how to solve linear equations. • I can use inverse operations to move all variable terms to one side of the equation and constant terms to the other. • I can combine like terms to solve equations. • I can use inverse operations to isolate the variable. • I can use the Distributive Property to expand equations with parentheses. • I can solve a multi-step equation. • I can solve an equation with variables on	• Topic 2 Lesson 2-1 • Topic 2: Let's Investigate! It All Balances Out • Brainingcamp Task (Lesson 2-1) "Combining Like Terms on One Side" • Topic 2 Lesson 2-2 • Brainingcamp Task (Lesson 2-2) "Variables on Both Sides" • Topic 2 Lesson 2-3 • Brainingcamp Task

Supporting Standard KY.8.EE.7a Clarifications: Building upon skills from grade 7, students combine like terms on the same side of the equation and use the distributive property to simplify the equation when solving. The emphasis in this standard is also on using rational number coefficients. Solutions of certain equations may elicit infinitely, many, or no solutions. Students should be exposed to equations involving fractions and decimals. Coherence KY.7.EE.1→ KY.8.EE.7→ KY.HS.A.18 **MP.2, MP.3, MP.7, KILP.5, KILP.6, KILP.8**	both sides.	(Lesson 2-3) "One Variable - How Many Solutions?" • enVision Language Support Handbook • Desmos: Solving Equations • Formative Assessment Lesson (FAL): Laws of Arithmetic • MILC - BUMP Solving Equations • MILC - Card Sort • MILC - Slope 4 in a Row
Cluster: Understand the connections between proportional relationships, lines, and linear equations.		
KY.8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in various ways. ☐**Conceptual** ☐**Procedural** ☐**Application** Clarifications: Emphasis is placed on relating previous knowledge of unit rate to slope in tables, graphs, equations, and sets of ordered pairs, as well as comparing the slopes of two different proportional relationships. Other ways to represent proportional relationships include tables, graphs, equations, or sets of ordered pairs.	We are learning to graph proportional relationships. • I can graph a proportional relationship with a table, equation, or set of ordered pairs. • I can interpret the unit rate as the slope of a graph. We are learning to compare proportional relationships. • I can represent proportional relationships using different representations, including graphs, tables, ordered pairs, and equations. • I can compare proportional relationships represented in different ways.	• Topic 2 Lesson 2-5 • BrainingCamp Tasks (Lesson 2-5) "The Race! - Running" (Lesson 2-5) "The Race! - Cycling" • 3-Act Task: Powering Down • enVision Language Support Handbook

Coherence: KY.7.RP.2→ KY.8.EE.5→ KY.HS.A.23 **MP.2, MP.3, MP.4, KILP.2, KILP.3, KILP.9**	• I can compare the slope of a line between two different proportional relationships.	
KY.8.EE.6 Use similar triangles to explain why the slope, m, is the same between any two distinct points on a non-vertical line in the coordinate plane; Know the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. ☐ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** Using the properties of similar triangles, demonstrate that the slope between any two pairs of points on a non-vertical line creates the same rise-run ratio when simplified. Understand y=mx and y=mx+b differ in that y=mx only has the possibility of 0 being the y-intercept, and that y=mx+b has infinite possibilities, including 0, for the y-intercept depending on the value of b. Coherence KY.7.RP.2→ KY.8.EE.6→ KY.HS.A.23 **MP.3, MP.4, MP.7, KILP.1, KILP.8**	We are learning about the slope of a line. • I can identify characteristics of similar triangles. • I can use similar triangles to explain why the slope m is the same between two distinct points on a non-vertical line in the coordinate plane. • I can find the slope of a line. We are learning to understand how different forms of linear equations are created. • I can determine the y-intercept of a line. • I can analyze patterns for points on a line that pass through the origin. • I can derive an equation of y = mx for a line through the origin. • I can analyze patterns for points on a line that do not pass through or include the origin. • I can derive an equation of y=mx + b for a line intercepting the vertical axis at b (the y-intercept).	• Topic 2 Lesson 2-6 • Topic 2: Let's Investigate! Rise to the Top (replaces example 1 from Lesson 2-6) • Brainingcamp Task (Lesson 2-6) "What Does a Proportion Look Like?" • Topic 2 Lesson 2-7 • Lesson 2-6 merged with Lesson 2-7 • Brainingcamp Tasks (Lesson 2-7) "Moving Day" (Lesson 2-7) "Where Do We Begin?" • Lesson 2-8 merged with Lesson 2-9 • enVision Language Support Handbook

Attending to the Standards for Mathematical Practice

Students represent real-world situations symbolically (MP.4). Students identify necessary quantities from a context and represent the relationship as an equation, a table, and a graph. Students analyze the various representations, draw conclusions, and/or make predictions (MP.3).

Once a solution or prediction has been made, students reflect on whether the solution makes sense in the context presented(MP.4). One example is when students determine how many buses are needed for a field trip. As this is not an exact solution, students must interpret their fractional solution and make sense of it as it applies to the real world.
Mathematical modeling is a process that uses mathematics to represent, analyze, make predictions, or otherwise provide insight into real-world phenomena.
Students use the structure of an equation to make sense of the information in the equation (MP.7). For example, students write equations that represent the constant rate of motion for a person walking. In doing so, they interpret an equation such as y = ⅜ x as the total distance a person walks, y, in x amount of time, at a rate of ⅜.
Students look for patterns or structure in tables and show that a rate is constant; students also understand that a lack of a pattern represents a non-constant (non-linear) rate.

Supporting Standards

KY.8.EE.7a Students solve linear equations in one variable, including cases with one solution, infinite solutions, and no solutions. Students show examples of each case by successfully transforming an equation into simpler forms. Some linear equations require students to expand expressions by using the distributive property and to collect like terms (MP.2, MP.7). Solving pairs of simultaneous linear equations builds on the skills and understandings students used to solve linear equations with one variable and systems of linear equations may also have one solution, an infinite number of solutions, or no solutions (MP.2, MP.3). Students discover these cases as they graph systems of linear equations and solve algebraically. **Lesson 2-4**

☐ **Conceptual** ☐ **Procedural** ❑ Application

Vocabulary

input - The number substituted for the variable in a function or rule machine.
linear function - A function defined by f(x) = mx + b.
non-linear - Not on a line.
non-linear association- Not having a resemblance to a line.
output - The number resulting from a function or rule machine.
rate of change - The speed at which a variable changes over a specific period. Also, the slope of a function is the same.

*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 with 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.