**Niagara Falls High School – Geometry (10 Week Marking Period)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **CO.1   Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**  |   -use geometric symbols and notation to name points, lines, and segments | **1-1 Points, Lines, and Segments (EM) (1 day)** | Point, line, line segment, plane, collinear,  |  |
| **CO.1 Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**  **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.**  |   -use compass | **1-2 Circles and Arcs (EM) (1 day)**  |  circle, equidistant, radius, diameter, arc, intersection | <https://www.mathopenref.com/constcirclecenter.html>  |
| **CO.1 Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**  |   -use and read protractor -draw a ray -draw an angle -name angles using 3 letters | **1-3 Rays and Angles (EM) (1 day)** |  ray, angle, vertex, degree | <https://www.youtube.com/watch?v=oeO8f0taQDA>  |
| **Foundational**  |  -review types of angles   | **1-4 Types of Angles (EM) (1day)**  |  acute, right, obtuse, straight, reflex |    |
| **Foundational**  |   -2 angles that add up to 90° are complementary. -2 angles that add up to 180° are supplementary. - find missing angle algebraically given a complementary/supplementary pair. | **1-5 Pairs of Angles (EM) (1day)**  |  adjacent, supplementary, complementary, overlapping |   <https://www.youtube.com/watch?v=JPjQaELCdC0>  |
| **CO.1 Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**   |   - linear pairs = 180° - vertical angles are = -find missing angle algebraically given a linear pair or vertical angles | **1-6 More Pairs of Angles (EM) (1day)**  |  congruent, linear pair, vertical, |    |
| **CO.1 Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**  |   -determine angle bisector using a protractor and know resulting angles are congruent. -using angle measures determine perpendicularity (introduce symbol)  | **1-7 Angle Bisectors and Perpendicular Lines (EM) (1 day)**  |  bisector, perpendicular |   <https://www.youtube.com/watch?v=X4p9dXSIEpU>  |
| **CO.1 Know precise definitions of angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc as these exist within a plane.**   |   -find the midpoint of a line segment - midpoint divides segment into congruent segments -draw perpendicular bisector using a ruler and protractor. | **1-8 Additional Geometric Terminology (EM) (1day)**  |  midpoint, segment bisector, perpendicular bisector, kite |    |
| **Foundational**  |  -determine which polygons have parallel sides. - determine angle measures algebraically given 2 parallel lines cut by a transversal.  -parallel line postulate | **1-9 Parallel Lines (EM) (1day)** |  parallel, polygons, transversal, corresponding angles, alternate interior angles, alternate exterior angles, same-side interior, same-side exterior |    |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |  -use compass and straight edge to copy a triangle -determine triangles congruent using SSS | **1-10 Copying a Triangle (EM) (1 day)**  |   |   <https://www.mathopenref.com/constcopytriangle.html>  |
| **GPE.5 On the coordinate plane:** **a. Explore the proof for the relationship between slopes of parallel and** **perpendicular lines;** **b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |  -graph polygons in the coordinate plane | **1-11 Geometry in the Coordinate Plane (EM) (1day)**  |  coordinate plane, quadrilateral,  |    |
| **Unit 1 Assessment (2 Days)**   | **Unit 1 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **15 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content**   |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.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.** **CO.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.**  |   -given a function rule, transform a figure -a translation is a rigid motion - rigid motions preserve size and shape -introduce prime notation for an image | **2-1 Transformations**  |  function, image, pre-image, rigid motion, input, output, converts, maps, transformation, translation, prime  |   |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.**  |   -a rotation is a rigid motion -rotate a figure clockwise and counterclockwise. -rotate figures to find the coordinates of its image | **2-2 Rotations – Day 1**  |  rotation, rigid motions, clockwise, counterclockwise, prime |   <https://calcworkshop.com/transformations/rotation-rules/>  |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.** **CO.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.**  |   -discover rotations preserve distance and angle measures -preform rotations on the coordinate plane | **2-3 Rotations – Day 2**  |   |    |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.12 Make, justify, and apply formal geometric constructions.