

Course Title: **Geometry**

Length of Study: **Full Year**

Number of Units: **1 Credit***

Grade Level Offered: **10th grade (& 9th grade accelerated)**

Textbook: **Geometry: Reasoning, Applying, and Measuring
McDougal Littell 2001**

Developed by: Matt Chartan
 Jon Mendreski
 Brigid Victorsen
 Christine Watt

August, 2009

Math 10 (and Math 9 Accelerated) Outline, Sequence, and Timeline

Introduction to Logic Unit (supplemental resources) (7 days)

Negation, Conjunction, and Disjunction (using Symbolic Logic)
Conditional and Related Conditionals (Converse, Inverse, Contra-positive)
Bi-conditionals
Truth Tables (mini truth tables for logic operators)
Truth/Solution Sets (Algebraic Applications of Logic)

Chapter 1 – Basics of Geometry (10 days)

Patterns and Inductive Reasoning (optional topic)
Points, Lines, and Planes
Segments, Measure, and Distance Formula
Angles and Measure
Segment Bisector/Midpoint Formula and Angle Bisector
Angle Pair Relationships (Vertical, Linear, Complementary, Supplementary)

Perimeter, Circumference, and Area – Layered Throughout Course

Introduction to Reasoning and Proof Unit (8 days)

Systems Discussion and Relation to Geometry
Undefined Terms, Definitions, Postulates/Axioms, and Theorems
Segment/Angle Addition Postulate (Sections 1.3 and 1.4)
Body of Basic Definitions
Properties of Congruence
Reflexive, Symmetric, Transitive, {and Substitution}
Using Properties of Congruence and Definitions to Draw Conclusions
Supplying “Reasons” for Drawn Conclusions
Mini Proofs

Chapter 3 – Perpendicular and Parallel Lines (10 days)

Perpendicular Lines: Postulate, Theorems, and Proofs
Parallel Lines: Definition and Postulate
Parallel Lines Cut by a Transversal: Postulate and Theorems
Proving Lines are Parallel: Postulate, Theorems, and Proofs*
Properties of Parallel Lines
Algebraic Applications of Perpendicular and Parallel Lines
Parallel/Perpendicular Lines and Slopes in the Coordinate Plane
(review topic from Math 9)
Writing Equations of Lines (review topic from Math 9)
*Proving Theorems – Converting Hypothesis/Conclusion → Given/Prove

CONTINUE →

Chapter 4 – Congruent Triangles (13 days)

Classifying Triangles by Sides and Angles (review topic from 8th grade)
Angle Sum Theorems and Corollary
Congruence and Triangles: Definitions, Theorems, and Proofs
Triangle Congruence Postulates, Theorems and Proofs: SSS, SAS, ASA, AAS
Using Triangle Congruence: CPCTC and Double Proofs
Special Triangles, Theorems and Proofs: Isosceles, Equilateral, and Right

{NOTE: Coordinate Geometry Triangle Proofs can be covered here or after Chapter 6}

Chapter 5 – Properties of Triangles (10 days)

Perpendicular Bisector, Angle Bisector, and Theorems
Associated Segments of a Triangles (Median, Altitude, and Angle Bisector)
Concurrency of Medians, Altitudes, & Angle Bisectors (Centroid, Orthocenter, etc.)
Mid-segment Theorem: Proofs and Properties
Inequalities in a Triangle: Properties
Indirect Proof

Chapter 6 – Quadrilaterals (12 days)

Parts of Polygons (Vertices, Sides, and Diagonals; consecutive, opposite)
Properties of Quadrilaterals: Interior Angle Sum Theorem
Properties and Theorems of a Parallelogram
Properties and Theorems of Special Quadrilaterals
Theorems and Euclidian/Coordinate Geometry Proofs Involving Parallelograms
Theorems/Corollaries and Euclidian/Coordinate Geometry Proofs Involving Rhombuses, Rectangles, and Squares
Theorems and Euclidian/Coordinate Geometry Proofs Involving Trapezoids

