Managed Curriculum

RSD LOUISIANA

Geometry

2011-2012 School Year

John White, RSD Superintendent

Geometry
High School

RSD LOUISIANA

GEE TEST SPECIFICATIONS

Number & Number Relations	10%
Algebra	15%
Measurement	15%
Geometry	20%
Data Analysis, Probability, Discrete Math.	20%
Patterns, Relations, & Functions	20%
Number of GLEs	27

The 2011-2012 Managed Curriculum

Teaching Mathematics for Meaning and Understanding

Research on teaching and learning document the need for educators to alter present teaching practices in order to close the achievement and to support improved student achievement in mathematic. The research message is strong: ***Teach for meaning initially, or risk never getting students beyond a superficial understanding that leaves them unprepared to apply their learning.*** Simply stated, educators can incorporate the following steps to put the research into practice.

- Promote students' discussion of making meaning by posing open-ended questions: *Why do you think that? Can you explain your reasoning? How do you know that?*
- Make explicit connections and incorporate pictures, concrete materials, and role playing as part of instruction so that students have multiple representations of concepts and alternative paths to developing understanding.
- Avoid instruction focused on teaching a single correct approach to arrive at a single correct answer.

The following list of best practices in mathematics is suggested to aid in the teaching and learning process daily.

- Use manipulative materials
- Use cooperative group work
- Discuss mathematics
- Question and make conjectures
- Justify thinking
- Write about mathematics
- Use a problem-solving approach to instruction
- Integrate content
- Use calculators and computers
- Be a facilitator of learning
- Assess learning as an integral part of instruction
- Use data to guide/drive instruction
- Solve problems in real world settings

Pacing for Content Coverage

There is much mathematics content to review and teach in the course of a year. The expectation is that the pace is set at the beginning of the school year. Students generally adjust to the pace of the teacher. This will ensure that *ALL* of the concepts will be covered. There may be times when it will seem difficult to maintain the pace. But it is important to understand that a slow pace can make it too easy to lose perspective and difficult to relate ideas. If you spend too much time on certain lessons, you will find that your slowest students may have learned more by having gone through content slowly, but the other students may have learned less. The wise teacher strikes a balance, goes quickly enough to keep things interesting but slowly enough to have time for explanations. Make adjustments for students with special needs: individualized lessons, learner center activities, additional homework and/or extended day/week/year opportunities.

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Key Concepts for GEE Assessment

At the high school level, students should be able to solve complex problems involving several steps and problems that suggest algorithmic solutions. Word problems may involve integers, fractions, and decimals, with considerable emphasis on those involving ratio and proportion. Students are expected to understand and use all real numbers (both rational and irrational). Students analyze patterns in data and represent them algebraically. Real-world problems that require algebraic solutions are not exclusively linear; they may involve exponents. In Measurement, students should learn to measure, record, and communicate the perimeter and area of plane figures and the volume of containers. The focus is on solving real-world measurement problems with or without the use of measurement tools. Students are provided with a Mathematics Reference Sheet of formulas and equivalencies (unit conversions) for items assessing Measurement. In geometry, students should understand the concept of slope and use of the coordinate plane and coordinate methods to solve real-world problems. Formulas required to solve problems are provided on the Mathematics Reference Sheet, rather than embedded in relevant questions.
Students should be able to interpret and summarize the meaning of a set of experimental data presented in a table or a bar, line, or circle graph in the context of a given scientific experiment. They should also be able to select the most appropriate type of graph for a particular data set and construct, label, and scale bar and line graphs. Students represent number patterns using function tables, graphs, or equations in the context of an experiment.

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All benchmarks, except the following, are eligible for assessment items. *The benchmarks* Not Directly assessed include:

- N-1-H demonstrating an understanding of the real number system
- G-4-H using inductive reasoning to predict, discover, and apply geometric properties and relationships (i.e, patty paper constructions, sum of the angles in a polygon)
- N-4-H determining whether an exact or approximate answer is necessary
- N-7-H justifying reasonableness of solutions and verifying results
- P-5-H analyzing real-world relationships that can be modeled by elementary functions
- D-3-H using simulations to estimate probabilities (for example, lists and tree diagrams)
- D-5-H recognizing events as dependent or independent in nature and demonstrating techniques for computing multiple-event probabilities
- D-6-H recognizing and answering questions about data that are normally or non-normally distributed
- D-8-H using logical thinking procedures, such as flow charts, Venn diagrams, and truth tables
- Logical thinking procedures (for example, flow charts and truth tables) are not directly assessed. Venn diagrams are assessed under benchmarks D-1-H and D-4-H.