**  |   - reflection is a rotation of 180° -discover a function rule for a reflection over the origin | **2-4 Point Reflections**  |  reflection, |  <https://www.khanacademy.org/math/geometry/hs-geo-transformations/hs-geo-reflections/v/reflecting-points>  |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.**  |   -rule for a reflection over the x-axis - rule for a reflection over the y-axis  -reflect a figure over a given line in the coordinate plane - reflection is a rigid motion | **2-5 Line Reflections**  |  reflection, mapped, vertices, image, prime, double prime, rigid motion |    |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.**  |   -translate figure on and off the coordinate plane - create a function rule for a given translation | **2-8 Translations**  |  translation, vector, translate, map, prime, double prime, rotation, reflection |   |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.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.** **CO.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.** **CO.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.**  |   -show figures are congruent by a sequence of rigid motions - perform a sequence of rigid motions on the coordinate plane | **2-9 Congruence and Rigid Motions**  |  rigid motion, sequence, corresponding sides, corresponding angles, congruent figures, auxiliary line, |  <https://www.jmap.org/Worksheets/G.CO.A.5.CompositionsofTransformations1.pdf>  |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.3 Given a regular or irregular polygon, describe the rotations and reflections(symmetries) that carry the polygon onto itself.** **CO.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.** **CO.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.**  |  -find lines of symmetry of polygons | **2-10 Symmetry**  |  symmetry, regular polygon, equilateral, rotational symmetry |    |
| **Unit 2 Assessment (2 Days)**   | **Unit 2 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **12 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **CO.10 Prove and apply theorems about triangles.**   |   -Use the triangle inequality theorem  | **3-1 The Triangle Inequality Theorem**  |  collinear, |   <https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-geometry/cc-7th-constructing-geometric-shapes/v/triangle-inqequality-theorem> <https://teacher.desmos.com/activitybuilder/custom/59b96baa174ded09890f34c7>  |
| **CO.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.** **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**   |   -Corresponding parts of congruent triangles are congruent | **3-2 Congruent Triangles**  |  congruent, rigid motions, perpendicular bisector, congruence statement, corresponding, CPCTC, equidistant  |   |
| **Foundational**  |   -making inferences from given statements - | **3-3 Drawing Inferences from Geometric Givens**  |  median, midpoint, altitude, opposite side |   |
| **CO.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.** **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.** **CO.10 Prove and apply theorems about triangles.**  |   -use SSS theorem to prove triangles are congruent -introduce hatch (hash) marks to show congruent sides -introduce 2 column proof | **3-4 The Side-Side-Side Theorem**  |  triangle congruence |   <https://jmap.org/Worksheets/G.SRT.B.5.TriangleCongruency.pdf> <https://www.jmap.org/Worksheets/G.SRT.B.5.TriangleProofs1.pdf> |
| **CO.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.** **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.** **CO.9 Prove and apply theorems about lines and angles.**  |   -Use SAS to prove triangles congruent - Use CPCTC | **3-5 The Side-Angle-Side Theorem**  |  midpoint, collinear, bisect, corresponding, |   <https://jmap.org/Worksheets/G.SRT.B.5.TriangleCongruency.pdf>  <https://www.jmap.org/Worksheets/G.SRT.B.5.TriangleProofs1.pdf> |
| **CO.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.** **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.**  |   -Use ASA to prove triangles congruent -Use CPCTC | **3-6 The Angle-Side-Angle Theorem**  |  reflexive, isosceles |   <https://jmap.org/Worksheets/G.SRT.B.5.TriangleCongruency.pdf>  <https://www.jmap.org/Worksheets/G.SRT.B.5.TriangleProofs1.pdf> |
| **CO.9 Prove and apply theorems about lines and angles.**  |   -the whole is equal to the sum of its parts -properties of equality | **3-7 The Properties of Equality**  |  partition, addition property of equality, subtraction property of equality |    |
| **CO.9 Prove and apply theorems about lines and angles.** **CO.10 Prove and apply theorems about triangles.**  |  -Revisit parallel lines cut by a transversal angle relationships - The sum of all 3 angles in a triangle is 180° | **3-9 Parallel Lines and Proof**  |  supplementary, congruent |   <https://www.bigideasmath.com/external/state-resources/pdfs/NC_math2_06_03.pdf>  |