{NOTE: Coordinate Geometry Proofs can be covered at the end of Chapter 6}

Chapter 7 – Transformations (6 days)

Rigid Motions and Isometries and Invariants
Translations and the Coordinate Plane
Reflections in a Line and the Coordinate Plane
Rotations and the Coordinate Plane (Reflection Through a Point)
Types of Symmetries: Line Symmetry and Rotational Symmetry
Compositions of Transformations

Chapter 8 – Similarity (8 days)

Ratios and Proportions and Applications to Geometry
Geometric Mean
Similar Polygons: Definition and Relationships
Similar Triangles: Postulates, Theorems, and Properties and Proofs
Similar Triangles and Proportional Theorems

{NOTE: Perimeter/Area of Similar Triangles/Polygons can be covered here }

Chapter 9 – Right Triangles and Trigonometry (8 days)

Altitude Drawn to the Hypotenuse of a Right Triangle
Pythagorean Theorem (review topic from 8th and 9th grade) and Converse – Proofs
Special Right Triangles: Isosceles and 30°-60°-90°

Chapter 10 – Circles (14 days)

Parts of a Circle
Tangents to a Circle: Properties and Theorems
Central Angles, Intercepted Arcs, and Chords: Properties and Theorems
Arcs Intercepted by Parallel Chords
Inscribed Angles and Their Intercepted Arcs: Properties and Theorems
Angles and Their Intercepted Arcs Formed by:
 A Tangent and a Chord
 Two Chords
 A Tangent and a Secant
 Two Tangents
 Two Secants
Segment Length Relationships in a Circle:
 Two Chords
 Two Secants
 A Secant and a Tangent
Problem Solving and Applications

Circles, Construction, and Locus Unit (supplemental resources) (10 days)

Equations of Circles in the Coordinate Plane
Solving a Linear/Quadratic Systems (Line/Parabola and Line/Circle)

Constructions:

Copy a Segment, Copy an Angle
Bisect a Segment, Bisect an Angle
Perpendicular to a Line from a Point on the line; *not* on the Line
Parallel to a Given Line
Application Constructions (equilateral triangles and other)
Concurrence of: Medians, Altitudes, Angle Bisectors of a Triangle
Five Basic Locus Theorems (supplemental resources)
Compound Locus (supplemental resources)

Chapter 11 – Measurements in Polygons and Circles (8 days)

Internal/External Angles of a Polygon; Angle Sum Theorem
Regular Polygons (Section 11.2)
Circumference, Arc Length, and Problem Solving
Areas of Circles, Sectors, and Regions

Solid Geometry Unit (Chapter 12) – (10 days)

3-Dimensions and Types of Solids
Parts of Solids: Face, Edge, and Vertex
Surface Area: Prisms and Cylinders (*Pyramids and Cones if time permits*)
Volume: Prisms/ Cylinders and Pyramids/Cones
Surface Area and Volume of Spheres
Cross Sections of Solids
(*Similar Solids if time permits*)

End-of-Year Schedule

Review for Geometry Regents Exam (15 days)

Geometry Regents Exam (3 hours) – One day during Regents week in June

*Note: The units highlighted in **boldface type** represent areas in which the class will use supplemental materials outside of the textbook in order to study those topics.

*Note: This outline also serves as the basis for the Geometry Course for 9th grade accelerated students. The 9th grade accelerated teacher will augment this syllabus with additional topical inclusions as well as a more in-depth study of some of the same topics presented in the regular 10th grade classes.

In an attempt to strengthen the CSH Math Department's commitment to addressing NYS's Standards in Geometry, the Math 10 and Math 9 Accelerated teachers will, where practicable, make an effort to:

- 1) incorporate meaningful activities into the curriculum that will encourage student exploration of Geometric topics; and*
- 2) provide opportunities for students to solve problems that cut across several strands of the Standards.*