Geometry Learning Module 2

Title of Module	Reasoning and Proof	Grade Level	9-12
Curriculum Area	Mathematics	Time Frame	15 days

Desired Results

Best Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure (Deductive Reasoning)
8. Look for and express regularity in repeated reasoning.

Transfer Goals

Students will be able to independently use their learning to...
- Connect old problem solving techniques to new curriculum.
- Connect new material to real world applications.
- Create viable mathematical arguments and use them to critique the arguments of fellow classmates.

Key Learnings/Big Ideas

Students will learn to:

1) Use inductive and deductive reasoning

2) Understand geometric relationships in diagrams

3) Supply reasons for proofs of geometric relationships

Content and Reading and Writing Standards

Core Standards
CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.
CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically
CC.2.3.HS.A.14 Apply geometric concepts to model and solve real world problems.

Essential Questions	Vocabulary (Best Practices) Utilize concepts & competencies to add to vocabulary

Unit EQ: How is logical reasoning important to Geometry? **LEQ:** 1) How do you use inductive reasoning in mathematics? 2) How do you write the three related conditionals from a conditional statement? 3) How do you determine if a series of statements uses the Law of Detachment or the Law of Syllogism? 4) How can you identify postulates illustrated by a diagram? 5) How do you solve an equation? 6) How do you determine the reasons for a geometric proof?	Conjecture Inductive Reasoning Counterexample Conditional Statement Converse Inverse Contrapositive If-Then Form Hypothesis Conclusion Negation Equivalent Statements Perpendicular Lines Bi-conditional Statement Deductive Reasoning Proof Two Column Proof Theorem
Concepts Students will know…	**Skills/Competencies** (I Can…) Based on LEQs Students will be able to…
1. How to use both inductive and deductive reasoning and determine the difference between them. 2. How to write a statement in if-then form and write the three related conditionals. 3. How to read a diagram and use postulates to interpret what they can assume from a diagram. 4. How to solve an equation. 5. How to supply reasons in a two-column proof when they are provided with statements.	1. I can determine the next value in a pattern. 2. I can determine if a series of statements uses the Law of Syllogism or the Law of Detachment. 3. I can write a conditional statement in if-then form and then write the converse, inverse and contrapositive of that statement. 4. I can solve an equation and supply the property used for each step. 5. I can read the statements in a two-column proof and use them and the diagram to determine the reason for each statement.

Assessment Evidence

Formative Assessment
Questioning, Think Pair Share, Graphic Organizers, Visual Representations, Bell Ringers, Exit Slips, Web Based Surveys

Summative Assessment
Common Assessments
Best Instructional Practices
Activating Strategies Extended Thinking Summarizing Vocabulary in Context Advance Organizers Non-verbal Representation Integration of Webb's Depth Integration of 21st Century Skills Reading and writing across disciplines Rigor and Relevance

Resources

Student	Teacher

Adapted from Wiggins, Grant and J. Mc Tighe. (1998). <u>Understanding by Design</u>, Association for Supervision and Curriculum Development, ISBN # 0-87120-313-8 (ppk)