| **CO.9 Prove and apply theorems about lines and angles.** **CO.10 Prove and apply theorems about triangles.**  |  -exterior angle of triangle is equal to the sum of the 2 remote interior angles -exterior angle of a triangle will be greater than either of its 2 interior angles | **3-10 Exterior Angles**  |  interior, exterior, adjacent, non-adjacent, remote interior |   |
| **CO.9 Prove and apply theorems about lines and angles.**  |  -Use congruent angles formed by parallel lines cut by transversal to prove parallel lines. | **3-11 Proving Lines are Parallel**  |  alternate interior, corresponding, parallel, justify |   |
| **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.** **CO.10 Prove and apply theorems about triangles.**  |  -Use AAS to prove triangles congruent -learn properties of isosceles triangles | **3-12 AAS and Isosceles Triangles**  |  isosceles triangle, base angles, opposite sides |   <https://jmap.org/Worksheets/G.SRT.B.5.TriangleCongruency.pdf> <https://www.jmap.org/Worksheets/G.SRT.B.5.TriangleProofs1.pdf> |
| **CO.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.** **CO.8 Explain how the criteria for triangle congruence (ASA, SAS, SSS, AAS and HL (Hypotenuse Leg)) follow from the definition of congruence in terms of rigid motions.** **CO.9 Prove and apply theorems about lines and angles.**  |  -Use HL to prove right triangles are congruent  | **3-13 The Hypotenuse-Leg Theorem**  |  hypotenuse, leg, right triangle, perpendicular  |   <https://jmap.org/Worksheets/G.SRT.B.5.TriangleCongruency.pdf> <https://www.jmap.org/Worksheets/G.SRT.B.5.TriangleProofs1.pdf> |
| **Foundational**  |  - Use SSS, ASA, AAS, SAS, HL to prove triangles congruent -Use CPCTC to prove other parts congruent -prove lines are parallel | **3-14 Additional Triangle Proof (Honors Only)**  |   |   <https://www.jmap.org/~jmaporg/Worksheets/G.SRT.B.5.TriangleProofs2.pdf>  |
| **Unit 3 Assessment (2 Days)**   | **Unit 3 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **19 Total Days (with 4 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

**Niagara Falls High School – Geometry (20 Week Marking Period)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content**   |
| **GPE.5 On the coordinate plane:** **a. Explore the proof for the relationship between slopes of parallel and perpendicular lines;** **b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |   -Use slope formula to find the slope of line segments -find the slope of a line given 2 points -realize that parallel lines have equal slopes | **5-1 Slope and Parallel Lines**  |  slope, non-vertical, change in y, change in x |   <https://jmap.org/Worksheets/G.GPE.B.5.ParallelandPerpendicularLines2.pdf>  |
| **GPE.5 On the coordinate plane:** **a. Explore the proof for the relationship between slopes of parallel and perpendicular lines;** **b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |   -find slopes of lines and determine if they are perpendicular - realize perpendicular lines have negative reciprocal slopes. | **5-2 Slope and Perpendicular Lines**  |  perpendicular, reciprocal, negative reciprocal |   <https://jmap.org/Worksheets/G.GPE.B.5.ParallelandPerpendicularLines2.pdf>  |
| **GPE.5 On the coordinate plane:** **a. Explore the proof for the relationship between slopes of parallel and perpendicular lines;** **b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |   -Use slope-intercept form to identify slope, y-intercept, graph the line - rearrange equations into slope-intercept form | **5-3 The Slope-Intercept Form of a Line**  |  slope-intercept, y intercept, parallel, perpendicular |   |
| **GPE.5 On the coordinate plane:** **a. Explore the proof for the relationship between slopes of parallel and perpendicular lines;** **b. Determine if lines are parallel, perpendicular, or neither, based on their slopes; and** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |   -write equations in point-slope form -discuss advantages of slope-intercept and point-slope forms | **5-4 The Point-Slope Form of a Line**  |  point-slope form |   |
| **CO.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.**  |   -graph vertical and horizontal lines - write equations for vertical and horizontal lines | **5-5 Horizontal and Vertical Lines**  |  horizontal, vertical, |   |
| **CO.10 Prove and apply theorems about triangles.** **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   -use the Pythagorean theorem to find the missing side of a right triangle | **5-6 The Pythagorean Theorem**  |  legs, hypothenuse, right triangle, Pythagorean triple, perfect squares, square root, non-perfect squares, irrational, rational, radical form  |   <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-geometry/cc-8th-pythagorean-theorem/v/the-pythagorean-theorem> <https://www.youtube.com/watch?v=RGh8n86EE48> <https://www.youtube.com/watch?v=KnEgt5V2H1U>  |
