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### Course Description

**Subject:** Geometry      **Grade:** 8

**Overview: Geometry** is a core academic course that meets everyday day for the second semester. The focus is on problem solving, proving theorems and applying algebraic techniques to geometric problems. Instruction includes daily warm-up activities, class notes and examples, daily homework, quizzes and tests. Emphasis is placed on recognizing the relatedness of all things in God's world.

**Primary Biblical Integration:** The order of the world created by God can be seen in mathematics. We also come to understand the absoluteness of God through the consistency of mathematics. Geometry teaches students to think logically and to see the inter-relatedness of all of God's creation. We also learn that some things are not relative but can be proven.

#### Unit Description:

Chapter 1 Points, Lines, Planes and Angles  
Chapter 2 Reasoning and Proof  
Chapter 3 Parallel and Perpendicular Lines  
Chapter 4 Congruent Triangles  
Chapter 5 Relationships in Triangles  
Chapter 6 Proportions and Similarity

#### Student Materials:

Geometry; Glencoe, California edition; ISBN: 0-07-8660013-0

#### Teacher Materials:

Geometry, Teacher's Edition; Glencoe, California edition; ISBN: 0-07-866014-9

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# COURSE OUTLINE

Teacher's Name: Lehman		Subject: Honors Geometry		# of Quarters: 2	
Text (if any): Glencoe Geometry I			Other Materials: Glencoe Algebra I		
Recurring Themes, Principles, Skills or Concepts:	1) Geometry Proofs	2) Applying algebraic principles to geometric figures			
Unit Title & Expected Start Date	Theme	Biblical Application	Key Concepts		
Ch 1 Points, lines, planes and angles	same	In the beginning...	Linear and angle measure, polygons, distance and midpoints		
Ch 2 Reasoning and proofs	same	God is a God of logic	Inductive reasoning, postulate and paragraph proofs, algebraic proofs		
Ch 3 Parallel and perpendicular lines	same	Anti-relativism; some things can never be reconciled	Equations of the line, slope, perpendicular lines and distance		
Ch 4 Congruent triangles	same	We are unique yet alike	Classifying triangles, proving congruence		
Ch 5 Relationships in triangles	same	Community	Bisectors, medians and altitudes, indirect proof		
10)					

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# UNIT PLANNER

Teacher's Name: Lehman		Subject: Geometry		Period(s): 5	
Unit #: 1	Dates - Starting: Ending:		Total Instructional Days:		
Unit Title: Chapter 1 Points, Lines, Planes and Angles					
Theme: same					
Biblical Application: In the beginning...					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1) Linear and angle measurement		Notes and homework	Worksheets, homework, quizzes	3a	
2) Polygons	10	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
3) Distance formula	15	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
4) Midpoint formula		Notes and homework	Worksheets, homework, quizzes	2b, 3a	
5)					
Key Activities and Methods: Discussion, graded homework, mimio examples					

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# UNIT PLANNER

Teacher's Name: Lehman		Subject: Geometry		Period(s): 5	
Unit #: 2	Dates - Starting: Ending:		Total Instructional Days:		
Unit Title: Chapter 2 Reasoning and Proofs					
Theme: same					
Biblical Application: God is a God of logic					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1) Inductive reasoning	2	Notes and homework	Worksheets, homework, quizzes	3a	
2) Postulates	1	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
3) Paragraph proofs	2,3	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
4) Algebraic proofs	3	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
5)					
Key Activities and Methods: Discussion, graded homework, mimio examples					

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# UNIT PLANNER

Teacher's Name: Lehman		Subject: Geometry		Period(s): 5	
Unit #: 3	Dates - Starting:		Ending:	Total Instructional Days:	
Unit Title: Chapter 3 Parallel and Perpendicular Lines					
Theme: same					
Biblical Application: Anti-relativism; some things can never be reconciled					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1) Equations of the line		Notes and homework	Worksheets, homework, quizzes	3a	
2) Slope		Notes and homework	Worksheets, homework, quizzes	2b, 3a	
3) Perpendicular lines	7	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
4) Distance		Notes and homework	Worksheets, homework, quizzes	2b, 3a	
5)					
Key Activities and Methods: Discussion, graded homework, mimio examples					

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# UNIT PLANNER

Teacher's Name: Lehman		Subject: Geometry		Period(s): 5	
Unit #: 4	Dates - Starting:		Ending:	Total Instructional Days:	
Unit Title: Chapter 4 Congruent Triangles					
Theme: same					
Biblical Application: We are unique yet alike					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1)Classifying triangles	12	Notes and homework	Worksheets, homework, quizzes	3a	
2)Proving congruence	4	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
3)					
4)					
5)					
Key Activities and Methods: Discussion, graded homework, mimio examples					