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GEE Test consists of the following sessions:

- Session 1: 30 multiple-choice items without calculators
- Session 2: 30 multiple-choice items with calculators
- Session 3: 4 constructed-response items with calculators

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OPENING OF SCHOOL INTRODUCTORY UNIT	
Teachers should use this unit to: ▪ establish classroom routines ▪ develop classroom culture to shape the mind ▪ administer Pre test to determine students' strengths and weaknesses ▪ practice using calculators with meaningful activities ▪ practice and use problem solving skills and strategies ▪ practice and use test taking strategies	**Suggested Resources** ▪ CHAMP Module 4 ▪ Guide to Problem Solving ▪ Guide to Test Taking ▪ Calculator Practice ▪ Louisiana Guide to Statewide Assessment

Unit 1: Geometric Patterns and Reasoning

Unit Description

This unit introduces the use of inductive reasoning to extend a pattern and then find the rule for generating the *n*th term in a sequence. Additionally, counting techniques and mathematical modeling, including line of best fit, will be used to find solutions to real life problems.

Student Understandings

Students apply inductive reasoning to identify terms of a sequence by generating a rule for the *n*th term. Students recognize linear versus non-linear sets of data and can justify their reasoning. Students can apply counting techniques to solve real-life problems.

Guiding Questions

Can students…

- give examples of correct and incorrect usage of inductive reasoning?
- use counting techniques with patterns to determine the number of diagonals and the sums of angles in polygons?
- state the characteristics of a linear set of data?
- determine the formula for finding the *n*th term in a linear data set?
- solve a real-life sequence problem based on counting?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
5 17 20 26 27	Students will: ▪ use inductive reasoning to predict, discover, and apply geometric properties and relationships. ▪ write the equation of a line of best fit for a set of 2-variable real-life data presented in table or scatter plot form, with or without technology. ▪ show or justify the correlation (match) between a linear or non-linear data set and a graph. ▪ determine the formula for finding the nth term in a pattern or table.	Inductive Reasoning Conjecture Counterexample	**LCC Activities:** 1-5 ▪ Blackline Masters pp. 1-16 Epic: Module 2 Lesson 1 Glencoe Geometry ▪ Chapter 2 sec. 1 (pp. 62-66) Prentice Hall Geometry ▪ Chapter 1 sec. 1 (pp. 4-9) Cognitive Tutor
5 20 24 25 26 27	Students will: ▪ use counting techniques to solve real-life problems. ▪ understand and determine when to use combinations and permutations. *(The underlined objective is not covered in the Geometry book nor Geometry Epic Modules. Therefore, the underlined resources may be found in the Algebra 1 Textbook & Epic Module)* ▪ understanding basic terms and postulates of geometry.	Factorial Permutations Combinations Daily Warm-ups with vocabulary	**LCC Activities:** 6-8, U 2: Daily Warm-ups Epic Module 1 Lesson 1 ▪ Module 6 Lesson 2 ▪ *Algebra 1B: Module 5 Lesson 5* Glencoe Geometry ▪ Chapter 1 sec. 1 (pp. 6-12) ▪ Algebra Chapter 14 sec. 1, 2 Prentice Hall Geometry ▪ Chapter 1 sec.3, 4 (pp. 17-33) Cognitive Tutor Algebra I *Unit 42* Cognitive Tutor Bridge to Algebra *Unit 47*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Unit 1: Geometric Patterns and Reasoning

Teacher Reflection on Content Coverage

Can students…

- give examples of correct and incorrect usage of inductive reasoning?
- use counting techniques with patterns to determine the number of diagonals and the sums of angles in polygons?
- state the characteristics of a linear set of data?
- determine the formula for finding the *n*th term in a linear data set?
- solve a real-life sequence problem based on counting?