| **GPE.4 On the coordinate plane, algebraically prove geometric theorems and properties.** **GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.**  |   -use the distance formula to find the length of a segment | **5-7 The Distance Formula**  |   |   [https://www.khanacademy.org/math/in-in-grade-10-ncert/x573d8ce20721c073:coordinate-geometry/x573d8ce20721c073:distance-formula/v/example-finding-distance-with-pythagorean-theorem](https://www.khanacademy.org/math/in-in-grade-10-ncert/x573d8ce20721c073%3Acoordinate-geometry/x573d8ce20721c073%3Adistance-formula/v/example-finding-distance-with-pythagorean-theorem) [https://www.khanacademy.org/math/in-in-grade-10-ncert/x573d8ce20721c073:coordinate-geometry/x573d8ce20721c073:distance-formula/v/distance-formula](https://www.khanacademy.org/math/in-in-grade-10-ncert/x573d8ce20721c073%3Acoordinate-geometry/x573d8ce20721c073%3Adistance-formula/v/distance-formula)  |
| **GPE.4 On the coordinate plane, algebraically prove geometric theorems and properties.** **GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.**  |  -find the midpoint of a segment | **5-8 The Midpoint Formula**  |  average, mean, midpoint |   <https://www.khanacademy.org/math/geometry/hs-geo-analytic-geometry/hs-geo-distance-and-midpoints/v/midpoint-formula>  |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.**  |  -rotate figures on the coordinate plane. - determine general rotation rules | **5-9 Rotations in the Coordinate Plane**  |  rotate, rigid motions, relative position, origin |   |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.**  |  -reflect figures over a given reflection line on the coordinate plane | **5-10 Reflections in the Coordinate Plane**  |  reflect, rigid motion,  |  <https://www.khanacademy.org/math/geometry/hs-geo-transformations/hs-geo-reflections/v/reflecting-shapes> |
| **CO.2 Represent transformations as geometric functions that take points in the plane as inputs and give points as outputs. Compare transformations that preserve distance and angle measure to those that do not.** **CO.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.** **CO.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.** **CO.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.**  |  -preform a sequence of rigid motions on the coordinate plane | **5-11 Sequences in Rigid Motions**  |  sequence, rigid motion |   <https://www.jmap.org/Worksheets/G.CO.A.5.CompositionsofTransformations1.pdf> |
| **Unit 5 Assessment (2 Days)**   | **Unit 5 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **17 Total Days (with 4 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **GPE.4 On the coordinate plane, algebraically prove geometric theorems and properties.**   |   -find missing angle in a quadrilateral  | **6-1 Quadrilaterals**  |  quadrilateral, concave, convex, interior angles, sum, diagonal |   |
| **CO.11 Prove and apply theorems about parallelograms.**  |   -properties of special quadrilaterals  | **6-2 Special Quadrilaterals**  |  trapezoid, parallelogram, rectangle, rhombus, square |   <https://www.nysmathregentsprep.com/uploads/6/2/3/2/62326735/lesson_1_-_properties_of_quadrilaterals_answers.pdf>  |
| **CO.11 Prove and apply theorems about parallelograms.**  |   -learn all properties of parallelograms | **6-3 Parallelograms**  |  opposite sides, opposite angles, diagonal, parallel, bisect, midpoint |   <https://swrfroelich.weebly.com/uploads/2/3/0/3/23036734/4.4_proofs_with_parallelograms_practice.pdf>  |
| **CO.11 Prove and apply theorems about parallelograms.**  |   -prove properties of parallelograms | **6-4 Parallelograms**  |   |   <https://swrfroelich.weebly.com/uploads/2/3/0/3/23036734/4.4_proofs_with_parallelograms_practice.pdf>  |
| **CO.10 Prove and apply theorems about triangles.**  |   -Use midpoint segment theorem | **6-5 The Midpoints of a Triangle**  |  midpoint segment theorem,  |   <https://byjus.com/maths/mid-point-theorem/>  |
| **CO.11 Prove and apply theorems about parallelograms.**  |   -use properties of rectangles to prove a quadrilateral is a rectangle | **6-6 Rectangles**  |  rectangle |   |
| **CO.11 Prove and apply theorems about parallelograms.**  |   - use properties of rhombus to prove quadrilaterals are rhombi  | **6-7 Rhombuses**  |  rhombus, vertex angle, perpendicular |   <https://jmap.org/Worksheets/G.CO.C.11.SpecialQuadrilaterals1a.pdf>  |
| **CO.11 Prove and apply theorems about parallelograms.**  |  -use properties of squares to prove a quadrilateral is a square | **6-8 Squares**  |  square |   |
| **CO.11 Prove and apply theorems about parallelograms.**  |  -Use properties of isosceles trapezoids to solve problems | **6-9 Isosceles Trapezoids**  |  isosceles trapezoid, base angles |   <https://jmap.org/Worksheets/G.GPE.B.4.QuadrilateralsintheCoordinatePlane2.pdf>  |
| **CO.3 Given a regular or irregular polygon, describe the rotations and reflections(symmetries) that carry the polygon onto itself.**   |  -determine the symmetry in geometric figures | **6-10 The Symmetries of Quadrilaterals**  |  rigid motion, symmetry, |   <https://www.jmap.org/Worksheets/G.CO.C.11.QuadrilateralProofs.pdf>  |
