

**GHS Curriculum Map
Math
Grades 9-12**

Subject/Course Title: Geometry

Unit Title: Transformations & Coordinates ([Unit 1](#))

Unit Overview

This introductory unit builds on the background students bring to this course. Ideally students should have had considerable exposure to geometry in the Grade 8 Core Curriculum. In this course, students are expected to be familiar with the names of geometric figures, methods for computing area and perimeter, and some intuitive understanding of geometric transformations. Furthermore from their Algebra 1 course they will be familiar with the coordinate plane, equations of lines and the meaning of slope. Therefore, in this informal introduction to geometry we will focus on coordinate geometry and the representation of transformations in the coordinate plane. As students discover the properties of transformations they will establish the basis for a series of postulates that will become the foundation of the logical structure of geometry beginning in Unit 2.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
14 Blocks	<p><i>Standards for Math Practice</i></p> <p>2. Reason abstractly and quantitatively. 5. Use appropriate tools strategically.</p> <p><i>CT Core Standards</i></p> <p>G-CO.1 G-CO.2 G-CO.3. G-CO.4 G-CO.5 G-CO.6 G-GPE.7 8.G.6 8.G.7 8.G.8</p>	<ol style="list-style-type: none"> Why is it important to precisely define mathematical terms? Why are point, line and plane the undefined terms of geometry? How is coordinate geometry used to find distances and determine parallel and perpendicular lines? What is a transformation? What properties are preserved within various transformations? What properties are common to all isometries? 	<ul style="list-style-type: none"> Identifying similarities and differences Summarizing and note taking Reinforcing effort and providing recognition Homework and practice Nonlinguistic representations Cooperative learning Setting objectives and providing feedback Generating and testing hypotheses Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> Performance Task: Students will create a work of art using what they have learned about transformations. Writing: Math Journals Section quizzes Mid Unit test End of Unit test 	<p>Khan Academy</p> <p>Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> G-CO.1: 1-2, 1-3, 1-4, 1-6, 3-1, 10-6 G-CO.2: 9-1, 9-2, 9-3, 9-4, 9-6 G-CO.3: Concept Byte (CB) 9-3 G-CO.4: 9-1, 9-2, 9-3 G-CO.5: 9-1, 9-2, 9-3, 9-4 G-CO.6: 9-1, 9-2, 9-3, 9-4, 9-5 G-GPE.7: 6-7, 10-1 8.G (.6.7.8): 8-1, 1-7

Subject/Course Title: Geometry

Unit Title: Congruence, Constructions, & Proof ([Unit 2](#))

Unit Overview

In keeping with the CT Core Standards, the fundamental idea of congruence is defined in terms of transformations. The properties of transformations discovered in Unit 1 become postulates as students begin to construct a formal system of geometry.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
16 Blocks	<p><i>Standards for Math Practice</i> 3. Construct viable arguments and critique the reasoning of others. 5. Use appropriate tools strategically.</p> <p><i>CT Core Standards</i> G-CO.6 G-CO.7 G-CO.8 G-CO.9 G-CO.10 G-CO.12</p>	<ol style="list-style-type: none">1. How do equality and congruence differ?2. How can two triangles be proven congruent?3. What relationships hold among angles formed by parallel lines and a transversal?4. How can you construct geometric figures with a compass and straightedge?5. How can you create a viable argument that is supported by definitions, postulates and theorems?	<ul style="list-style-type: none">• Identifying similarities and differences• Summarizing and note taking• Reinforcing effort and providing recognition• Homework and practice• Nonlinguistic representations• Cooperative learning• Setting objectives and providing feedback• Generating and testing hypotheses• Questions, cues, and advance organizers.	<ul style="list-style-type: none">• Performance Task: Students will use a compass and straightedge to create geometric constructions.• Writing: Math Journals• Section quizzes• Mid Unit test• End of Unit test	<p>Khan Academy Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none">• G-CO.6: 9-1, 9-2, 9-3, 9-4, 9-5• G-CO.7: 9-5• G-CO.8: 9-5• G-CO.9: 2-6, 3-2, 5-2• G-CO.10: 3-5, 4-5, 5-1, 5-4• G-CO.12: 1-6, CB 3-2, 3-6, 4-4, CB 4-5, 5-2, CB 6-9, CB 7-5

Subject/Course Title: Geometry	Unit Title: Polygons (Unit 3)
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Unit Overview

An in-depth study of the properties of polygons provides students with the opportunity to construct a sequence of theorems based on the postulates and theorems introduced in unit 2. During this unit as they learn new facts about polygons, they should also hone their ability to understand and write proofs. Many of the properties studied will first be introduced through experimentation as students formulate conjectures. The teacher should continually emphasize that supporting a conjecture by evidence (inductive reasoning) does not constitute a proof (deductive reasoning).

