

Wisconsin Lutheran High School
2006-2007

Course Title Geometry

Instructor Mr. Kurt Seeger

Textbook *Geometry* – Larson, Boswell, Stiff: McDougall Littell, 2001

Student Supplies

- 3-ring binder
- Graphing Notebook
- Calculator
- Pencils
- 12 dividers

Course Purpose

The purpose of this course is to develop geometric design and number concepts, using the principles of logic, inductively and deductively, to arrive at conclusions which are based upon definitions, assumptions, and theorems.

Course Outcomes

1. The student will identify, describe, and analyze properties of figures.
2. The student will use geometric models to solve mathematical and virtual life problems.
3. The student will communicate reasoning by demonstration, informal proof, and counter examples.
4. The student will show an understanding of the three ratios used in right triangle trigonometry.
5. The student will find measurements indirectly using techniques of geometry and right angle triangle trigonometry.
6. The student will find measurements indirectly using various geometric formulas.
7. The student will find measurements indirectly using various geometric relationships and properties of circles and polygons.
8. The student will become familiar with the applications of Cabri Junior.

Course Goals

1. Prepare each student to use his/her time, talents, and treasures to glorify God in a life of faithful service.
2. Each student will recognize the order in God's perfect creation.
3. By God's saving grace each student will recognize the importance of questioning and testing different theories and ideas before accepting them as fact.
4. Guide each student to use his/her testing and questioning abilities when faced with religious differences or situations.

A variety of instructional techniques will be used. They will include, but are not limited to, lecture/presentation, small group work, individual work, class discussion, overhead projector, and power point presentations.

Course Outline

Quarter 1—Chapters 1-3

Quarter 2—Chapters 4-6

Quarter 3—Chapters 8-9

Quarter 4—Chapters 10-11, parts of 12 and 7

Chapter One: Basics of Geometry

The students will . . .

- Find and describe patterns
- Use inductive reasoning to form conjectures
- Understand and use the basic undefined and defined terms of geometry: point, line, plane, segment, ray
- Sketch the intersections of lines and planes
- Use the distance, mid-point, perimeter, and area formulas
- Classify angles as acute, right, obtuse, or straight
- Measure segments and angles
- Bisect segments and angles
- Identify vertical angles, linear pairs, and complementary and supplementary angles
- Find the perimeter and area of common plane figures

Textbook: pages 3-63

Number of days: 10-13

S.O.—3, 4, 6

D.O.—1.2, 3.1, 4.1

W.S.S.—A12.1, A12.2, C12.1, D12.3

Chapter Two: Reasoning and Proof

The students will . . .

- Recognize and analyze conditional statements, converse, inverse, and contrapositive statements
- Apply basic postulates of geometry to real-life situations
- Use, analyze, and write biconditional statements
- Use symbolic notation to represent logical statements
- Use deduction and algebra properties to demonstrate the solution of equations in a two-column format
- Differentiate and use the Law of Detachment and Law of Syllogism
- Prove statements about segments and angles using segment and angle congruence properties
- Use properties of length and measure to justify segment and angle relationships
- Justify statements about congruent segments

Textbook: pages 70-121

Number of days: 13-16

S.O.—2, 3, 4, 6

D.O.—1.2, 2.3, 4.1, 4.2, 4.3

W.S.S.—A12.1, A12.2, A12.4, A12.5, B12.2, B12.3, B12.4, C12.1, C12.3

Chapter Three: Perpendicular and Parallel Lines

The students will . . .

- Identify angles formed by transversals
- Prove and use results of parallel or perpendicular lines and transversals
- Find slopes of lines and use slopes to identify parallel and perpendicular lines in a coordinate plane
- Write equations of parallel and perpendicular lines in a coordinate plane
- Use Cabri Junior to draw parallel and perpendicular lines and verify theorems

Textbook: pages 128-183

Number of days: 16-19

S.O.—2, 3, 4, 6

D.O.—2.1, 2.2, 2.3, 3.3, 4.1, 4.2, 4.4

W.S.S.—A12.1, A12.2, A12.4, A12.5, B12.3, C12.1, C12.2, C12.3, C12.4, D12.3, F12.3, F12.4

Chapter Four: Congruent Triangles

The students will . . .