Unit 2: Reasoning and Proof

Unit Description

This unit introduces the development of arguments for geometric situations. Conjectures and convincing arguments are first based on experimental data, then are developed from inductive reasoning, and, finally, are presented using deductive proofs in two-column, flow patterns, paragraphs, and indirect formats.

Student Understandings

Students understand the basic role proof plays in mathematics. Students come to distinguish proofs from convincing arguments. They understand that proof may be generated by first providing numerical arguments such as measurements and then replace the measurements with variables.

Guiding Questions

Can students…

- develop inductive arguments for conjectures and offer reasons supporting their validity?
- develop short algorithmic-based proofs that generalize numerical arguments?
- develop more general arguments based on definitions and basic axioms and postulates?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
10 11 17 19	Students will: ▪ use deductive reasoning. ▪ compare and contrast inductive and deductive reasoning. ▪ develop inductive arguments to form conjectures to find the measures of segments and angles. ▪ develop informal proofs. ▪ determine angle measurements using the properties of parallel, perpendicular, and intersecting lines in a plane.	Deductive Reasoning	**LCC Activities:** 1-4 & 9 ▪ Blackline Masters pp. 17-19 Epic ▪ Module 2 Lesson 1 & 3 ▪ Module 1 Lesson 2, 4 & 5 Glencoe Geometry ▪ Chapter 2 sec.4 (pp. 82-87) Prentice Hall Geometry ▪ Chapter 2 sec. 3 (pp. 82-88) ▪ Chapter1 sec. 4 (pp. 25-33) Cognitive Tutor Geometry *Units 1, 2, 3, 4, 6, 7, 16, 17, 23, 24*

Teacher Reflection on Content Coverage Can students…

- develop inductive arguments for conjectures and offer reasons supporting their validity?
- develop short algorithmic-based proofs that generalize numerical arguments?
- develop more general arguments based on definitions and basic axioms and postulates?

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Unit 3: Parallel and Perpendicular Relationships

Unit Description

This unit demonstrates the basic role played by Euclid's fifth postulate in geometry. The focus is on the basic angle measurement relationships for parallel and perpendicular lines, the equations of lines that are parallel and perpendicular in the coordinate plane, and proving that two or more lines are parallel using various methods including distance between two lines.

Student Understandings

Students should know the basic angle measurement relationships and slope relationships between parallel and perpendicular lines in the plane. Students can write and identify equations of lines that represent parallel and perpendicular lines. They can recognize the conditions that must exist for two or more lines to be parallel. Three-dimensional figures can be connected to their 2-dimensional counterparts when possible.

Guiding Questions

Can students…

- relate parallelism to Euclid's fifth postulate and its ramifications for Euclidean Geometry?
- use parallelism to find and develop the basic angle measurements related to triangles and to transversals intersecting parallel lines?
- link perpendicularity to angle measurements and to its relationship with parallelism in the plane and 3-dimensional space?
- solve problems given the equations of lines that are perpendicular or parallel to a given line in the coordinate plane and discuss the slope relationships governing these situations?
- solve problems that deal with distance on the number line or in the coordinate plane?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
6 10 16 19	Students will: ▪ represent and solve problems involving distance on a number line or in the plane. ▪ determine and use the slope of a line. ▪ to find and relate slopes of parallel and perpendicular lines. ▪ write the equation of a line parallel or perpendicular to a given line through a specific point..	Y-Intercept Form slope-Intercept Form	**LCC Activities:** 1-5 ▪ Blackline Masters pp. 28-36 Epic ▪ Module 1 Lessons 2,3,6 ▪ Module 10 Lessons 1-4 Glencoe Geometry ▪ Chapter 3 sec.3,4 (pp. 139-150) Prentice Hall Geometry ▪ Chapter 3 sec. 5,6 (pp. 151-164) ▪ Chapter 1 sec. 6 (pp. 43-50) Cognitive Tutor Geometry *Units 1, 3, 4, 6, 16, 17, 23, 24, 29, 30*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

