

**Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry**

Chapter 1: An Informal Introduction to Geometry

Suggested Time frame: 21 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).</p> <p>G-MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</p> <p>G-MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering)</p> <p>MP-7 Look for and make use of structure (reducing problems to simpler ones)</p>	<p>An Informal Introduction to Geometry</p> <ul style="list-style-type: none"> • Picturing and Drawing • Constructing • Geometry Software • Invariants <p>Unit vocabulary and notation: CME Text - page 3</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Visualize objects and draw two and three-dimensional objects. • Discover the difference between a drawing and a geometry construction. • Use geometry software to learn about the features of many geometric figures. • Look for numerical, geometric and spatial invariants and make conjectures about parallel lines, angles in a triangle, angles in polygons, concurrence of lines, and collinearity of points. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

**Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry**

Chapter 2: Congruence and Proof

Suggested Time frame: 25 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-CO.6 Use descriptions of rigid motions to transform figures and predict effect of given rigid motion on a figure; given two figures, decide if they are congruent.</p> <p>G-CO.7 Use congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and angles are congruent.</p> <p>G-CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS) follow from the definition of congruence via rigid motions.</p> <p>G-CO.9 Prove theorems about lines and angles.</p> <p>G-CO.10 Prove theorems about triangles.</p> <p>G-CO.11 Prove theorems about parallelograms.</p> <p>MA.11a. Prove theorems about polygons.</p> <p>MP-3 Construct viable arguments and critique the reasoning of others.</p> <p>MP-8 Look for and express regularity in repeated reasoning (generalizing repeated calculations)</p>	<p>Congruence and Proof</p> <ul style="list-style-type: none"> • The Congruence Relationship • Proof and Parallel Lines • Writing Proofs • Quadrilaterals and Their Properties <p>Unit vocabulary and notation: CME Text - page 71</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Determine that two figures are congruent using the correct congruence notation, as well as understand that the corresponding parts of congruent triangles are congruent (CPCTC). • Prove two important theorems: <ul style="list-style-type: none"> • <i>The Alternate Interior Parallel Theorem (AIP Theorem)</i> • <i>The Parallel Alternate Interior Theorem (PAI Theorem)</i> • Write proofs using several different methods and prove the statement that the sum of the measures of the angles of a triangle is 180°. • Apply their skills of analysis and exposition to the proof of some important properties of quadrilaterals. • Comprehend the difference between a statement and its converse. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry

Chapter 3: Dissections and Area

Suggested Time frame: 23 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. <i>Use dissection arguments, Cavalieri's principle, and informal limit arguments.</i></p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering)</p> <p>MP-4 Model with mathematics.</p> <p>MP-6 Attend to precision.</p> <p>MP-7 Look for and make use of structure (reducing problems to simpler ones)</p> <p>MP-8 Look for and express regularity in repeated reasoning (generalizing repeated calculations)</p>	<p>Dissections and Area</p> <ul style="list-style-type: none"> • Cut and Rearrange • Area Formulas • Proof by Dissection • Measuring Solids <p>Unit vocabulary and notation: CME Text - page 169</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Cut and rearrange figures to make equal-area figures (or scissor-congruent figures). • Analyze the algorithms they used for these dissections. • Use their dissections to derive area formulas for a parallelogram, a triangle and a trapezoid. • Understand the derivations of the area formulas. • Analyze several pictorial proofs of the Pythagorean Theorem. • Find relationships between surface area and volume and relationships between special types of solids. • Derive the formulas that they use. • Find ways to estimate measurements or make sense of a given formula. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry

Chapter 4: Similarity

Suggested Time frame: 23 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-SRT.1 Verify the properties of dilations given by a center and a scale factor</p> <p>G-SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain the meaning of similarity for triangles as equality of all corresponding pairs of angles and proportionality of all corresponding pairs of sides.</p> <p>G-SRT.3 Use the properties of similarity transformations to establish the Angle-Angle criterion (AA) for two triangles to be similar.</p> <p>G-SRT.4 Prove theorems about triangles.</p> <p>G-SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering)</p> <p>MP-4 Model with mathematics.</p> <p>MP-5 Use appropriate tools strategically.</p> <p>MP-8 Look for and express regularity in repeated reasoning.</p>	<p>Similarity</p> <ul style="list-style-type: none"> • Scaled Copies • Curved or Straight? Just Dilate! • The Side-Splitter Theorems • Defining Similarity <p>Unit vocabulary and notation: CME Text - page 261</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Recognize the attributes of a well-scaled copy of a figure. • Develop the idea of proportionality between figures. • Develop tests to decide whether figures are scaled copies of each other. • Construct dilations using two techniques: <ul style="list-style-type: none"> • The ratio method • The parallel method • Apply the Parallel and Proportional Side-Splitter Theorems in order to identify polygons as scaled copies of each other as well as to prove other geometric results. • Adapt the familiar tests for triangle congruence to develop a set of tests for triangle similarity. • See the relationship between the ratio of the corresponding sides of two similar figures and the ratio of the areas of the figures. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

**Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry**

Chapter 5: Circles

Suggested Time frame: 18 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-C.1 Prove that all circles are similar.</p> <p>G-C.2. Identify and describe relationships among inscribed angles, radii, and chords.</p> <p>G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p>MA.3a. Derive the formula for the relationship between the number of sides and sums of the interior and sums of the exterior angles of polygons and apply to the solutions of mathematical and contextual problems.</p> <p>G-C.4. (+) Construct a tangent line from a point outside a given circle to the circle.</p> <p>MP-4 Model with mathematics.</p> <p>MP-8 Look for and express regularity in repeated reasoning.</p>	<p>Circles</p> <ul style="list-style-type: none"> • Area and Circumference • Circles and π • Classical Results About Circles • Geometric Probability <p>Unit vocabulary and notation: CME Text – page 353</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Estimate the areas of blobs (i.e. irregular shapes with rounded edges). • Prove Theorem 5.4 which states the area of a circle with radius r is kr^2, where k is the area of a circle and with radius one. • Explore geometric probability using the Monte Carlo Method. • Discuss whether a probability of 0 implies that a certain event is impossible. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry

