

Lake Zurich High School Mathematics Department

Geometry - Academic

Course Description

Prerequisites: Algebra I
Open To: 10, 11, 12
Credit: 1 unit
Level: Academic

This course integrates the basic principles of geometry and algebra. Both the pace and the level of complexity have been adapted and modified for students who have experienced difficulty with mathematical concepts. This course includes all major topics from the Geometry curriculum with less emphasis on proof. This course is designed to prepare the student for Intermediate Algebra.

Textbook

Title:	Geometry – Concepts and Skills
Publisher:	McDougal Littell
Author(s)	Larson, Boswell, Stiff
Copyright date:	2005
ISBN number:	(0-618-50157-6) (978-0-618-50157-1)

Course Objectives

At the end of the course, the student will be able to:

1. Make predictions and conjectures based on patterns and examine the foundations of geometry.
2. Analyze bisectors and classify angles.
3. Use properties of parallel and perpendicular lines.
4. Classify triangles and examine the relationships between a triangle's angles and sides.
5. Apply properties of congruent triangles, show triangles are congruent, and use bisectors and symmetry to create congruent triangles.
6. Classify polygons and use properties of special quadrilaterals.
7. Apply ratios and proportions to similar figures.
8. Determine angles and areas of polygons and find circumference and area of circles.
9. Identify and find surface area and volume of solids.
10. Find sides of special right triangles and solve right triangles using trigonometry.
11. Apply properties of circle and their parts, write equations of circle and identify rotations in a plane.

Course Syllabus

1st Semester

Chapter	Topic
1	Basics of Geometry
2	Segments and Angles
3	Parallel and Perpendicular Lines
4	Triangle Relationships
5	Congruent Triangles
6	Quadrilaterals

2nd Semester

Chapter	Topic
7	Similarity
8	Polygons and Areas
9	Surface Area and Volumes
10	Right Triangles and Trigonometry
11	Circles

Chapter and Unit Objectives

Chapter # 1 Basics of Geometry

Major objective: Make predictions and conjectures based on patterns and examine the foundations of geometry.

Detailed Unit Objectives:

1. Find patterns to make predictions
2. Use inductive reasoning to make conjectures
3. Use postulates and undefined terms
4. Sketch simple figures and their intersections
5. Measure segments and add segment lengths
6. Measure and classify angles and add angle measures

Chapter # 2 Segments and Angles

Major objective: Analyze bisectors and classify angles.

Detailed Unit Objectives:

1. Bisect a segment and find the coordinates of the midpoint of a segment
2. Apply the properties of an angle bisector
3. Define and determine the measures of complementary and supplementary angles
4. Apply the Vertical Angle Theorem and Linear Pair Postulate to find measures of angles
5. Use conditional statements and apply laws of logic
6. Apply properties of equality and congruence

Chapter # 3 Parallel and Perpendicular Lines

Major objective: Use properties of parallel and perpendicular lines.

Detailed Unit Objectives:

1. Identify relationships between lines
2. Apply properties of right angles and perpendicular lines
3. Identify angle pairs formed by two lines and a transversal
4. Determine measures of angles formed by parallel lines and a transversal
5. Determine if two lines are parallel based on angle relationships

Chapter # 4 Triangle Relationships

Major objective: Classify triangles and examine the relationships between a triangle's angles and sides.

Detailed Unit Objectives:

1. Classify triangles by their sides and angles
2. Determine missing angle measures in triangles
3. Apply properties of isosceles and equilateral triangles
4. Apply the Pythagorean Theorem and Distance Formula
5. Use the converse of the Pythagorean Theorem to classify triangles
6. Use triangle measurements to compare sizes of sides and angles

Chapter # 5 Congruent Triangles

Major objective: Apply properties of congruent triangles, show triangles are congruent, and use bisectors and symmetry to create congruent triangles.

Detailed Unit Objectives:

1. Identify congruent triangles and corresponding parts
2. Proving congruent triangles through SAS and SSS
3. Proving congruent triangles through ASA and AAS
4. Proving congruent triangles through HL and summarize all congruent postulates
5. Showing corresponding parts of congruent triangles are congruent
6. Apply properties of angle bisectors and perpendicular bisectors
7. Identify and use reflections and lines of symmetry

Chapter # 6 Quadrilaterals

Major objective: Classify polygons and use properties of special quadrilaterals.

Detailed Unit Objectives:

1. Identify and classify polygons and determine angle measures of quadrilaterals
2. Use properties of parallelograms
3. Proving that a quadrilateral is a parallelogram
4. Use properties of rectangles, rhombi, and squares
5. Use properties of trapezoids and isosceles trapezoids
6. Identify special quadrilaterals from properties given

Chapter # 7 Similarity

Major objective: Apply ratios and proportions to similar figures.

Detailed Unit Objectives:

1. Use ratios and proportions
2. Identify similar polygons
3. Show that triangles are similar using AA~
4. Show that triangles are similar using SAS~ and SSS~
5. Use the Triangle Proportionality Theorem and its converse
6. Identify and draw dilations

Chapter # 8 Polygons and Areas

Major objective: Determine angles and areas of polygons and find circumference and area of circles.

Detailed Unit Objectives:

1. Describe polygons
2. Find the measures of interior and exterior angles of polygons
3. Find the area of squares and rectangles
4. Find the area of triangles
5. Find the area of parallelograms
6. Find the area of trapezoids
7. Find the circumference and area of circles.

Chapter # 9 Surface Area and Volumes

Major objective: Identify and find surface area and volume of solids

Detailed Unit Objectives:

1. Identify and name solid figures
2. Find the surface area of prisms and cylinders
3. Find the surface area of pyramids and cones
4. Find the volumes of prisms and cylinders
5. Find the volumes of pyramids and cones
6. Find the surface area and volume of spheres

Chapter # 10 Right Triangles and Trigonometry

Major objective: Find sides of special right triangles and solve right triangles using trigonometry.

Detailed Unit Objectives:

1. Simplify square roots
2. Find the side lengths of 45-45-90 triangles
3. Find the side lengths of 30-60-90 triangles
4. Find the tangent of an acute angle
5. Find the sine and cosine of an acute angle
6. Solve for all missing parts of a right triangle

Chapter # 11 Circles

Major objective: Apply properties of circle and their parts, write equations of circle and identify rotations in a plane.

Detailed Unit Objectives:

1. Identify segments and lines related to circles
2. Use properties of a tangent to a circle
3. Apply properties of arcs and circles
4. Apply properties of chords of circles
5. Use properties of inscribed angles
6. Write and graph the equation of a circle
7. Identify rotations and rotational symmetry