

FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Geometry **Unit Name: Beyond a Shadow of a Doubt: Logic and Proof**

Quality Core Objectives:

Unit 3 Beyond a Shadow of a Doubt: Logic and Proof	
B.1. Mathematical Processes	a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems
	b. Use a variety of strategies to set up and solve increasingly complex problems
	c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships
	d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly
	f. Make mathematical connections among concepts, across disciplines, and in everyday experiences
	h. Apply previously learned algebraic concepts in geometric contexts
C.1. Logic and Proof	a. Use definitions, basic postulates, and theorems about points, segments, lines, angles, and planes to write proofs and to solve problems
	b. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions
	c. Identify and write conditional and biconditional statements along with the converse, inverse, and contrapositive of a conditional statement; use these statements to form conclusions
	e. Read and write different types and formats of proofs including two-column, flowchart, paragraph, and indirect proofs
D.2. Application (From English 10 standards)	c. Give impromptu and planned presentations (e.g., debates, formal meetings) that stay on topic and/or adhere to prepared notes
	g. Actively participate in small-group and large-group discussions, assuming various roles

Purpose of the Unit: To use inductive and deduction reasoning, to develop logical statements, and use geometric relationships to solve problem and construct proofs.

Prerequisites: Students should be able to simplify algebraic expressions and solve algebraic equations. Students should also know material taught in previous units of the course (particularly Unit One)

Daily Lesson Guide

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	B.1.d, B.1.h, C.1.b, C.1.c	How do I use inductive reasoning? How do I write conditional statements?	Look For and Make Use of Structure – Students will discern numeric patterns in geometric figures.	Clear/Modeled Expectations (Inductive Reasoning Discussion)	Opener – ACT (Probability/Statistics) Inductive Reasoning Discussion Homework – p67-68 (1, 2, 4, 5, 10-13, 16-28, 30)
2	B.1.c, B.1.d, B.1.f, C.1.a, C.1.b, C.1.c	How do I write conditional statements? How do I write the converse, inverse, and contrapositive of a conditional statement? How do I write a biconditional statement?	Attend to Precision – Students will both make explicit use of conditional terms, such as “contrapositive,” and find the truth value of the different permutations of verbal conditionals.	Novelty and Variety (Math and History Application: Lewis Carroll Clocks)	Opener – ACT (Probability/Statistics) Math and History Application : Lewis Carroll Clocks Homework – p74-77 (2-28 even, 35, 36)
3	B.1.a, B.1.f, C.1.b	How do I use deductive reasoning? How do I apply the Law of Detachment? How do I use the Law of Syllogism?	Reason Abstractly and Quantitatively – In their study of the Law of Syllogism and Law of Detachment, students will decontextualize verbal statements and represent them with symbols, allowing them to manipulate statements more freely. They will also contextualize, or pause and reflect on whether	Nonlinguistic Representation (Cartoon Images)	Opener – ACT (Probability/Statistics) Cartoon Images Homework – p82-83 (1-10, 12-18 even)

			these manipulations are appropriate.		
4	B.1.c, D.2.g	Do I understand the point, line and plane postulates?	Model with Mathematics – Students will use statements about geometric principles to make diagrams and descriptions.	Nonlinguistic Representation (Postulate Study Brochure) Learning with Others (Postulate Study Brochure)	Opener – ACT (Probability/Statistics) Postulate Study Brochure Homework – p91-93 (1, 2, 4, 5, 8 – 24, 30-38 even)
5	B.1.a, B.1.b, B.1.d, B.1.h, C.1.a, C.1.b, C.1.c	How do I justify the steps I take when I solve an equation?	Construct Viable Arguments and Critique the Reasoning of Others – Students will write a two-column proof that will build a logical progression of statements to establish the truth of a conjecture. They will also justify their conclusions step by step.	Clear/Modeled Expectations (Example Problems)	Opener – ACT (Probability/Statistics) Example Problems Homework – p100-101 (2-20 even)
6	B.1.a, B.1.b, B.1.d, B.1.h, C.1.a, C.1.b, C.1.c	How do I use the reflexive, symmetric, and transitive properties during analysis and justification?	Construct Viable Arguments and Critique the Reasoning of Others – Students will write a two-column proof that will build a logical progression of statements to establish the truth of a conjecture. They will also justify their conclusions step by step.	Clear/Modeled Expectations (Unit Three Quiz) Nonlinguistic Representation (Property Graphic Organizer)	Opener – ACT (Probability/Statistics) Unit Three Quiz (Summative) Property Graphic Organizer (Reflexive, Symmetric, Transitive) Homework – p101 -102 (21-27, 28, 33)
7	B.1.a, B.1.b, B.1.d, B.1.h, C.1.a, C.1.b, C.1.c, C.1.e	How do I prove geometric situations involving segments and angles?	Construct Viable Arguments and Critique the Reasoning of Others – In writing proofs on the congruence of certain segments and angles, students will communicate their reasoning clearly to others using the two-column proof as well as the flow proof.	Novelty and Variety (Real-Life Application: When Will I Ever Use This?)	Opener – ACT (Probability/Statistics) Real-Life Application: When Will I Ever Use This? Homework – p108 (2, 4, 5-12)
8	B.1.a, B.1.b, B.1.d, B.1.h, C.1.a, C.1.b, C.1.c, C.1.e, D.2.c, D.2.g	How do I prove geometric situations involving segments and angles?	Construct Viable Arguments and Critique the Reasoning of Others – In writing proofs on the congruence of certain segments and angles, students will communicate their reasoning clearly to others using the two-column proof as well as the flow proof.	Learning with Others (Geometric Proof Groups) Construct Viable Arguments and Critique the Reasoning of Other (Geometric Proof Groups)	Opener – ACT (Probability/Statistics) Geometric Proof Groups Homework – p108-110 (16, 18, 22, 24, 26)

9	B.1.a, B.1.b, B.1.d, B.1.h, C.1.a, C.1.b, C.1.c, C.1.e	How do I prove situation involving angle pairs?	Construct Viable Arguments and Critique the Reasoning of Others – In writing proofs on the congruence of certain segments and angles, students will communicate their reasoning clearly to others using the two-column proof as well as the flow proof.	Clear/Modeled Expectations (Example Problems)	Opener – ACT (Probability/Statistics) Example Problems Homework - P119-121 (2-14 even, 17-21, 22-28 even, 36, 42)
10	B.1.a, B.1.b, B.1.c, B.1.d, B.1.f, B.1.h, C.1.a, C.1.b, C.1.c, C.1.e, D.2.c, D.2.g	How do I use inductive and deductive reasoning? How do I use geometric relationships to solve problems? How do I proof geometric situations involving segments and angles?	Construct Viable Arguments and Critique the Reasoning of Others – In writing proofs on the congruence of certain segments and angles, students will communicate their reasoning clearly to others using the two-column proof as well as the flow proof.	Learning with Others (Geometric Proof Groups) Construct Viable Arguments and Critique the Reasoning of Other (Geometric Proof Groups)	Opener – ACT (Probability/Statistics) Geometry Proof Groups
11	B.1.a, B.1.b, B.1.c, B.1.d, B.1.f, B.1.h, C.1.a, C.1.b, C.1.c, C.1.e, D.2.c, D.2.g	How do I use inductive and deductive reasoning? How do I use geometric relationships to solve problems? How do I proof geometric situations involving segments and angles?			Unit Three Assessment (Summative)
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