10 11 19	Students will: ▪ determine angle measurements using the properties of parallel, perpendicular, and intersecting lines in a plane. ▪ identify angles formed by two lines and a transversal. ▪ to prove and use properties of parallel lines. ▪ understand and use the Triangle Sum and Exterior Angle theorems.	corresponding Angles consecutive Interior Angles alternate Interior angles alternate exterior angles exterior angles remote interior angles	**LCC Activities:** 6, 7 ▪ Blackline Masters pp. 24-27 Epic ▪ Module 1 Lessons 4,5,6 ▪ Module 3 Lessons 1,2 Glencoe Geometry ▪ Chapter 3 sec. 1-2 (pp. 126-138) ▪ Chapter 1 sec. 5 (pp. 37-43) ▪ Chapter 4 sec. 2 (pp. 184-191) Prentice Hall Geometry ▪ Chapter 3 sec. 1-3 (pp. 113-142) Cognitive Tutor Geometry *Units 1, 2, 3, 4, 6, 16, 17, 23, 24*

Teacher Reflection on Content Coverage

Can students…

- relate parallelism to Euclid's fifth postulate and its ramifications for Euclidean Geometry?
- use parallelism to find and develop the basic angle measurements related to triangles and to transversals intersecting parallel lines?
- link perpendicularity to angle measurements and to its relationship with parallelism in the plane and 3-dimensional space?
- solve problems given the equations of lines that are perpendicular or parallel to a given line in the coordinate plane and discuss the slope relationships governing these situations?
- solve problems that deal with distance on the number line or in the coordinate plane?

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Unit 4: Triangles and Quadrilaterals

Unit Description

This unit introduces the various postulates and theorems that outline the study of congruence and similarity. The focus is on similarity and congruence treated as similarity with a ratio of 1 to 1. It also includes the definitions of special segments in triangles, classic theorems that develop the total concept of a triangle, and relationships between triangles and quadrilaterals that underpin measurement relationships. The properties of the special quadrilaterals (parallelograms, trapezoids, and kites) are also developed and discussed.

Student Understandings

Students should know defining properties and basic relationships for all forms of triangles and quadrilaterals. They should also be able to discuss and apply the congruence postulates and theorems and compare and contrast them with their similarity counterparts. Students should be able to apply basic classical theorems, such as the isosceles triangle theorem, triangle inequality theorem, and others.

Guiding Questions

Can students…

- illustrate the basic properties and relationships tied to congruence and similarity?
- develop and prove conjectures related to congruence and similarity?
- draw and use figures to justify arguments and conjectures about congruence and similarity?
- state and apply classic theorems about triangles, based on congruence and similarity patterns?
- construct the special segments of a triangle and apply their properties?
- determine the appropriate name of a quadrilateral given specific properties of the figure?
- apply properties of quadrilaterals to find missing angle and side measures?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
10 18 19	Students will: ▪ use and apply properties of isosceles triangles. ▪ recognize congruent and corresponding parts of triangles. ▪ determine angle measures and side lengths of right and similar triangles using trigonometric ratios and properties of similarity, including congruence. ▪ develop formal and informal proofs to prove triangles congruent.	base angles legs vertex angle congruent similar	**LCC Activities:** 1-6, 10 ▪ Blackline Masters pp. 37-48 pp. 54-57 Epic ▪ Module 4 Glencoe Geometry ▪ Chapter 4 sec.3-7(pp. 192-226) Prentice Hall Geometry ▪ Chapter 4 (pp. 179-236) Cognitive Tutor Geometry *Units 1, 3, 4, 6, 16, 17, 21, 22, 23, 24, 25*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
6 10	Students will: ▪ understand, construct, and apply properties of triangle: altitudes, bisectors, and medians. ▪ form and test conjectures concerning geometric relationships including lines, angles, and polygons. ▪ understand and Use Triangle Inequality Properties involving its sides and angles.	altitude of a triangle angle bisector perpendicular bisector medians concurrent lines point of concurrency centroid circumcenter incenter orthocenter	**LCC Activities:** 7-9, 11-13 ▪ Blackline Masters pp. 49,50 Epic Module 3 Lesson 4, 5 ▪ Module 4 Glencoe Geometry ▪ Chapter 5 (pp.238-277) Prentice Hall Geometry ▪ Chapter 5 sec.2,3 (pp. 249-263) ▪ Chapter 5 sec.5 (pp. 273-280) Cognitive Tutor Geometry *Units 1, 3, 6, 16, 17, 23, 24, 29*
6 10	Students will: ▪ identify, apply, and prove similar triangles. ▪ define and classify quadrilaterals. ▪ understand and use properties of sides, angles, and diagonals of quadrilaterals. ▪ write the equation of a line parallel or perpendicular to a given line through a specific point. ▪ form and test conjectures concerning geometric relationships including lines, angles, and polygons. ▪ represent and solve problems involving distance on a number line or in the plane.	quadrilateral parallelogram square rectangle rhombus trapezoid isosceles trapezoid kite	**LCC Activities:** 14-18 ▪ Blackline Masters pp. 51-53 pp. 58,59 Epic :Module7 Lessons 1-4 ▪ Module 5 Glencoe Geometry ▪ Chapter 6 ,1-3 (pp.281-306) ▪ Chapter 8 ,2-7 (pp.411-451) Prentice Hall Geometry ▪ Chap 8 sec. 1-3 (pp.416-438) ▪ Chap 6, 1-5 (pp. 287-325) Cognitive Tutor Geometry *Units 1, 3, 6, 16, 17, 23, 24, 29*