| **Unit 6 Assessment (2 Days)**   | **Unit 6 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **14 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.** **Coherence: NY-8.G.3 → GEO-G.SRT.1** **a. Verify experimentally that 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. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.**   |   -dilate a figure given a scale factor - determine the scale factor given a figure and its image  | **7-1 Dilations**  |  dilation, scale factor, preserve, image |   <https://www.khanacademy.org/math/geometry-home/transformations/dilations-scaling/v/dilating-from-an-arbitrary-point-example> <https://www.khanacademy.org/math/geometry/hs-geo-transformations/hs-geo-dilations/v/dilation-scale-factor>  |
| **SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.** **Coherence: NY-8.G.3 → GEO-G.SRT.1** **a. Verify experimentally that 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. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.**  |   - dilate lines and figures on the coordinate plane | **7-2 Dilations in the Coordinate Plane**  |   |   <https://downstairsmath.weebly.com/uploads/3/7/1/8/37189031/g.srt.a.1.linedilations.pdf>  |
| **SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.** **Coherence: NY-8.G.3 → GEO-G.SRT.1** **a. Verify experimentally that 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. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**  |   -dilate figures and verify angles remain the same | **7-3 Dilations and Angles**  |   |   <https://jmap.org/Worksheets/G.SRT.A.2.Dilations1.pdf>  |
| **SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.** **Coherence: NY-8.G.3 → GEO-G.SRT.1** **a. Verify experimentally that 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. Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor.** **SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar. Explain using similarity transformations that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.**  |   - use proportional reasoning to determine similarity  | **7-4 Similar Figures**  |  similar figures, corresponding, proportional,  |   <https://jmap.org/Worksheets/G.SRT.B.5.Similarity1.pdf>  |
| **SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar. Explain using similarity transformations that similar triangles have equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.** **SRT.3 Use the properties of similarity transformations to establish the AA~, SSS~, and SAS~ criterion for two triangles to be similar.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**  |   -determine similarity by AA -use proportions to prove triangles are similar  | **7-5 Similarity Criteria**  |  criteria,  |   <https://jmap.org/Worksheets/G.SRT.B.5.Similarity1.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**  |   - prove triangles are similar  | **7-6 Reasoning with Similarity**  |   |   <https://jmap.org/Worksheets/G.SRT.A.3.SimilarityProofs.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.**   |   -prove triangle are similar  | **7-7 More Similarity and Reasoning**  |  product, means, extremes,  |   <https://jmap.org/Worksheets/G.SRT.A.3.SimilarityProofs.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**  |  -use side splitter theorem | **7-8 The Side Splitter Theorem**  |  proportional, parallel, converse |   <https://www.jmap.org/Worksheets/G.SRT.B.5.SideSplitterTheorem1a.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.** **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures** **SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.**  |  -partition a line segment given a ratio | **7-9 Partitioning a Line Segment**  |  partition, ratio, |  <https://jmap.org/Worksheets/G.GPE.B.6.DirectedLineSegments1a.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.**  |  - find the centroid of a triangle | **7-10 The Medians of a Triangle**  |  median of a triangle, point of concurrency, centroid, vertex, midpoint |   <https://www.jmap.org/Worksheets/G.CO.C.10.CentroidOrthocenterIncenterandCircumcenter.pdf>  |
| **SRT.4 Prove and apply similarity theorems about triangles.**  |   | **7-12 Geometric Means**  |   |   |
| **Unit 7 Assessment (2 Days)**   | **Unit 7 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **15 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

**Niagara Falls High School – Geometry (30 Week Marking Period)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content**   |
| **SRT.5 Use congruence and similarity criteria for triangles to:** **a. Solve problems algebraically and geometrically.** **b. Prove relationships in geometric figures**  |   -Given similar right triangles use ratios/proportions to find the missing side of a right triangle | **8-1 Similar Right Triangles**  |  relatively positioned sides,  |   <https://www.jmap.org/Worksheets/G.SRT.B.5.Similarity4.pdf>  |