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
14 Blocks	<p><i>Standards for Math Practice</i></p> <p>3. Construct viable arguments and critique the reasoning of others. 5. Use appropriate tools strategically.</p> <p><i>CT Core Standards</i></p> <p>G-CO.10 G-CO.11 G-CO.12 G-CO.13 G-GPE.4</p>	<ol style="list-style-type: none"> How are polygons classified? How can we prove properties of polygons? How are quadrilateral properties and their converses related to each other? How are geometric construction tools used to create or recreate geometric figures without measuring? How does coordinate proof differ from synthetic proof? 	<ul style="list-style-type: none"> Identifying similarities and differences Summarizing and note taking Reinforcing effort and providing recognition Homework and practice Nonlinguistic representations Cooperative learning Setting objectives and providing feedback Generating and testing hypotheses Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> Performance Task: Conjecture/Postulate Project. Writing: Math Journals Section quizzes Mid Unit test End of Unit test 	<p>Khan Academy</p> <p>Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> G-CO.10: 3-5, 4-5, 5-1, 5-4 G-CO.11: 6-2, 6-3, 6-4, 6-5 G-CO.12: 1-6, CB 3-2, 3-6, 4-4, CB 4-5, 5-2, CB 6-9, CB 7-5 G-CO.13: 3-6, 4-5, 10-3 G-GPE.4: 6-9

Subject/Course Title: Geometry

Unit Title: Similarity and Trigonometry ([Unit 4](#))

Unit Overview

This unit builds on students’ experiences with transformations and proving triangles congruent. Students continue to discover a pattern, make a conjecture, and then prove the theorem. This unit is also designed to help students to strengthen their understanding of proof. Students will use techniques learned in Unit 2 to prove triangles congruent to now prove triangles similar. These new theorems are then used to prove additional theorems. Right triangle trigonometry is then developed from similarity and used in the analysis of special right triangles and applications to real world problems.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
14 Blocks	<p><i>Standards for Math Practice</i></p> <p>2. Reason abstractly and quantitatively. 5. Use appropriate tools strategically. 7. Look for and make use of structure.</p> <p><i>CT Core Standards</i></p> <p>G-GPE.6 G-SRT.1.a G-SRT.1.b G-SRT.2 G-SRT.3 G-SRT.4 G-SRT.5 G-SRT.6 G-SRT.7 G-SRT.8</p>	<ol style="list-style-type: none"> How is the image under a dilation related to its pre-image? What defines similarity transformations? How is congruence a special case of similarity? How are the trigonometric ratios related to similarity? 	<ul style="list-style-type: none"> Identifying similarities and differences Summarizing and note taking Reinforcing effort and providing recognition Homework and practice Nonlinguistic representations Cooperative learning Setting objectives and providing feedback Generating and testing hypotheses Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> Performance Task: Students will use clinometers to measure angles and calculate measures indirectly. Writing: Math Journals Section quizzes Mid Unit test End of Unit test 	<p>Khan Academy</p> <p>Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> G-GPE.6: 1-3, 1-7 G-SRT.1.a: CB 9-6 G-SRT.1.b: CB 9-6 G-SRT.2: 9-7 G-SRT.3: 9-7 G-SRT.4: 7-5, 8-1 G-SRT.5: 4-2 thru 4-7, 5-1, 5-2, 5-4, 6-1 thru 6-6, 7-2, 7-3, 7-4 G-SRT.6: CB 8-3 G-SRT.7: 8-3 G-SRT.8: 8-1, 8-2, 8-3, 8-4

Subject/Course Title: Geometry

Unit Title: Circles and other Conics ([Unit 5](#))

Unit Overview

In this unit, a variety of methods, including formal synthetic proof, compass and straightedge constructions, and coordinate methods are applied to the study of circles and other conic sections.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
5 Blocks	<p><i>Standards for Math Practice</i> 3. Construct viable arguments and critique the reasoning of others. 5. Use appropriate tools strategically.</p> <p><i>CT Core Standards</i> G-CO.9 G-C.2 G-C.3 G-C.4. (+) G-C.5 G-GPE.1 G-GPE.2 G-GPE.3. (+) G-GPE.4</p>	<ol style="list-style-type: none"> How are the equations of conic sections related to their locus definitions? What relations among angles, chords, and tangents to circles can be proved? How are the lengths of arcs, areas of sectors, and radian measure related to central angles in circles? What are the properties of inscribed and circumscribed triangles and inscribed quadrilaterals? 	<ul style="list-style-type: none"> Identifying similarities and differences Summarizing and note taking Reinforcing effort and providing recognition Homework and practice Nonlinguistic representations Cooperative learning Setting objectives and providing feedback Generating and testing hypotheses Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> Writing: Math Journals Section quizzes Mid Unit test End of Unit test 	<p>Khan Academy Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> G-CO.9: 2-6, 3-2, 5-2 G-C.2: 10-6, CB 10-6, 12-2, 12-3 G-C.3: 5-3, 12-3 G-C.4 (+): 12-3 G-C.5: 10-6, 10-7 G-GPE.1: 12-5 G-GPE.2: CB 12-5 G-GPE.3 (+), G-GPE.4: 6-9