Teacher Reflection on Content Coverage

Can students…

- illustrate the basic properties and relationships tied to congruence and similarity?
- develop and prove conjectures related to congruence and similarity?
- draw and use figures to justify arguments and conjectures about congruence and similarity?
- state and apply classic theorems about triangles, based on congruence and similarity patterns?
- construct the special segments of a triangle and apply their properties?
- determine the appropriate name of a quadrilateral given specific properties of the figure?
- apply properties of quadrilaterals to find missing angle and side measures?

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Unit 5: Similarity and Trigonometry

Unit Description

This unit addresses the measurement side of the similarity relationship which is extended to the Pythagorean theorem, its converse, and their applications. The three basic trigonometric relationships are defined and applied to right triangle situations.

Student Understandings

Students apply their knowledge of similar triangles to finding the missing measures of sides of similar triangles, and to using the Pythagorean theorem to find the length of missing sides in a right triangle. The converse of the Pythagorean theorem is used to determine whether a given triangle is a right, acute, or obtuse triangle. Students can use *sine*, *cosine*, and *tangent* to find lengths of sides or measures of angles in right triangles and the relationship to similarity.

Guiding Questions

Can students…

- use proportions to find the lengths of missing sides of similar triangles?
- use similar triangles and other properties to prove and apply the Pythagorean theorem and its converse?
- students relate trigonometric ratio use to knowledge of similar triangles?
- use *sine, cosine*, and *tangent* to find the measures of missing sides or angle measures in a right triangle

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
2 4 10 18	Students will: ▪ predict the effect of operations on real numbers (ratios). ▪ use proportions to find the lengths of missing sides of similar triangles. ▪ use ratios and proportional reasoning to solve a variety of real-life problems including similar figures and scale drawings.	ratio proportion cross products scale factor	**LCC Activities:** 1-6 ▪ Blackline Masters pp.60-65 Epic ▪ Module 7 Glencoe Geometry ▪ Chapter 6 ,1-4 (pp.281-315) Prentice Hall Geometry ▪ Chapter 8, (pp. 415-444) Cognitive Tutor Geometry *Units 1, 3, 6, 16, 17, 23, 24* Cognitive Tutor A2 *Units 33, 37*
10 12 18	Students will: ▪ use proportional parts of triangles and divide a segment into parts. ▪ use similar triangles and other properties to prove and apply the Pythagorean Theorem and its converse. ▪ identify and apply properties of special right triangles.	midsegment Pythagorean triple	**LCC Activities:** 7-10 Epic: Module 8 Lessons 1-4 Glencoe Geometry ▪ Chapter 6, (pp.307-315) ▪ Chapter 7 ,(pp.350-363) Prentice Hall Geometry ▪ Chapter 8, (pp. 446-452) ▪ Chapter 7, (pp. 357-372) Cognitive Tutor Geometry *Units 18, 19, 21, 22, 24, 25*

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Unit 5: Similarity and Trigonometry

Teacher Reflection on Content Coverage

Can students…

- use proportions to find the lengths of missing sides of similar triangles?
- use similar triangles and other properties to prove and apply the Pythagorean theorem and its converse?
- students relate trigonometric ratio use to knowledge of similar triangles?
- use *sine, cosine*, and *tangent* to find the measures of missing sides or angle measures in a right triangle?