| **SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.** **SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.**  **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   -use SOA-CAH-TOA to find ratios | **8-2 The Trigonometric Ratios**  |  sine, cosine, tangent, opposite, adjacent, hypothenuse, trigonometric ratio |  [Which Side? (transum.org)](https://www.transum.org/software/Online_Exercise/Transumometry/WhichSide/?classId=0255e0cf-226c-4f3e-801e-b20f0cb25b6e&assignmentId=56e518d4-b369-4ee9-b2d6-f71782abf6d0)<https://jmap.org/Worksheets/G.SRT.C.6.TrigonometricRatios1a.pdf>  |
| **SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of sine, cosine and tangent ratios for acute angles.** **SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.** **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   -given a right triangle, use a trig ratio to a missing side - use inverse trig to find a missing angle in right triangle | **8-3 Trigonometry and the Calculator**  |  inverse sine, inverse cosine, inverse tangent |   <https://jmap.org/Worksheets/G.SRT.C.8.UsingTrigonometrytoFindanAngle2.pdf>  |
| **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   - set up and solve a proportion using trig ratios to find a missing side of a right triangle | **8-4 Solving for Missing Sides Using Trigonometry**  |   |   <https://www.jmap.org/Worksheets/G.SRT.C.8.UsingTrigonometrytoFindaSide1a.pdf>  |
| **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   -apply knowledge of trig to word problems | **8-5 Applying Right Triangle Trigonometry**  |  angle of elevation, angle of depression |   <https://www.jmap.org/Worksheets/G.SRT.C.8.UsingTrigonometrytoFindaSide4.pdf>  |
| **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.**  |   -apply knowledge of trig to word problems | **8-6 More Applications of Trigonometry**  |   |   <https://www.jmap.org/Worksheets/G.SRT.C.8.UsingTrigonometrytoFindaSide4.pdf>  |
| **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.** **SRT.9** Justify and apply the formula A= 12ab sin (C) to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.  |   -find area of a triangle | **8-7 The Area Formula of a Triangle**  |  area, altitude, |   |
| **SRT.8 Use sine, cosine, tangent, the Pythagorean Theorem and properties of special right triangles to solve right triangles in applied problems.** **SRT.9** Justify and apply the formula A= 12ab sin (C) to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.  |  -45-45 right triangle-30-60 right triangle | **8-8 The Special Right Triangles**  |  isosceles, equilateral  |   <https://www.khanacademy.org/math/geometry-home/right-triangles-topic/special-right-triangles/v/45-45-90-triangles> <https://www.khanacademy.org/math/geometry-home/right-triangles-topic/special-right-triangles/v/intro-to-30-60-90-triangles>  |
| **Unit 8 Assessment (2 Days)**   | **Unit 8 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **12 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.**  |   -identify parts of a circle -use relationship between diameter and radius to find either -use central angle to find measure of its arc | **9-1 Circle Terminology**  |  circle, radius, chord, diameter, center, fixed distance, minor arc, major arc, central angle, intercept |   <https://www.nysmathregentsprep.com/uploads/6/2/3/2/62326735/temporary_-_circles_mini_lesson_answers.pdf>  |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.**  |   -use inscribed angle theorem to find the measure of its arc -use exterior angle theorem to find angle measures | **9-2 Inscribed Angles**  |  inscribed angle, intercepted arc, exterior |   |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.**  |   -find various measures for inscribed triangles | **9-3 More Work with Inscribed Angles**  |  semicircle, inscribed, cyclic quadrilaterals, |   |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.** **C.2b Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle.**  |   -use theorems of intersecting chords to find measures  | **9-4 Intersecting Chords**  |  chord, partitioned,  |   <https://www.jmap.org/Worksheets/G.C.A.2.ChordsSecantsandTangents1.pdf>  |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.** **C.2b Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle.**  |   -use tangent lines to find measures and angles | **9-5 Tangents to Circles**  |  tangent, point of tangency  |   <https://www.jmap.org/Worksheets/G.C.A.2.ChordsSecantsandTangents5.pdf>  |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.**   |   -use tangent and secant lines to find the measure of arcs and angles | **9-6 Tangents, Secants, and Their Angles**  |  secant, extension, difference, |   <https://www.jmap.org/Worksheets/G.C.A.2.ChordsSecantsandTangents7.pdf>  |
| **C.2a Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.**   |   -use tangent and secant lines in proofs  | **9-7 Tangent and Secant Proofs and Practice**  |   |   <https://www.jmap.org/Worksheets/G.SRT.B.5.CircleProofs.pdf>  |