Subject/Course Title: Geometry

Unit Title: Three-Dimensional Geometry ([Unit 6](#))

Unit Overview

This unit provides an in-depth study of the vocabulary, properties and formulas for the surface area and volumes of polyhedra and other solid figures. Students make informal arguments for the formulas for surface area and volume. Later in the unit students study Cavalieri’s principle and encounter more formal derivations of the formulas for volume of the pyramid, cone and sphere. The unit explores several real world applications of surface area and volume as well as the geometry of the sphere.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
5 Blocks	<p><i>Standards for Math Practice</i></p> <p>1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 4. Model with mathematics.</p> <p><i>CT Core Standards</i></p> <p>6.G.4 7.G.6 8.G.9 G-GMD.1. G-GMD.2 (+) G-GMD.3 G-GMD.4 G-MG.1 G-MG.2 G-MG.3</p>	<ol style="list-style-type: none"> (Compare and contrast solid figures); what similarities exist that lead to grouping solids in categories? How do we create formulas when calculating surface area and volume of solids? Where do the formulas derive from and why is it beneficial to have a single formula for each type? How can we use these formulas to solve problems we might face in the real world? 	<ul style="list-style-type: none"> Identifying similarities and differences Summarizing and note taking Reinforcing effort and providing recognition Homework and practice Nonlinguistic representations Cooperative learning Setting objectives and providing feedback Generating and testing hypotheses Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> Performance Task: Students will discover similarities in the volume formulas for 3-D shapes and identify 3 generalized formulas that fit them all. Writing: Math Journals Section quizzes Mid Unit test End of Unit test 	<p>Khan Academy</p> <p>Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> 6.G.4: 1-1, 11-2, 11-3 7.G.6: 11-2, 11-3, 11-4, 11-5, 11-6, 11-7 8.G.9: 11-2, 11-3, 11-4, 11-5, 11-6, 11-7 G-GMD.1: CB 10-7, 11-4 G-GMD.2 (+): 11-4 G-GMD.3: 11-4, 11-5, 11-6 G-GMD.4: 11-1, 12-6 G-MG.1*: 8-3, 10-1, 10-2, 10-3, 11-2, 11-3, 11-4, 11-5, 11-6, 11-7 G.MG.2*: 11-7 G-MG.3*: 3-4

Subject/Course Title: Geometry	Unit Title: Applications of Probability (Unit 7)
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Unit Overview

This unit on probability builds on background students bring to this course. Ideally, students have had some experience with probability in the Grade 7 and 8 Core Curriculum. In practice, we realize that probability may be a new topic for many students and teachers. However, we expect students to understand that probability measures the likelihood that a chance event occurs.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
5 Blocks	<p><i>Standards for Math Practice</i></p> <p>1. Make sense of problems and persevere in solving them. 4. Model with mathematics. 7. Look for and make use of structure.</p> <p><i>CT Core Standards</i></p> <p>S-ID.5 S-CP.1 S-CP.2 S-CP.3 S-CP.4 S-CP.5 S-CP.6 S-CP.7</p>	<ol style="list-style-type: none"> 1. What distinguishes experimental from theoretical probability? 2. What is the basis of the formulas for calculating probabilities, including compound probability? 3. How are two-way frequency tables used to model real-life data? 4. How is expected value a valuable measure of data? 	<ul style="list-style-type: none"> • Identifying similarities and differences • Summarizing and note taking • Reinforcing effort and providing recognition • Homework and practice • Nonlinguistic representations • Cooperative learning • Setting objectives and providing feedback • Generating and testing hypotheses • Questions, cues, and advance organizers. 	<ul style="list-style-type: none"> • Writing: Math Journals • Section quizzes • Mid Unit test • End of Unit test 	<p>Khan Academy</p> <p>Textbook: <i>Geometry: Common Core</i> (Pearson Copyright 2012) Sections</p> <ul style="list-style-type: none"> • S-ID.5: 13.2 • S-CP.1: 13.1 • S-CP.2: 13.6 • S-CP.3: 13.6 • S-CP.4: 13.1, 13.2, 13.5 • S-CP.5: 13.2, 13.6 • S-CP.6: 13.6 • S-CP.7: 13.4