



LEE ACADEMY

Lee, Maine USA

Official Curriculum

Geometry

Written 07/06, rev. 07/08

Course description:

In *Geometry*, students develop reasoning and problem-solving skills through their study of congruence and similarity. They apply properties of lines, triangles, quadrilaterals, and circles. Students also use an applied knowledge of length, perimeter, area, circumference, surface area, and volume to solve real-world problems. Types of assessment vary, but include multiple choice, short response, extended response, and major situation-based applications. The course makes extensive use of graphing calculators.

Primary text(s) and other major resources
Geometry Larson, Boswell, Kanold, Stiff
 (MacDougall Littell, 2007)

○ unit number, title & approximate length, and MLRs	Objectives	Essential Concepts	Assessment
U1 Working With Points, Lines, and Planes—6	Objective set 1:		

weeks

Goal set 1:

- Describe geometric figures. **C**
- Measure geometric figures. **C**
- Understand equality and congruence. **C8**

Goal set 2:

- Use inductive and deductive reasoning.
- Understand proofs of geometric relationships in diagrams.
- Learn essential geometric postulates and theorems

Goal set 3:

- Use properties of

3 classes--

Student will:

- identify points, lines, and planes
- use segment postulates to identify congruent segments
- find lengths of segments in the coordinate plane, using midpoint and distance formulas
- use angle postulates to name, measure and classify angles
- use special angle relationships to find angle measures
- classify polygons
- find perimeter, circumference and area of polygons

Objective set 2:

4 classes--

Student will:

- describe patterns and use inductive reasoning.
- write definitions as conditional statements
- use postulates involving points, lines, and planes
- use properties from algebra to reason
- understand statements about segments and angles in proofs
- understand properties of special pairs of angles

Objective set 3:

5 classes

- prove lines are parallel/identify angle pairs formed by three intersecting lines.
- use angles formed by parallel lines

- understanding of geometric figures and their basic relationships

- learn generally accepted statements that explain relationships in geometry, then use these statements to logically make relationships.

<p>parallel and perpendicular lines.</p> <ul style="list-style-type: none"> • Prove relationships using angle measures. • Make connections to lines in algebra. 	<p>and transversals.</p> <ul style="list-style-type: none"> • find and use slopes • write and graph equations of lines • find a distance between a point and a line 	<ul style="list-style-type: none"> • relating algebra to geometry, to understand how they are connected and how each reinforces the other 	
<p>U2 Triangles—8 weeks Goal set 4:</p> <ul style="list-style-type: none"> • Classify triangles by sides and angles. C8 • Prove that triangles are congruent . • Use coordinate geometry to investigate triangle relationships. C8 <p>Goal set 5:</p> <ul style="list-style-type: none"> • Use properties of special segments in triangles. C8 • Use triangle inequalities to determine what triangles are possible. C8 • Extend methods for justifying and 	<p>Objective set 4: 7 classes Student will:</p> <ul style="list-style-type: none"> • classify triangles and find measures of their angles • apply congruence and triangles • use side lengths to prove triangles congruent • use sides and angles to prove congruence • use congruent triangles to prove corresponding parts congruent • use theorems about isosceles and equilateral triangles • create an image congruent to a given triangle (transformations) <p>Objective set 5: 3 classes Student will:</p> <ul style="list-style-type: none"> • use properties of mid-segments • use perpendicular bisectors to solve problems • use angle bisectors to find distance relationships • use medians and altitudes of triangles • find possible side lengths of a triangle 	<ul style="list-style-type: none"> • understand the basic geometric relations of angles and sides, and applying them to construction and architecture. • understanding the special geometric links to measurement of distance, often used in astronomy and surveying. 	<ul style="list-style-type: none"> • At end of unit, use Ch4 Test, p286

