Intensive Study in Number Theory (students must have completed Algebra 2 and geometry)
Grades 8th-10th

The goal of number theory is to present the basic techniques of mathematical proof and the logic behind them. This number theory course will help students think like mathematicians from the very beginning by offering a large variety of examples and problems for the students to work out in class and on their own. The class will contain an extensive list of basic mathematical definitions and concepts needed in abstract mathematics.

Topics included:

DAY 1: Introduction and Basic Terminology; General Suggestions; What does "If/Then" Mean? The Negation of a Statement: AND/OR

DAY 2: Proof by Contrapositive; Proof by Contradiction; "If and Only If" or "Equivalence Theorems"

DAY 3: Use of Counterexamples; Mathematical Induction; Existence/Uniqueness Theorems

DAY 4: Composite Statements: Multiple Hypotheses/Conclusions; Equality of Numbers

DAY 5: Mathematical topics on Which to Practice Proof Techniques