| **C.2b Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle.**  |  -use secant and tangent theorems to find lengths | **9-8 Secant and Tangent Lengths**  |  product, square, external |   <https://www.jmap.org/Worksheets/G.C.A.2.ChordsSecantsandTangents8.pdf>  |
| **GPE.1a Derive the equation of a circle of given center and radius using the Pythagorean Theorem. Find the center and radius of a circle, given the equation of the circle.** **GPE.1b Graph circles given their equation.**  |  -write an equation of a circle given the center and radius -find the center and radius given an equation in standard form | **9-9 Equations of Circles**  |  center, origin, arbitrary point,  |   <https://www.jmap.org/Worksheets/G.GPE.A.1.EquationsofCircles1.pdf>  |
| **GPE.1a Derive the equation of a circle of given center and radius using the Pythagorean Theorem. Find the center and radius of a circle, given the equation of the circle.** **GPE.1b Graph circles given their equation.**  |  -putting an equation in standard form by completing the square | **9-10 Placing a Circle in Standard Form**  |  completing the square |   <https://www.jmap.org/Worksheets/G.GPE.A.1.EquationsofCircles2.pdf> <https://www.jmap.org/Worksheets/G.GPE.A.1.EquationsofCircles3.pdf>  |
| **C.4 Develop definitions of rotations, reflections, and translations in terms of points, angles, circles, perpendicular lines, parallel lines, and line segments.**  |  -construct a tangent line | **9-11 Constructing Tangents**  |   |   <https://www.mathopenref.com/consttangents.html> <https://www.mathopenref.com/consttangent.html>  |
| **C.2b Identify, describe and apply relationships among radii, chords, tangents, and secants of a circle.** **GPE.5c On the coordinate plane:** **c. Apply properties of parallel and perpendicular lines to solve geometric problems.**  |  -write the equation for a line tangent to a circle | **9-12 Equations of Tangent Lines**  |  slope, perpendicular, negative reciprocals, radius |   |
| **Unit 9 Assessment (2 Days)**   | **Unit 9 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **18 Total Days (with 4 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

**Niagara Falls High School – Geometry (40 Week Marking Period)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content** |
| **GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.**  |   -find the perimeter of polygons | **10-1 Perimeter**  |  perimeter, polygon, |   <https://jmap.org/Worksheets/G.MG.A.3.Perimeter.pdf>  |
| **SRT.9 Justify and apply the formula A= 12ab sin (C) to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.** **GMD.1**  |   -use the circumference formula to find the circumference of a circle | **10-2 The Circumference of a Circle**  |  circumference, radius, diameter |   <https://www.youtube.com/watch?v=_E0C5ECDS0U>  |
| **GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.** **SRT.9 Justify and apply the formula A= 12ab sin (C) to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.**  |   -find the area of polygons both on and off the coordinate plane | **10-3 The Areas of Polygons**  |  area, square units, 2-dimension, length, width, height |    |
| **GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.**  |   -find the area of dilated figures | **10-4 Areas of Similar Figures**  |  image, pre-image, scale factor |   <https://www.jmap.org/Worksheets/G.SRT.B.5.Similarity3.pdf>  |
| **SRT.9 Justify and apply the formula A= 12ab sin (C) to find the area of any triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.** **MG.1**  |   -find the area of circles using the formula | **10-5 The Area of a Circle**  |  radius, diameter |   <https://www.youtube.com/watch?v=YokKp3pwVFc>  |
| **C.5 Using proportionality, find one of the following given two others; the central angle, arc length, radius or area of sector.**  |   -find the area of a sector of a circle | **10-7 Sectors of a Circle**  |  sector, central angle, minor sector, proportion |   <https://www.jmap.org/Worksheets/G.C.B.5.Sectors.pdf>  |
| **GMD.4 Identify the shapes of plane sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two- dimensional objects.**  |   -determine the cross-section of a solid | **10-8 Solids and Their Cross Sections**  |  solid, right prism, cross-section, right circular cylinder, pyramid, cone |   <https://www.jmap.org/Worksheets/G.GMD.B.4.CrossSectionsofThreeDimensionalObjects.pdf>  |
| **GMD.1 Provide informal arguments for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.** **GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.** **MG.1 Use geometric shapes, their measures, and their properties to describe objects.** **MG.3 Apply geometric methods to solve design problems.**  |  -using the formulas, find the volume of prisms and cylinders-given the volume rearrange the formula to solve for another variable | **10-9 Volumes of Right Prisms and Cylinders**  |  volume, cubic units, dimension |   <https://www.jmap.org/Worksheets/G.GMD.A.3.Volume1.pdf> <https://www.jmap.org/Worksheets/G.GMD.A.3.Volume3.pdf>  |
