



Geometry Level 1 - Unit A - Introduction to Geometry

Unit Focus

This unit introduces students to the majority of terminology used in Geometry. Transformations, logical thinking and proofs are all part of the unit and will be referred to throughout the course. Students will be able to complete a two-column geometric proof by the end of the unit. Geometric software, along with compass and straightedge, will be used for constructions.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 9-12 - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS.MATH.CONTENT.HSA.CED.A.1) - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS.MATH.CONTENT.HSA.REI.B.3) - 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. (CCSS.MATH.CONTENT.HSG.CO.A.1) - Prove theorems about lines and angles. (CCSS.MATH.CONTENT.HSG.CO.C.9) - Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). (CCSS.MATH.CONTENT.HSG.CO.D.12) - Find the point on a directed line segment between two given points that partitions the segment in a given ratio. (CCSS.MATH.CONTENT.HSG.GPE.B.6) - Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). (CCSS.MATH.CONTENT.HSS.CP.A.1)	<i>Students will be able to independently use their learning to...</i> T1 draw conclusions about graphs, shapes, equations, or objects. T2 justify reasoning using clear and appropriate mathematical language. T3 work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Mathematicians analyze characteristics and properties of geometric shapes to develop mathematical arguments about geometric relationships. U2 Mathematicians compare the effectiveness of various arguments, by analyzing and critiquing solution pathways U3 Mathematicians flexibly use different tools, strategies, and operations to build conceptual knowledge or solve problems.	<i>Students will keep considering...</i> Q1 How can I use symbols to communicate? Q2 How does classifying bring clarity? Q3 How can I use what I know to help me find what is missing? Q4 What do I need to support my answer?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 in Euclidian Geometry points, lines and planes are undefined K2 that lines and planes are sets of points K3 how to identify congruent segments and angles on a diagram with tic marks	<i>Students will be skilled at...</i> S1 naming and recognizing points, lines, rays, angles, line segment, triangles S2 finding the distance between two points on a number line using subtraction and absolute values

Stage 1: Desired Results - Key Understandings

- Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. (CCSS.MATH.CONTENT.HSS.CP.A.5)
- Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. (CCSS.MATH.CONTENT.HSS.CP.B.6)
- Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model. (CCSS.MATH.CONTENT.HSS.CP.B.7)

- Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1)
- Construct viable arguments and critique the reasoning of others. (CCSS.MATH.MP.3)
- Attend to precision. (CCSS.MATH.MP.6)
- Look for and make use of structure. (CCSS.MATH.MP.7)

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- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)
- Collective Intelligence: Working respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. (POG.3.1)

K4 what can be assumed from a diagram and what cannot
K5 the sum of the lengths of any two sides of a triangle is greater than the length of the third side
K6 the definition of congruence in terms of transformations
K7 that a counterexample can show that a conclusion is false
K8 postulate and theorems are not always reversible
K9 definitions are always reversible
K10 that if a conditional statement is true, then the contrapositive of the statement of the statement is also true
K11 the Addition, Subtraction, Multiplication and Division Property for Angles and Segments
K12 that vertical angles are congruent
K13 which assumptions we can and cannot make from a diagram
K14 Vocabulary: point, line, segment, ray, endpoints, angles, sides, vertex, union, intersection, acute, right, obtuse, straight, collinear, noncollinear, theorem, proof, bisector, midpoint, trisect, trisection point, postulate, definition, conditional statement, implication, hypothesis, conclusion, converse, negation, contrapositive, perpendicular, probability, opposite rays

S3 correctly interpreting geometric diagrams
S4 converting between degrees, minutes and seconds and decimal degrees
S5 If two angles are straight(right) angles, then they are congruent.
S6 writing the converse, negation, inverse, and contrapositive of a conditional statement
S7 using the chain rule to draw conclusions
S8 finding the complement or supplement of an angle given in degrees, minutes, seconds
S9 solving algebraic problems involving angles
S10 using theorems about angles and segments to solve basic proofs
S11 using transitive and substitution property in basic proofs
S12 constructing the copy of a segment
S13 constructing the copy of an angle