

<b>Course Title:</b>	<b>Geometry</b>
<b>Length of Study:</b>	<b>Full Year</b>
<b>Number of Units:</b>	<b>1 Credit*</b>
<b>Grade Level Offered:</b>	<b>10<sup>th</sup> grade (&amp; 9<sup>th</sup> grade accelerated)</b>
<b>Textbook:</b>	<b>Geometry: Reasoning, Applying, and Measuring McDougal Littell 2001</b>

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# **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 8<sup>th</sup> 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 8<sup>th</sup> and 9<sup>th</sup> 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*)

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## End-of-Year Schedule

Review for Geometry Regents Exam (15 days)

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

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\*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 9<sup>th</sup> grade accelerated students. The 9<sup>th</sup> 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 10<sup>th</sup> grade classes.

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*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.*