Geometry Pacing Guide

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| Unit of Study | Time Frame | Activities | Formal Assessments | Standards |
| Unit 1:  Foundations for Geometry   * 1-1 Understanding Points, Lines, and Planes * 1-2 Measuring and Constructing Segments * 1-3 Measuring and Constructing Angles * 1-4 Pairs of Angles * 1-5 Using Formulas in Geometry * 1-5 Midpoint and Distance in the Coordinate Plane * 1-7 Transformations in the Coordinate Plane. | Three weeks – August to September  (tentative schedule) | * Lessons for Sections 1-1 – 1-7. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) * Getting to know GeoGebra Tech Lab (15 points) | * Quiz over Euclidean and Construction Tools – Sections 1-1 through 1-4 (50 points) * Unit Test over Euclidean and Construction Tools and Coordinate and Transformation tools (100 points) | |  |  | | --- | --- | | **Domain** | **Congruence** | | ***Cluster*** | ***Experiment with transformations in the plane*** | | **Standards** | 1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.  2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).  3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. |  |  | | --- | | 12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle* | |
| Unit 2:  Geometric Reasoning   * 2-1 Using Inductive Reasoning to make Conjectures * 2-2 Conditional Statements * 2-3 Using Deductive Reasoning to Verify Conjectures * 2-4 Biconditional Statements and Definitions * 2-5 Algebraic Proof * 2-6 Geometric Proof * 2-7 Flowchart and Paragraph Proofs | Three weeks – September  (tentative schedule) | * Lessons for Sections 2-1 – 2-7. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) | * Quiz over Inductive Reasoning – Sections 1-1 through 1-4 * Unit Test over Inductive and Deductive Reasoning and Mathematical Proof | |  |  | | --- | --- | | **Domain** | **Congruence** | | ***Cluster*** | ***Prove geometric theorems*** | | Standards | 9. Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.* | |
| Unit 3:  Parallel and Perpendicular Lines   * 3-1 Lines and Angles * 3-2 Angles Formed by Parallel Lines and Transversals * 3-3 Proving Lines Parallel * 3-4 Perpendicular Lines * 3-5 Slopes of Lines * 3-6 Lines in the Coordinate Plane | Three weeks October (tentative schedule) | * Lessons for Sections 3-1 – 3-6. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) * 2 Technology Labs for Sections 3-2 and 3-6 using iPads (15 points each) | * Quiz over 3-1 – 3-4 Lines with Transversals * Unit Test over Lines with Transversals and Coordinate Geometry 3-1 – 3-6 | |  |  | | --- | --- | | **Domain** | **Congruence** | | ***Cluster*** | ***Prove geometric theorems*** | | Standards | 9. Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.* | |
| Unit 4:  Triangle Congruence   * 4-1 Classifying Triangles * 4-2 Angle Relationships in Triangles * 4-3 Congruent Triangles * 4-4 Triangle Congruence: SSS and SAS * 4-5 Triangle Congruence: ASA, AAS and HL * 4-6 Triangle Congruence: CPCTC * 4-7 Introduction to Coordinate Proof * 4-8 Isosceles and Equilateral Triangles | Three weeks October – November  (tentative schedule) | * Lessons for Sections 4-1 – 4-8. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it)   Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) | * Quiz over Triangles and Congruence – Sections 4-1 – 4-3 (50 points) * Unit Test over Triangles and Congruence and Proving Triangle Congruence (100 points) | |  |  | | --- | --- | | **Domain** | **Congruence** | | ***Cluster*** | ***Understand congruence in terms of rigid motions*** | | **Standards** | 6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.  7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.  8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. |  |  | | --- | | 10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.* | |
| Unit 5:  Properties and Attributes of Triangles   * 5-1 Perpendicular and Angle Bisectors * 5-2 Bisectors of Triangles * 5-3 Medians and Altitudes of Triangles * 5-4 The Triangle Midsegment Theorem * 5-5 Indirect Proof and Inequalities in One Triangle * 5-6 Inequalities in Two Triangles * 5-7 The Pythagorean Theorem * 5-8 Applying Special Right Triangles | Three weeks  End of November to December  (tentative schedule) | * Lessons for Sections 5-1 – 5-8. These include Guided notes and guided practice. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) * Technology Labs (15 points each) | * Quiz over Segments in Triangles – Sections 5-1 – 5-4. (50 points) * Unit Test over Segments and Relationships in Triangles. (100 points) | |  |  | | --- | --- | | **Domain** | **Similarity, Right Triangle, and Trigonometry** | | ***Cluster*** | ***Prove theorems involving similarity*** | | **Standards** | 4. Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*  5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. |  |  | | --- | | 10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.* | |
| Unit 6: Polygons and Quadrilaterals   * 6-1 Properties and Attributes of Polygons * 6-2 Properties of Parallelograms * 6-3 Conditions for parallelograms * 6-4 Properties of Special Parallelograms * 6-5 Conditions for Special Parallelograms * 6-6 Properties of Kites and Trapezoids. | Three weeks January  (tentative schedule) | * Lessons for Sections 6-1 – 6-6. These include Guided notes and guided practice. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) * Technology Labs (15 points each) | * Quiz over Polygons and Parallelograms – sections 6-1 – 6-3 (50 points) * Test over Polygons and Quadrilaterals (100 points) | |  |  | | --- | --- | | **Domain** | **Congruence** | | ***Cluster*** | ***Experiment with transformations in the plane*** | | **Standards** | |  |  | | --- | | 3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.  4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. |  |  | | --- | | 6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. |  |  | | --- | | 11. Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.* | |