Unit 8: Transformations

Unit Description

. This unit provides a deeper mathematical understanding and justifications for transformations that students have seen in previous grades. The focus is providing justifications for the congruence and similarity relationships associated with translations, reflections, rotations, and dilations (centered at the origin).

Student Understandings

Students can determine what transformations have been performed on a figure and can determine a composition of transformations that can be performed to mimic other transformations like rotations. They are also able to find new coordinates for transformations without actually performing the indicated transformation.

Guiding Questions

Can students…

- find transformations and mappings that relate one congruent figure in the plane to another?
- provide an argument for the preservation of measures of figures under reflections, translations, and rotations?
- find the dilation (magnification), centered at the origin, of a specified figure in the plane and relate it to a similarity mapping?
- perform a composition of transformations and explain its relationship to single transformations or other compositions that produce the same image?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
7 14	Students will: ▪ provide convincing arguments for the surface area and volume formulas for spheres. ▪ find transformations and mappings that relate one congruent figure in the plane to another provide an argument for the preservation of measures of figures under reflections, translations, and rotations.	symmetry reflection rotation translation	**LCC Activities:** 13-14, 1-5 ▪ Blackline Masters pg. 81 Epic ▪ Module 11 Glencoe Geometry ▪ Chapter 9 sec.1-3 (pp.460-482) ▪ Chapter 12 sec. (pp.671-677) ▪ Chapter 13 sec.3 (pp.702-706) Prentice Hall Geometry ▪ Chapter 10 sec.7 (pp. 558-564) ▪ Chapter 12 sec. 1-5(pp.634-666) Cognitive Tutor Geometry *Units 31, 37, 38, 39*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Unit 8: Transformations			
GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
14 15	Students will: ▪ find the dilation (enlargement or reduction), centered at the origin, of a specified figure in the plane and relate it to a similarity mapping. ▪ perform a composition of transformations and explain its relationship to single transformations or other compositions that produce the same image.	dilation	**LCC Activities:** 6, 7 Epic ▪ Module 11 Glencoe Geometry ▪ Chapter 9 sec.5 (pp.490-497) Prentice Hall Geometry ▪ Chapter 12 sec.7 (pp.674-679) Cognitive Tutor Geometry *Unit 31*
Teacher Reflection on Content Coverage Can students… • find transformations and mappings that relate one congruent figure in the plane to another? • provide an argument for the preservation of measures of figures under reflections, translations, and rotations? • find the dilation (magnification), centered at the origin, of a specified figure in the plane and relate it to a similarity mapping? • perform a composition of transformations and explain its relationship to single transformations or other compositions that produce the same image?			

Unit 6: Area, Polyhedra, Surface Area, and Volume

Unit Description

This unit provides an examination of properties of measurement in geometry. While students are familiar with the area, surface area, and volume formulas from previous work, this unit provides justifications and extensions of students' previous work. Significant emphasis is given to 3-dimensional figures and their decomposition for surface area and volume considerations. .

Student Understandings

Students understand that measurement is a choice of unit, an application of that unit (covering, filling) to the object to be measured, a counting of the units, and a reporting of the measurement. Students should have a solid understanding of polygons and polyhedra, what it means to be regular, what parallel and perpendicular mean in 3-dimensional space, and why pyramids and cones have a factor of 1/ 3 in their formulas.