- Classify triangles by their sides and angles
- Find measures of interior and exterior angles in triangles
- Identify congruent figures and corresponding parts
- Prove triangles are congruent by using SSS, SAS, AAS, and ASA congruence postulates and theorems
- Use congruent triangles to plan and write proofs

- Investigate isosceles, equilateral, and right triangles
- Place geometric figures in a coordinate plane

Textbook: pages 192-259

Number of days: 14-16

S.O.—2, 3, 4, 6

D.O.—1.2, 2.1, 2.3, 4.2, 4.3

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.2, B12.3, C12.1, C12.3, D12.3, F12.3

Chapter Five: Properties of Triangles

The students will . . .

- Use special lines and segments related to triangles: perpendicular bisectors, angle bisectors, medians, and altitudes
- Use properties of angle bisectors to identify equal distances
- Recognize points of concurrency
- Identify and use midsegments of a triangle
- Use triangle measurements to decide which side is longest or which angle is largest
- Use triangle inequality and indirect proofs
- Use the Hinge Theorem and its converse to compare side lengths and angle measures
- Use Cabri Junior for construction of special lines

Textbook: pages 261-317

Number of days: 13-15

S.O.—2, 3, 4, 6

D.O.—2.1, 2.2, 2.3, 3.3, 4.1, 4.3, 4.4

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.2, B12.3, C12.1, C12.3, C12.4, D12.3, F12.3

Chapter Six: Quadrilaterals

The students will . . .

- Identify, name, and describe polygons
- Use the sum of the measures of the interior angles of a quadrilateral
- Examine and use properties of sides, angles, and diagonals of parallelograms
- Prove facts about parallelograms, rectangles, squares, rhombi, trapezoids, and kites
- Use coordinate geometry with parallelograms
- Identify special quadrilaterals based on limited information
- Calculate area of triangles and quadrilaterals

Textbook: pages 320-390

Number of days: 13-15

S.O.—2, 3, 4, 6

D.O.—1.2, 2.1, 2.2, 2.3, 3.1, 4.1

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.3, C12.1, C12.3, C12.4, D12.3, F12.3

Chapter Seven: Transformations

The students will . . .

- Describe motion of geometric figures in a plane in three different ways using forms of symmetry: reflections, translations, and rotations
- Find the image of a glide reflection
- Use a composition of transformations
- Classify Frieze patterns

Textbook: pages 394-453

Number of days: 10-12

S.O.—2, 3, 4, 6

D.O.—1.2, 2.2, 3.1, 4.2, 5.1

W.S.S.—A12.1, A12.2, A12.4, A12.5, C12.1, C12.3, C12.4, D12.3

Chapter Eight: Similarity

The students will . . .

- Find and simplify the ratio of two numbers
- Use properties of proportions to solve real-life problems
- Identify similar polygons and similar triangles
- Prove triangles are similar using four different strategies: ratio, proportion, similar polygons, and similar triangles
- Use proportionality theorems to calculate segment lengths
- Identify and use dilations in real life

Textbook: pages 456-523

Number of days: 13-15

S.O.—2, 3, 4, 6

D.O.—2.1, 2.2, 2.3, 3.1, 4.1

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.2, B12.3, B12.4, C12.1, C12.2, C12.3, C12.4, D12.3, F12.3

Chapter Nine: Right Triangles and Trigonometry

The students will . . .

- Learn and use properties of right triangles, similar right triangles, and special right triangles
- Prove and use the Pythagorean Theorem
- Learn applications of right triangles including trigonometric ratios and vectors

Textbook: pages 526-590

Number of days: 13-16

S.O.—2, 3, 4, 5, 6

D.O.—2.1, 2.2, 2.3, 3.1, 3.3, 4.1, 4.2, 4.4

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.2, B12.3, B12.4, C12.1, C12.2, C12.3, C12.4, C12.5, D12.2, D12.3, F12.3

Chapter Ten: Circles

The students will . . .

- Identify the various parts of a circle
- Find the measures of angles and arcs
- Recognize inscribed and circumscribed angles
- Calculate lengths of chords, secants, and tangents
- Use different equations of circles
- Draw and find a locus

Textbook: pages 594-653

S.O.—2, 3, 4, 6

D.O.—2.1, 2.2, 2.3, 3.1, 4.1, 4.3

W.S.S.—A12.1, A12.2, A12.4, A12.5, B12.2, B12.3, C12.1, C12.2, C12.3, C12.4, C12.5, D12.3, F12.3

Chapter Eleven: Area of Polygons and Circles

The students will . . .