| Unit 7: Similarity   * 7-1 Ratio and Proportion * 7-2 Ratios in Similar Polygons * 7-3 Triangle Similarity: AA, SSS and SAS * 7-4 Applying Properties of Similar Triangles * 7-5 Using Proportional Relationships * 7-6 Dilations and Similarity in the Coordinate Plane. | Three weeks  End of January to February  (tentative schedule) | * Lessons for Sections 7-1 – 7-6. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) * Technology Labs (15 points each) | * Quiz over Similarity Relationships (50 points) * Test over Similarity relationships and Applying Similarity (100 points) | |  |  | | --- | --- | | **Domain** | **Similarity, Right Triangles, and Trigonometry** | | ***Cluster*** | ***Understand similarity in terms of similarity transformations*** | | **Standards** | 1. Verify experimentally 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.  2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.  3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar |  |  |  | | --- | --- | | ***Cluster*** | ***Prove theorems involving similarity*** | | **Standards** | |  |  |  | | --- | --- | | 4. Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*  5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.   |  | | --- | | 6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. | | |
| Unit 8: Right Triangles and Trigonometry   * 8-1 Similarity in Right Triangles * 8-2 Trigonometric Ratios * 8-3 Solving Right Triangles * 8-4 Angles of Elevation and Depression * 8-5 Law of Sines and Law of Cosines * 8-6 Vectors | Three weeks February to March (tentative schedule) | * Lessons for Sections 8-1 – 8-6. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) | * Quiz over Trigonometric Ratios (50 points) * Unit Test over Trigonometric Ratios and applications (100 points) | |  |  | | --- | --- | | **Domain** | **Similarity, Right Triangles, and Trigonometry** | | ***Cluster*** | ***Define trigonometric ratios and solve problems involving right triangles*** | | **Standards**   |  | | --- | | 6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.  7. Explain and use the relationship between the sine and cosine of complementary angles.  8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. | | |  |  | | --- | | 9. (+) Derive the formula *A* = 1/2 *ab* sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.  10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.  11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). | |
| Unit 11: Circles   * 11-1 Lines and Arcs in Circles * 11-2 Arcs and Chords * 11-3 Sector Area and Arc Length * 11-4 Inscribed Angles * 11-5 Angle Relationships in Circles * 11-6 Segment Relationships in Circles * 11-7 Circles in the Coordinate Plane | Three Weeks  March to April (tentative schedule) | * Lessons for Sections 11-1 – 11-7. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) | * Quiz over Lines and Arcs in Circles (50 points) * Test over Lines and Arcs in Circles and Angles and Segments in Circles (100 points) | |  |  | | --- | --- | | **Domain** | ***Circles*** | | ***Cluster*** | ***Understand and apply theorems about circles*** | | **Standards** | 1. Prove that all circles are similar.  2. Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.* |  |  |  | | --- | --- | | ***Cluster*** | ***Find arc lengths and areas of sectors of circles*** | | **Standards** | 5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. |  |  |  | | --- | --- | | ***Cluster*** | ***Translate between the geometric description and the equation for a conic section*** | | **Standards** | 1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. | |
| Unit 10:  Spatial Reasoning   * 10-1 Solid Geometry * 10-2 Representations of Three-Dimensional Figures * 10-3 Formulas in Three Dimensions * 10-4 Surface Area of Prisms and Cylinders * 10-5 Surface Area of Pyramids and Cones * 10-6 Volume of Prisms and Cones * 10-7 Volume of Pyramids and Cones * 10-8 Shperes | Three weeks April to May (tentative Schedule) | * Lessons for Sections 8-1 – 8-6. These include Guided notes which are checked for completion at each assessment time through a binder check. * Assignments for each lesson worth 10 points each. * Review Packet for Quiz. (20 points – 10 points per day spent on it) * Review Packet for Test (20 points – 10 per day spent on it) * Binder checks – Students keep a binder with sections for notes, assignments, technology labs, quizzes and tests. (25 points each check – done at assessment times) | * Quiz over Three Dimensional Figures (50 points) * Test over Three-Dimensional Figures and Surface Area and Volume (100 points) | |  |  | | --- | --- | | **Domain** | **Geometric Measurement and Dimension** | | ***Cluster*** | ***Explain volume formulas and use them to solve problems*** | | **Standards** | 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. *Use dissection arguments, Cavalieri’s principle, and informal limit arguments*   |  | | --- | | 3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. | |  |  |  | | --- | --- | | **Domain** | **Modeling with Geometry** | | ***Cluster*** | ***Apply geometric concepts in modeling situations*** | | **Standards** | 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).  2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). | |