Guiding Questions

Can students…

- find the perimeters and areas of triangles, standard quadrilaterals, and regular polygons, as well as irregular figures for which sufficient information is provided?
- provide arguments for the validity of the standard planar area formulas?
- define and provide justifications for polygonal and polyhedral relationships involving parallel bases and perpendicular altitudes and the overall general *V=Bh* formula, where *B* is the area of the base?
- use the surface area and volume formulas for rectangular solids, prisms, pyramids, and cones?
- find distances in 3-dimensional space for rectangular solids using generalizations of the Pythagorean theorem?
- use area models to substantiate the calculations for conditional/geometric probability arguments?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
9 10	Students will: ▪ find the perimeters and areas of triangles, standard quadrilaterals, and regular polygons, as well as irregular figures. ▪ provide arguments for the validity of the standard planar area formulas. ▪ define and provide justifications for polygonal and polyhedral relationships involving parallel bases and perpendicular altitudes and the overall general *V=Bh* formula, where *B* is the area of the base.	polyhedral	**LCC Activities:** 1-6 Epic ▪ Module 3 Lessons 3 ▪ Module 5 Lessons 4 ▪ Module 6 Lessons 3,4 ▪ Module12 Glencoe Geometry ▪ Chapter 11sec.1-3 (pp.592-621) Prentice Hall Geometry ▪ Chapter 1, (pp. 51-59) ▪ Chapter 7, (pp. 347-354) ▪ Chapter 7, (pp. 373-401) ▪ Chapter 8 sec. 6(pp. 454-459) Cognitive Tutor Geometry *Units 1, 3, 6, 16, 17, 23, 24*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
7 21	students will: ▪ find the volume and surface area of pyramids, spheres, and cones. ▪ find distances in 3-dimensional space for rectangular solids using generalizations of the Pythagorean theorem. ▪ use area models to substantiate the calculations for conditional/geometric probability arguments.	face edges bases prism geometric probability	**LCC Activities:** 7-11 Epic ▪ Module 12, 9 Glencoe Geometry ▪ Chapter 11 sec. 5 (pp.622-627) ▪ Chapter 12 sec.5-7 (pp.660-667) ▪ Chapter 13 sec.2,3 (pp.696-706) Prentice Hall Geometry ▪ Chapter 10 sec. 3-8 (pp. 528-571) ▪ Chapter 7 sec. 2,3 (pp. 357-372) ▪ Chapter 7 sec.8 (pp. 402-410) Cognitive Tutor Geometry *Units 37, 38, 39* Cognitive Tutor Algebra I *Unit 42* Cognitive Tutor Bridge to Algebra *Unit 47* Cognitive Tutor Algebra II *Unit 45*

Teacher Reflection on Content Coverage

Can students…

- find the perimeters and areas of triangles, standard quadrilaterals, and regular polygons, as well as irregular figures for which sufficient information is provided?
- provide arguments for the validity of the standard planar area formulas?
- define and provide justifications for polygonal and polyhedral relationships involving parallel bases and perpendicular altitudes and the overall general *V=Bh* formula, where *B* is the area of the base?
- use the surface area and volume formulas for rectangular solids, prisms, pyramids, and cones?
- find distances in 3-dimensional space for rectangular solids using generalizations of the Pythagorean theorem?
- use area models to substantiate the calculations for conditional/geometric probability arguments?

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Unit 7: Circles and Spheres

Unit Description

This unit focuses on justifications for circular measurement relationships in two and three dimensions, as well as the relationships dealing with measures of arcs, chords, secants, and tangents related to a circle. It also provides a review of formulas for determining the circumference and area of circles..

Student Understandings

Students can find the surface area and volume of spheres. Students understand the relationship of the measures of minor and major arcs to the measures of central angles and inscribed angles, and to the circumference. They can also explain the relevance of tangents in real-life situations and the power of a point relationship for intersecting chords.

Guiding Questions

Can students…

- provide an argument for the value of π and the way in which it can be approximated by polygons?
- provide convincing arguments for the surface area and volume formulas for spheres?
- apply the circumference, surface area, and volume formulas for circles, cylinders, cones, and spheres?
- apply geometric probability concepts using circular area models and using area of a sector?
- find the measures of inscribed and central angles in circles, as well as measures of sectors, chords, and tangents to a circle from an external point?
- use the power of a point theorem (intersecting chords and intersecting secants) to determine measures of intersecting chords in a circle?