<p>proving relationships.</p> <p>Goal set 6:</p> <ul style="list-style-type: none"> • Use ratios and proportions to solve geometry problems • Show that triangles are similar. C8 • Use indirect measurement and similarity. 	<p>Objective set 6: 6 classes Student will:</p> <ul style="list-style-type: none"> • write and solve proportions • use proportions to solve geometry problems • use proportions to identify similar polygons • use proportionality theorems • perform dilations (transformations) 	<ul style="list-style-type: none"> • apply rules of proportion and scale to understand their use in real-world situations. 	
<p>U3 Figures in the Plane—11 weeks Goal set 7:</p> <ul style="list-style-type: none"> • Use the Pythagorean theorem and its converse. C8 • Use special relationships in right triangles. C8 • Use trigonometric ratios to solve right triangles. C8 	<p>Objective set 7: 11 classes Student will:</p> <ul style="list-style-type: none"> • apply Pythagorean theorem to find side lengths in right triangles • use converse of Pythagorean theorem to determine if a triangle is a right triangle • use properties of the altitude of a right triangle • use relationships among the sides in special right triangles • use the tangent ration for indirect measurement • use the tangent, sine and cosine ratios • use the inverse of tangent, sine and cosine ratios to solve triangles 	<ul style="list-style-type: none"> • use trigonometric ratios to find unknown side lengths and angle measures in right triangles (e.g. find the length of a ski slope) 	<ul style="list-style-type: none"> • Important: As part of the conclusion of this unit, use “Designing a Tent” Assessment (MAP)

<p>Goal set 8</p> <ul style="list-style-type: none"> • Use angle relationships in polygons. C • Use properties of parallelograms. C • Classify quadrilaterals by their properties. C <p>Goal set 9:</p> <ul style="list-style-type: none"> • Perform congruence and similarity transformations. C • Make real-world connections to symmetry and tessellations. C • Apply matrices and vectors in geometry. C 	<p>Objective set 8: 7 classes Student will:</p> <ul style="list-style-type: none"> • find angle measures in polygons • find angle and side measures in parallelograms • use properties of rhombuses, rectangles and squares • use properties of trapezoids and kites • identify special quadrilaterals <p>Objective set 9: 5 classes Student will:</p> <ul style="list-style-type: none"> • reflect a figure in any given line • rotate figures about a point • perform combinations of two or more transformations • identify line and rotational symmetries of a figure 	<ul style="list-style-type: none"> • use proportions of quadrilaterals and other polygons to find side length and angle measures. • show how to move two dimensional shapes on a plane, a skill that is useful in working with blueprints and graphic design. 	
<p>U4 Circles and Measurement—13 weeks Goal set 10:</p> <ul style="list-style-type: none"> • Use properties of segments that intersect circles. C9 • Apply angle relationships in circles. C9a • Use circles in the coordinate plane. C 	<p>Objective set 10: 11 classes Student will:</p> <ul style="list-style-type: none"> • use properties of a tangent to a circle • use angle measures to find arc measures • use relationships of arcs and chords in a circle • use inscribed angles and polygons • find the measures of angles inside or outside a circle • find segment lengths in circles • write and graph equations of circles in the coordinate plane 	<ul style="list-style-type: none"> • use properties of circles to investigate and model natural phenomena (e.g. the aurora borealis) 	

<p>Goal set 11:</p> <ul style="list-style-type: none"> • Use area formulas for polygons. C • Relate length, perimeter, and area ratios in similar polygons. C10 • Compare measures for parts of circles and the whole circle. C9b <p>Goal set 12:</p> <ul style="list-style-type: none"> • Explore solids and their properties C10. • Solve problems using surface area and volume. C10 • Connect similarity to solids. 	<p>Objective set 11: 11 classes Student will:</p> <ul style="list-style-type: none"> • find areas of triangles and parallelograms • find areas of trapezoids, rhombuses and kites • use ratios to find areas of similar figures • find arc lengths, circumference and other measures • find the areas of circles and sectors • find areas of regular polygons inscribed in circles • use lengths and areas to find geometric probabilities <p>Objective set 12: 11 classes Student will:</p> <ul style="list-style-type: none"> • explore and identify solids • find surface areas and volumes of prisms and cylinders • find surface areas and volumes of pyramids and cones • find surface area and volumes of spheres • use properties of similar solids 	<ul style="list-style-type: none"> • apply formulas for perimeter, circumference, and area to find and compare measures (e.g. the lanes of an oval running track) • application of surface area and volume formulas to analyze real-world spaces (e.g. volume of a column on a building, volume of liquid calcium in a tractor tire) 	<ul style="list-style-type: none"> • Important assessment, applying the skills and knowledge of this unit-- "The Deep End" (MAP)
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