

Unit 1

Proof, Parallel and Perpendicular Lines

Geometry

Unit Description:

Students study formal definitions of basic figures and are introduced to mathematical proofs by applying these definitions. Students will extend their understanding of characteristics of angles and parallel and perpendicular lines then explore practical applications.

Standards for Mathematical Practice

- 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.

Louisiana Student Standards for Mathematics (LSSM)

Parts of standards that are addressed in later units have been ~~crossed out~~.

G-CO: Congruence	
A. Experiment with transformations in the plane.	
G-CO.A.1	Know precise definitions of angle, circle , perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc .
C. Prove and apply geometric theorems.	
G-CO.C.9	Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>
G-GPE: Expressing Geometric Properties with Equations	
B. Prove and apply theorems involving similarity	
G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
G-GPE.B.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

Enduring Understandings:

Essential Questions:

- Proof and congruence are not exclusive to mathematics and the logical processes with defining principles can be applied in various life experiences.
- Communicating mathematically valid arguments are central to the study of mathematics.
- Characteristics, properties, and mathematical arguments about geometric relationships can be analyzed and developed using logical and spatial reasoning.

- How does geometry explain or describe the structure of our world?
- How can reasoning be used to establish or refute conjectures?
- How does my understanding of algebraic principles help me solve geometric problems?