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

# UNIT PLANNER

Teacher's Name: Lehman		Subject: Geometry		Period(s): 5	
Unit #: 5	Dates - Starting: Ending:		Total Instructional Days:		
Unit Title: Chapter 5 Relationships in Triangles					
Theme: same					
Biblical Application: Community					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1) Bisectors		Notes and homework	Worksheets, homework, quizzes	3a	
2) Medians and altitudes	13	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
3) Indirect proofs	13	Notes and homework	Worksheets, homework, quizzes	2b, 3a	
4)					
5)					
Key Activities and Methods: Discussion, graded homework, mimio examples					

**PACING GUIDE**

 Subject: Geometry

Grade: \_8th

Total number of standards: \_\_\_\_

Quarter	Units Taught	Standards Taught	Standards Assessed
1			
2			
3	<b>Chapter 1 Geometry</b> (Points, Lines, Planes and Angles); <b>Chapter 2 Geometry</b> (Reasoning and Proof); <b>Chapter 3 Geometry</b> (Parallel and Perpendicular Lines)	Geometry 2,3,7	Geometry 2,3,7
4	<b>Chapter 4 Geometry</b> (Congruent Triangles)' <b>Chapter 5 Geometry</b> (Relationships in Triangles) ; <b>Chapter 7 Geometry</b> (Right Triangles and Trigonometry) – not tested	Geometry 4,12,13	Geometry 4,12,13
<b>Omitted Standards and why</b>			

# HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

## Mission Statement

"Our mission is to educate students to know Christ personally, excel academically, think biblically, and positively impact their community for Christ."

## Expected Schoolwide Learning Results (ESLRs)

### 1. Biblical World View

*Graduates of HCJH are expected to be individuals who . . .*

- a) know how to study the Bible.
- b) recognize that all people are created in the image of the one true God.
- c) acknowledge the Bible as the infallible Word of God.
- d) use God's Word to discern truth.

### 2. Effective Communicators

*Graduates of HCJH are expected to be effective communicators who . . .*

- a) listen objectively and critically.
- b) understand and follow directions.
- c) write and speak clearly and accurately.
- d) express and support opinions using objective evidence.
- e) utilize various modalities effectively.
- f) can demonstrate a personal relationship with Jesus Christ verbally and in writing.

### 3. Proficient Learners

*Graduates of HCJH are expected to be proficient learners who . . .*

- a) demonstrate grade appropriate skills in reading, writing, and mathematics.
- b) have effective work habits and study skills.
- c) are self-directed and able to produce cooperatively and independently.
- d) can utilize technology.
- e) have a firm grasp of scripture and are able to apply it to life situations.

### 4. Personal Responsibility

*Graduates of HCJH are expected to be responsible individuals who . . .*

- a) show patriotism through respect for flag, country, leaders and laws.
- b) demonstrate self-control based on biblical standards.
- c) exhibit respect for others.
- d) accept the consequences and benefits of their actions.
- e) are aware of career opportunities.
- f) practice goal setting with a biblical perspective.
- g) are involved in serving the community.
- h) have a personal relationship with Jesus Christ.
- i) have the tools to share their faith.
- j) demonstrate an urgency to share their faith.

### 5. Problem Solvers

*Graduates of HCJH are expected to be perceptive thinkers and problem solvers who . . .*

- a) evaluate current topics using a biblical perspective.
- b) use available technology to obtain, access and integrate relevant information.
- c) think analytically and creatively.
- d) are well-informed and open-minded.
- e) apply academic learning to life.

### 6. Well-Rounded

*Graduates of HCJH are expected to be well-rounded individuals who . . .*

- a) have been exposed to a variety of elective opportunities and experiences.
- b) are challenged beyond academics through a variety of extracurricular activities.
- c) lead lives that are balanced intellectually, spiritually, physically and emotionally.
- d) develop an appreciation for teamwork during school activities.
- e) understand God's involvement in every area of their lives.

## Geometry

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The geometry skills and concepts developed in this discipline are useful to all students. Aside from learning these skills and concepts, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems.

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- 1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.

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- 2.0 Students write geometric proofs, including proofs by contradiction.

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- 3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.

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- 4.0 Students prove basic theorems involving congruence and similarity.

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- 5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.

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- 6.0 Students know and are able to use the triangle inequality theorem.

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- 7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

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- 8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

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- 9.0 Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.

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- 10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.

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- 11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.

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- 12.0** Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.
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- 13.0** Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.
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- 14.0** Students prove the Pythagorean theorem.
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- 15.0** Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.
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- 16.0** Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.
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- 17.0** Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.
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- 18.0** Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example,  $\tan(x) = \sin(x)/\cos(x)$ ,  $(\sin(x))^2 + (\cos(x))^2 = 1$ .
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- 19.0** Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.
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- 20.0** Students know and are able to use angle and side relationships in problems with special right triangles, such as  $30^\circ$ ,  $60^\circ$ , and  $90^\circ$  triangles and  $45^\circ$ ,  $45^\circ$ , and  $90^\circ$  triangles.
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- 21.0** Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
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- 22.0** Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.