| **GMD.1 Provide informal arguments for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.** **GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.** **MG.1 Use geometric shapes, their measures, and their properties to describe objects.** **MG.3 Apply geometric methods to solve design problems.**  |  -using the formulas, find the volume of pyramids and cones-given the volume, rearrange the formula to solve for another variable | **10-10 Volumes of Pyramids and Cones**  |   |   <https://www.jmap.org/Worksheets/G.GMD.A.3.Volume4.pdf> <https://www.jmap.org/Worksheets/G.GMD.A.3.Volume5.pdf>  |
| **GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.** **MG.1 Use geometric shapes, their measures, and their properties to describe objects.** **MG.3 Apply geometric methods to solve design problems.**  |  -use the formula to find the volume of a spere | **10-11 Spheres**  |   |   <https://www.jmap.org/Worksheets/G.GMD.A.3.Volume6.pdf>  |
| **MG.1 Use geometric shapes, their measures, and their properties to describe objects.** **MG.2 Apply concepts of density based on area and volume of geometric figures in modeling situations** **MG.3 Apply geometric methods to solve design problems.**  |  -find the density given tables, word problems or solids | **10-12 Density**  |  density, population density, mass density |   <https://www.jmap.org/Worksheets/G.MG.A.2.Density.pdf>  |
| **MG.1 Use geometric shapes, their measures, and their properties to describe objects.** **MG.2 Apply concepts of density based on area and volume of geometric figures in modeling situations** **MG.3 Apply geometric methods to solve design problems.**  |  -choosing the solid that models a word problem | **10-13 Geometric Measurement and Modeling**  |   |   |
| **Unit 11 Assessment (2 Days)**   | **Unit 11 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **18 Total Days (with 4 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NYS Next Gen Performance Indicators**    | **Objectives**  | **Text** **Resources**    | **Vocabulary/Major Topics/Concepts**   |  **Assessments &****Additional Content**   |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -draw circles with a compass-copy a triangle with compass and straight edge  | **4-1 Introduction to Constructions**  |  compass, straightedge,  |  <https://www.mathopenref.com/tocs/constructionstoc.html> |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -copy and construct angles | **4-2 Copying Angles and Creating Parallel Lines**  |   |   <https://www.mathopenref.com/constcopyangle.html>  <https://www.mathopenref.com/constparallel.html>  |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -construct a translation given a line segment or triangle | **4-3 Constructing Translations**  |  translation, parallelogram |   <https://www.mathopenref.com/constparalleltt.html>  |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -construct an angle bisector | **4-4 Bisecting an Angle**  |  angle bisector, perpendicular |   <https://www.mathopenref.com/constbisectangle.html>  |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -construct a perpendicular bisector-construct an altitude in a triangle | **4-5 Constructing a Perpendicular to a Line**  |  perpendicular bisector, altitude  |   <https://www.mathopenref.com/constbisectline.html>  |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -construct a reflection over a given line | **4-6 Constructing Reflections**  |  line reflection |   |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |   -find the circumcenter | **4-8 The Circumcircle and Its Center**  |  point of concurrency, circumcenter, circumcircle, equidistant  |   <https://www.mathopenref.com/constcircumcenter.html>  |
| **CO.12 Make, justify, and apply formal geometric constructions.**  |  -find the incenter of a triangle | **4-9 The Inscribed Circle and Its Center**  |  incircle, incenter, |   <https://www.mathopenref.com/constincenter.html>  |
| **CO.13 Make and justify the constructions for inscribing an equilateral triangle, a square and a regular hexagon in a circle.**  |  -inscribe a polygon in a circle | **4-11 Inscribing Regular Polygons in Circles**  |  inscribe, regular polygon,  |   <https://www.mathopenref.com/constinsquare.html> <https://www.mathopenref.com/constinhexagon.html>  |
| **Unit 4 Assessment (2 Days)**   | **Unit 4 Assessment** is on the eMathinstruction website, but instructors have the option to create their own.   **Exit Tickets** are found for each lesson on the eMathinstruction website, but instructors have the option to create their own.    |
| **13 Total Days (with 2 Flex Days)**   | Four days have been added into the unit pacing in case more days are needed for additional instruction    |