High School Geometry FCPS 2025-2026 Math Unit Framework Topic 2

Geometry Topic 2: Parallel and Perpendicular Lines	Estimate Time Frame: 6 Block Days
Essential Standards: G.1a, G.1b, G22, G.6 Assessment Resource: enVision Topic 2	

FCPS Supporting Links	Additional Supporting Links
Pacing Guide enVision Geometry 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 - Parallel and Perpendicular Lines** ***enVision Geometry Teacher Guide: page 68A to 68D for specific Topic 2 Focus-Coherence-Rigor***

Big Ideas
Algebra and the coordinate plane can be used to solve problems involving geometric concepts. Congruent or supplementary angles formed by two lines and a transversal can be used ot prove the lines are parallel.

Essential Questions	Common Preconceptions/Misconceptions
•What relationships are formed when a transversal cuts parallel lines? •How can I prove lines are parallel? •How can I use slope to solve problems involving parallel and perpendicular lines? •What are some strategies to find unknown angle measures?	• Ensure students understand the definition of parallel lines as “two coplanar lines that never intersect.” • Emphasize that opposite reciprocals multiply to = – 1. (Also, the definition of perpendicular slope.) • **STEM** “Build a Roof” (construction/pitch) recommended (include the 2-minute NBC video)

Theorems/Postulates: • Same-Side Interior Angles Postulate • Alternate Interior Angles Theorem • Corresponding Angles Theorem • Alternate Exterior Angles Theorem • Parallel lines have equal slopes • Perpendicular lines have opposite reciprocal slopes (in other words, the product of slopes equals -1)	
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 68D for specific Math Practice suggestions***	1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schema 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: Experiment with transformations in the plane.		
KY.HS.G.1 Know and apply precise definitions of the	We are learning to describe the properties of	• Topic 2-1 (G.1.a)

language of Geometry: a. **Understand** properties of line segments, angles, and circles. b. **Understand** the properties of and differences between perpendicular and parallel lines. **MP.3, MP.6, KILP.3, KILP.5** *Supporting Standard: KY.HS.G.8, (lesson 2-2), KY.HS.G.22, KY.HS.N.5, KY.HS.N.6* ☐ Conceptual ❑ Procedural ❑ Application	perpendicular and parallel lines. ● I can define parallel and perpendicular lines. ● I can describe the properties of parallel and perpendicular lines ● I can identify four pairs of angles formed by coplanar lines and a transversal ● I can solve problems involving the measures of special angle pairs formed by parallel lines	● Topic 2-2 (G.1.b) ● Topic 2-4 (G.1.b) Make sure to define parallel lines as "two coplanar lines that never intersect" (enVision does not define this since it is a middle school standard and will be assessed). **3 ACT Math Task (one per unit) -** Parallel Paving Company (after 2-4)
Cluster: Use coordinates to prove simple geometric theorems algebraically.		
KY.HS.G.22 Justify and apply the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. **MP.3, MP.7** *Supporting Standard: KY.HS.G.1, KY.HS.G.31* ☐ Conceptual ❑ Procedural ❑ Application	We are learning to apply the slope criteria for parallel and perpendicular lines. ● I can define parallel lines and identify the slope criteria for parallel lines. ● I can define perpendicular lines and identify the slope criteria for perpendicular lines. ● Based on their slopes, I can determine whether two lines are parallel or perpendicular. ● I can **apply** the slope criteria to determine the equations of parallel or perpendicular lines. ● Using the slope criteria, I can solve geometric problems involving parallel and perpendicular lines. ● Using the slope criteria, I can **justify** my	● Topic 2-2 ● Desmos Lesson Check - Proving Lines Parallel ● Desmos Lesson Check - 2-column Proofs ● Topic 2-3 Supplement classifying triangles by sides and angles ● Topic 2-4 Given a diagram, students will justify their reasoning as to whether or not the lines are parallel.

	reasoning when determining whether lines are parallel or perpendicular. • I can classify triangles by their sides and angles. • I can find missing angles in triangles using the Triangle Angle-Sum Theorem. • I can find missing angles in triangles using the Exterior Angle Theorem. • I can find the slope between two points. • I can use slope to identify parallel and perpendicular lines in the coordinate plane. • I can write equations of parallel and perpendicular lines.	This standard also requires students to understand how to find the equation of a line parallel or perpendicular to a given line that passes through a given point.
Cluster: Prove geometric theorems.		
KY.HS.G.6 Apply theorems for lines, angles, triangles, and parallelograms. **MP.2, MP.3, KILP.6, KILP.9** *Supporting Standards: KY.HS.G.7, KY.HS.G.11, KY.HS.G.22, KY.HS.G.29* ☐ Conceptual ☐ Procedural ❑ Application NOTE ** Parallelograms in Topic 6	We are learning to apply previously learned definitions, theorems, postulates, and properties of lines, angles, and triangles to draw conclusions and make inferences. • I can identify four pairs of angles formed by coplanar lines and a transversal. • I can solve problems involving the measures of special angle pairs formed by parallel lines. • I can prove that two lines are parallel.	• Topic 2-1 • Topic 2-2
Attending to the Standards for Mathematical Practice		
Students experiment with lines, angles, triangles, and parallelograms to make connections and conjectures about their properties (MP.7), using dynamic software when appropriate (MP.5). Students describe the connections between geometric theorems and their algebraic formulas (MP.2). They intentionally manipulate coordinates appropriately, fluently selecting criteria and formulas for a given context (MP.7).		

Supporting Standards

Emphasis is on congruence transformations that preserve corresponding congruent lines, segments, and angles.

KY.HS.G.7 Prove theorems about geometric figures.
a. Construct formal proofs to justify lines, angles, and triangle theorems.
b. (+) Construct formal proofs to justify theorems for parallelograms. **MP.6, MP.7**

KY.HS.G.8 Create and apply geometric constructions.
a. Make formal geometric constructions with a variety of tools and methods.
b. Apply basic construction procedures to construct more complex figures.

KY.HS.G.11 Understand theorems about triangles.
a. Apply theorems about triangles. **MP.1, MP.3**

KY.HS.G.29 Use geometric shapes, their measures, and their properties to describe objects in real-world settings. **MP.1, MP.4**

KY.HS.G.31 Apply geometric methods to solve design problems. ★ **MP.1, MP.4**

Vocabulary

parallel, coplanar, transversal, corresponding angles, alternate exterior angles, alternate interior angles, same-side interior angles

*****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.