- Find angle measures and areas of regular polygons
- Compare perimeters and areas of similar figures
- Find the circumference and area of a circle, arc length, and area of a sector
- Find a geometric probability

Textbook: pages 660-714

Number of days: 11-14

S.O.—2, 3, 4, 5, 6

D.O.—2.1, 2.3, 4.3

W.S.S.—A12.1, A12.2, A12.3, A12.4, A12.5, B12.2, B12.3, C12.1, C12.3, D12.1, D12.3, F12.3

Chapter Twelve: Surface Area and Volume

The students will . . .

- Find the surface areas and volumes of prisms, cones, pyramids, and cylinders
- Compare similar solids
- Calculate various ratios of volumes and areas

Textbook: pages 718-775

Number of days: 12-15

S.O.—2, 3, 4, 5, 6

D.O.—2.1, 2.2, 2.3, 3.1

W.S.S.—A12.1, A12.2, A12.4, A12.5, B12.2, B12.3, C12.1, C12.3, C12.4, D12.3, F12.3

Appendix

Name of Course: Geometry

Name of Teacher: Mr. Kurt Seeger

Department Outcomes:

Chapter 1

1.2—Recognizes god’s logical order and expression in creation as evidenced in the structure of mathematics

3.1—Integrates the use of mathematics into other academic and real-life areas

4.1—Orally justifies a solution to a problem

Chapter 2

1.2—Recognizes god’s logical order and expression in creation as evidenced in the structure of mathematics

2.3—Is a logical thinker and uses the principles of logic

4.1—Orally justifies a solution to a problem

4.2—Documents a logical sequence of symbolic manipulation

4.3—Effectively expresses mathematical ideas in written form

Chapter 3

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.3—Is capable of effectively using technology as a tool for problem solving

4.1—Orally justifies a solution to a problem

4.2—Documents a logical sequence of symbolic manipulation

4.4—Demonstrates the use of various technologies in expressing mathematical ideas and competencies

Chapter 4

1.2—Recognizes god’s logical order and expression in creation as evidenced in the structure of mathematics

2.1—Develops a repertoire of problem solving techniques

2.3—Is a logical thinker and uses the principles of logic

4.2—Documents a logical sequence of symbolic manipulation

4.3—Effectively expresses mathematical ideas in written form

Chapter 5

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.3—Is capable of effectively using technology as a tool for problem solving

4.1—Orally justifies a solution to a problem

4.3—Effectively expresses mathematical ideas in written form

4.4—Demonstrates the use of various technologies in expressing mathematical ideas and competencies

Chapter 6

1.2—Recognizes god’s logical order and expression in creation as evidenced in the structure of mathematics

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.1—Integrates the use of mathematics into other academic and real-life areas

4.1—Orally justifies a solution to a problem

Chapter 7

1.2—Recognizes god’s logical order and expression in creation as evidenced in the structure of mathematics

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

3.1—Integrates the use of mathematics into other academic and real-life areas

4.2—Documents a logical sequence of symbolic manipulation

5.1—Uses available resources to acquire knowledge to achieve a goal

Chapter 8

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.1—Integrates the use of mathematics into other academic and real-life areas

4.1—Orally justifies a solution to a problem

Chapter 9

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.1—Integrates the use of mathematics into other academic and real-life areas

3.3—Is capable of effectively using technology as a tool for problem solving

4.1—Orally justifies a solution to a problem

4.2—Documents a logical sequence of symbolic manipulation

4.4—Demonstrates the use of various technologies in expressing mathematical ideas and competencies

Chapter 10

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.1—Integrates the use of mathematics into other academic and real-life areas

4.1—Orally justifies a solution to a problem

4.3—Effectively expresses mathematical ideas in written form

Chapter 11

2.1—Develops a repertoire of problem solving techniques

2.3—Is a logical thinker and uses the principles of logic

4.3—Effectively expresses mathematical ideas in written form

Chapter 12

2.1—Develops a repertoire of problem solving techniques

2.2—Produces beneficial and God-pleasing solutions to the diversity of real-life problems

2.3—Is a logical thinker and uses the principles of logic

3.1—Integrates the use of mathematics into other academic and real-life areas