Chapter 6: Using Similarity

Suggested Time frame: 13 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G-SRT.1 Verify the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.</p> <p>G-SRT.2. Given two figures, use definition of similarity to decide if they are similar; explain similarity for triangles as equality of all corresponding pairs of angles and proportionality of all corresponding pairs of sides.</p> <p>G-SRT.3. Use the properties of similarity transformations to establish the Angle-Angle criterion (AA) for two triangles to be similar.</p> <p>G-SRT.4. Prove theorems about triangles.</p> <p>G-SRT.15 Use congruence and similarity criteria to solve problems and to prove relationships in figures.</p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering)</p> <p>MP-5 Use appropriate tools strategically.</p> <p>MP-8 Look for and express regularity in repeated reasoning.</p>	<p>Using Similarity</p> <ul style="list-style-type: none"> • Some Uses of Similarity • Exploring Right Triangles • Volume Formulas <p>Unit vocabulary and notation: CME Text – page 441</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Study classical geometry proofs using similarity, including new proofs of the Pythagorean Theorem and concurrence of medians, as well as the Arithmetic-Geometric Mean Inequality. • Focus on the definition of trigonometric functions as ratios of side lengths in triangles. • Use these functions and their inverses to determine unknown side lengths and angle measures in triangles. • Justify the volume formulas that were previously presented in chapter 4 using Cavalieri’s Principle. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

**Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry**

Chapter 7: Coordinates and Vectors

Suggested Time frame: 15 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G.CO Experiment with transformations in the plane.</p> <p>2. Represent transformations in the plane; describe transformations as functions with inputs and outputs. Compare transformations that preserve distance and angle to those that do not.</p> <p>3. Given a regular polygon, describe identity rotations and reflections.</p> <p>4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and segments.</p> <p>5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure. Specify a sequence of transformations that will carry a given figure onto another.</p> <p>6. Use rigid motions to transform figures and to predict the effect of a given rigid motion on a figure; given two figures, use the definition of congruence to decide if they are congruent.</p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering) MP-4 Model with mathematics.</p>	<p>Coordinates and Vectors</p> <ul style="list-style-type: none"> • Transformations • Geometry in the Coordinate Plane • Connections to Algebra <p>Unit vocabulary and notation: CME Text – page 535</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Use paper folding and constructions to explore reflections and compositions of reflections. • Generate translations and rotations. • Study midpoint and distance formulas. • Prove whether three points are collinear. • Identify parallel and perpendicular lines. • Use points on the coordinate plane as algebraic objects to which they can add and by which they can multiply any real number. • Use vectors to find a new form for an equation of a line. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> • Chapter Assessment • Common Mid-year & Final Exams • Regular (weekly) assessments/quizzes • Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> • Do Now • Presentation of student work • Student notebooks • Facilitated student discourse • Questioning (T>S, S>S) of randomly called students • Open Response questions, writing prompts • Probing for multiple representations • Peer assessment • Student-developed problems and solutions • Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>

**Lawrence Public Schools
Mathematics Curriculum Map, 2014-2015
Geometry**

Chapter 8: Optimization

Suggested Time frame: 16 days

Standards	Concepts	Learning Outcomes	Assessment	Resources
<p>G.MG Apply geometric concepts in modeling situations.</p> <ol style="list-style-type: none"> Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). ★ Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). <p>MA.4. Use dimensional analysis for unit conversion to confirm that expressions and equations make sense.</p> <p>MP-1 Make sense of problems and persevere in solving them (tinkering) MP-4 Model with mathematics.</p>	<p>Optimization</p> <ul style="list-style-type: none"> Making the Least of a Situation Making the Most of a Situation Contour Lines Advanced Optimization <p>Unit vocabulary and notation: CME Text – page 625</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> Use inflection to form a straight line rather than using a path made of a series of segments. Maximize quantities rather than minimize them. Maximize the area under different restrictions on shape, perimeter and angles, and through this work, begin to explore isoperimetric problems. Find the maximum using reflection, experimentation and graphing. 	<p>Summative assessments:</p> <ul style="list-style-type: none"> Chapter Assessment Common Mid-year & Final Exams Regular (weekly) assessments/quizzes Performance tasks (semester/quarter) <p>Formative assessments:</p> <ul style="list-style-type: none"> Do Now Presentation of student work Student notebooks Facilitated student discourse Questioning (T>S, S>S) of randomly called students Open Response questions, writing prompts Probing for multiple representations Peer assessment Student-developed problems and solutions Exit ticket/poll question 	<p>CME Geometry Text</p> <p>LHS Math Website (includes resources for planning, instruction and assessment): https://sites.google.com/site/lawrencehsmath/</p> <p>CME Project website: http://cmeproject.edc.org</p> <p>Pearson Online text and resources: www.pearsonsuccessnet.com</p> <p>Common Core Standards of Mathematical Practice</p> <p>Illustrative Mathematics Project</p> <p>Common Core Standards of Mathematical Practice</p> <p>Problem solving strategy: <i>Noticing and Wondering</i></p> <p>For intervention and remediation: Khan Academy videos and assessments</p>