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
13 21 22	Students will: ▪ provide an argument for the value of π and the way in which it can be approximated by polygons. ▪ apply the circumference, surface area, and volume formulas for circles, cylinders, cones, and spheres.	central angle arc concentric circles major arc minor arc semicircle arc length	**LCC Activities:** 1-6 ▪ Blackline Masters pp.66-72 Glencoe Geometry ▪ Chapter 10 sec.1 (pp.522-528) ▪ Chapter 12 sec.4 (pp.655-659) ▪ Chapter 12 sec.6-7 (pp.666-677) ▪ Chapter 13 sec.1-3 (pp.688-708) Prentice Hall Geometry ▪ Chapter 7, (pp. 386-400) ▪ Chapter 10. (pp. 528-572) Cognitive Tutor Geometry *Units 32, 33, 34* Cognitive Tutor Algebra I *Unit 42* Cognitive Tutor Bridge to Algebra *Unit 47* Cognitive Tutor Algebra II *Unit 45*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.

Units to Revisit if Time Permits

GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
13 21	Students will: ▪ apply geometric probability concepts using circular area models and using area of a sector. ▪ find the measures of inscribed and central angles in circles, as well as measures of sectors, chords, and tangents to a circle from an external point. ▪ use the power of a point theorem (intersecting chords and intersecting secants) to determine measures of intersecting chords in a circle.	chord tangent secant inscribed angle sector	**LCC Activities:** 7-12 ▪ Blackline Masters pp.73-80 Epic Module 9 Glencoe Geometry ▪ Chapter 10 (pp.520-588) ▪ Chapter 11 sec.3 (pp.610-616) ▪ Chapter 11 sec.5 (pp.622-627) Prentice Hall Geometry ▪ Chapter 11 (pp. 581-630) ▪ Chapter 7 sec.8 (pp. 402-410) Cognitive Tutor Geometry *Units 32, 33, 34* Cognitive Tutor Algebra I *Unit 42* Cognitive Tutor Bridge to Algebra *Unit 47* Cognitive Tutor Algebra II *Unit 45*

Teacher Reflection on Content Coverage

Can students…

- provide an argument for the value of π and the way in which it can be approximated by polygons?
- provide convincing arguments for the surface area and volume formulas for spheres?
- apply the circumference, surface area, and volume formulas for circles, cylinders, cones, and spheres?
- apply geometric probability concepts using circular area models and using area of a sector?
- find the measures of inscribed and central angles in circles, as well as measures of sectors, chords, and tangents to a circle from an external point?
- use the power of a point theorem (intersecting chords and intersecting secants) to determine measures of intersecting chords in a circle?

Unit 5: Similarity and Trigonometry			
GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
3 8 18	Students will: ▪ relate trigonometric ratio to their knowledge of similar triangles. ▪ model and use trigonometric ratios to solve problems involving right triangles. ▪ determine angle measures and side lengths of right and similar triangles using trigonometric ratios and properties of similarity, including congruence.	trigonometric ratio sine cosine tangent angle of Elevation angle of depression	**LCC Activities:** 12-14 Epic: Module 8 Lessons 5 & 6 Glencoe Geometry ▪ Chapter 7 sec. 4 & 5 (pp.364-376) Prentice Hall Geometry ▪ Chapter 9 sec.1-3 (pp. 469-489) Cognitive Tutor Geometry *Units 19, 21, 22, 24, 25* Cognitive Tutor Algebra II *Units 38, 39*
Unit 2: Reasoning and Proof			
GLEs	Teaching Objectives	Vocabulary	Suggested Resources and LCC Activities
11 19 23	Students will: ▪ develop formal and informal proofs. ▪ draw and justify conclusions based on the use of logic. (e.g., conditional statements, converse, inverse, contra positive). ▪ understand the Laws of Detachment and Syllogism.	Law of Detachment Law of Syllogism	**LCC Activities:** 5-8 ▪ Blackline Masters pp. 20-23 Epic ▪ Module 2 Lesson 2,4,5,6 Glencoe Geometry ▪ Chapter 2 sec. 2-7 (pp. 67-106) Prentice Hall Geometry ▪ Chapter 2 (pp. 67-109) Cognitive Tutor Geometry *Units 2, 3, 4, 17, 23, 24*

Note: Differentiated instruction activities for students who are advanced, Tier II, Tier III, or English Language Learners can be found in the wrap-around text of the Teacher's Edition on the text pages indicated.