

Course Description

High School

Math II

Philosophy Statement: In Mathematics, God has blessed His creation with the ability to count, tell time, and make change. This is not an accident; it is a reflection of God's goodness. As students learn to appreciate God's gift of numbers and use of addition, subtraction, multiplication, and division, they should concurrently develop a heart of praise and thanksgiving in their study of mathematics. In mathematics the student will see the order and truth God created. Just as the Bible says "precept upon precept, line upon line . . ." (Isaiah 28: 10), students will build concept upon concept in mathematics.

Course Objective: The students will explore and experience a variety of different concepts of mathematics including functions, inequalities, systems of equations, quadratic and polynomials for the first part of the year. For the second part of the year they will explore geometric concepts including angles, transformations, congruence and proofs. They will use manipulatives with geometry and graphing. They will work weekly on problem solving adjacent to the unit themes.

Textbook: Reveal Math Algebra 2 and Reveal Math Geometry McGraw Hill

Time Allotment: 45 minutes one day per week, 90 minutes two days per week

Biblical Integration: *The Lord calls His people to obedience and guides them. Math provides ways to calculate details for building and construction. (1 Kings 6: 11-13) "Now the word of the Lord came to Solomon, Concerning this house that you are building, if you will walk in my statutes and obey my rules and keep all my commandments and walk in them, then I will establish my word with you, which I spoke to David your father. And I will dwell among the children of Israel and will not forsake my people Israel." (1 Kings 6:1-6) Solomon Builds the Temple "In the four hundred and eightieth year after the people of Israel came out of the land of Egypt, in the fourth year of Solomon's reign over Israel, in the month of Ziv, which is the second month, he began to build the house of the LORD. The house that King Solomon built for the LORD was sixty cubits long, twenty cubits wide, and thirty cubits high. The vestibule in front of the nave of the house was twenty cubits long, equal to the width of the house, and ten cubits deep in front of the house. And he made for the house windows with recessed frames. He also built a structure against the wall of the house, running around the walls of the house, both the nave and the inner sanctuary. And he made side chambers all around. The lowest story was five cubits broad, the middle one was six cubits broad, and the third was seven cubits broad. For around the outside of the house he made offsets on the wall in order that the supporting beams should not be inserted into the walls of the house."*

Course Content:

Weeks 1-7

Module 1: Relations and Functions

- I can determine the continuity of functions and whether functions are one-to-one and/or onto
- I can determine the linearity, intercepts and symmetry of functions
- I can identify extrema and end behavior of functions
- I can sketch graphs of functions and compare two functions represented in different ways
- I can graph linear functions and inequalities in two variables
- I can write and graph piecewise-defined, step, and absolute value functions
- I can identify and use transformations of functions

Weeks 8-13

Module 2: Linear Equations, Inequalities, and Systems

- I can solve linear equations and inequalities
- I can solve absolute value equations and inequalities
- I can write linear equations in standard, slope-intercept, and point-slope forms
- I can solve systems of equations by graphing
- I can solve systems of equations algebraically using substitution and elimination
- I can solve systems of inequalities in two variables
- I can solve systems of equations in three variables
- I can solve absolute value equations and inequalities by graphing

Weeks 14-18

Module 3: Quadratic Functions

- I can solve quadratic functions by graphing
- I can perform arithmetic operations using imaginary numbers
- I can use factoring to solve quadratic equations
- I can complete the square
- I can use the quadratic formula and the discriminant
- I can solve non-linear equations by graphing and algebraic expressions

Weeks 19-24

Module 4: Polynomials and Polynomial Functions

- I can use the key features of tables and graphs of polynomial functions to compare functions

- I can analyze graphs of polynomial functions
- I can add, subtract, and multiply polynomials
- I can divide polynomials
- I can expand powers of binomials

Weeks 25-28

Module 5: Polynomial Equations

- I can use arithmetic operations to simplify operations on and compositions of functions and determine their domain and range
- I can find the inverses of relations and functions and verify inverses by using the compositions of functions
- I can use the properties of exponents to rewrite and simplify expressions involving radicals and rational exponents
- I can graph radical functions
- I can use the structure of radical expressions to simplify and perform operations
- I can solve radical equations algebraically and by graphing

Weeks 28-30

Begin Geometry

Module 2: Angles and Geometric Figures

- I can use the definition of angle to describe geometric figures and solve problems
- I can find measures of angles using complementary and supplementary angles and identify what can and cannot be assumed about angles in a diagram
- I can find measures of two dimensional figures

Week 31-33

Module 4: Transformations and Symmetry

- I can use rigid motions to reflect figures on the coordinate plane
- I can use rigid motions to translate figures on the coordinate plane
- I can use rigid motions to rotate figures about points on the coordinate plane
- I can use two or more rigid motions to transform figures on the coordinate plane
- I can identify figures that tessellate the plane and create tessellations by using rigid motions
- I can use symmetry to describe the transformations that carry a figure onto itself

****Week 35: Iowa Testing****

Week 34-38

Module 5: Triangles and Congruence

- I can solve problems using the Triangle Angle-Sum and Exterior Angle Theorems

- I can prove that triangles are congruent and use congruence statements to solve problems
- I can solve problems using SSS and SAS Congruence Postulates
- I can solve problems using the ASA Congruence Postulate and the AAS Congruence Theorem
- I can solve problems using the LL, HA, LA and HL Theorems of Right Triangle Congruence
- I can solve problems involving isosceles and equilateral triangles using theorems of triangle congruence
- I can write coordinate proofs using theorems of triangle congruence

Week 39: Year End Testing

Resources:

- Delta Math website
- Teacher-made materials
- Student calculators (TI83 for 8th -10th Grades)
- Math manipulatives
- Pre-assessments

Areas of Evaluation:

- Class assignments
- Homework
- Quizzes, Module tests
- Teacher observations (whole group, independent, small group practice)
- Class projects