

High School Math Essential Standards
Geometry
Content Standards

Congruence (G.CO)

| Essential Standards | | Learning Targets | Student “I can” statements |
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| MGSE9-12.G.CO.5 | <p>Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</p> | <p>Students will be able to:</p> <p>a) Find and/or graph an image of a translation on the coordinate plane and write the coordinates of the transformed image using prime notation.</p> <p>b) Write a rule to describe a translation.</p> <p>c) Reflect a figure across either axis or a horizontal/vertical line. Write the coordinates of the transformed image using prime notation.</p> <p>d) Reflect a figure across the line $y = x$ or $y = -x$. Write the coordinates of the transformed image using prime notation.</p> <p>e) Rotate a figure about the origin clockwise or counter-clockwise 90°, 180° or 270°. Write the coordinates of the transformed image using prime notation.</p> <p>f) Perform composite transformations using combinations of translations, reflections and/or rotations, as well as mapping onto itself.</p> <p>g) Identify and describe a transformation given an image and its preimage.</p> | <p>When given a geometric figure and a specific transformation, I CAN draw the transformed figure by using graph paper or geometry soft/hardware.</p> <p>When given a preimage and an image, I CAN identify the type of transformation and write a rule to describe it (including identifying the line of reflection).</p> <p>Given two figures, I CAN specify a sequence of transformations that will carry one figure onto another.</p> <p>I CAN develop the definitions and/or coordinates of each transformation (rotations, reflections, translations) in regards to the characteristics between pre-image and image points.</p> |

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| <p>MGSE9-12.G.CO.9</p> | <p>Prove theorems about lines and angles. Theorems include:</p> <ul style="list-style-type: none"> - 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 | <p>Students will be able to:</p> <p>a) Identify and solve problems involving special pairs of angles formed by the intersection of 2 lines, including complementary and supplementary angles, linear pair (Linear Pair Postulate), and vertical angles (Vertical Angles Theorem)</p> <p>b) Identify and solve problems involving special pairs of angles formed by the intersection of parallel lines and a transversal including:</p> <ul style="list-style-type: none"> i) vertical angles are congruent ii) linear pair are supplementary iii) alternate interior angles are congruent iv) alternate exterior angles are congruent v) corresponding angles are congruent vi) same-side interior is supplementary vii) same-side exterior is supplementary <p>c) Determine from the relationships of special pairs of angles if lines are parallel, perpendicular or neither.</p> | <p>I CAN identify and use properties of perpendicular bisector.</p> <p>I CAN identify and use properties of all angle relationships, i.e. Vertical Angles, Linear Pairs, Complementary Angles, Adjacent Angles, and Supplementary Angles.</p> <p>I CAN recognize special relationships special angle relationship given parallel lines cut by a transversal angles.</p> <p>I CAN prove vertical angles are congruent.</p> |
| <p>MGSE9-12.G.CO.10</p> | <p>Prove theorems about triangles.</p> <p>Theorems include:</p> <ul style="list-style-type: none"> - measures of interior angles of a triangle sum to 180 degrees - 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 | <p>Students will be able to:</p> <p>a) Find missing angle measures in triangles using the Triangle Angle-Sum and Exterior Angles Theorems.</p> <p>b) Be able to prove the Triangle Sum Theorem and Base Angle Theorem of Isosceles Triangles.</p> <p>c) Be able to use the Midsegment Theorem to solve problems.</p> | <p>I CAN prove the Triangle Sum Theorem and use it to solve problems.</p> <p>I CAN identify an isosceles triangle and use the Base Angle Theorem and its converse in solving problems.</p> <p>I CAN prove the Base Angle Theorem of Isosceles Triangles.</p> <p>I CAN identify the midsegment of a triangle and use the Midsegment Theorem to solve problems.</p> |

Similarity, Right Triangles, and Trigonometry (G.SRT)

| Essential Standards | | Learning Targets | Student "I can" statements |
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| MGSE9-12.G.SRT.5 | <p>Use similarity and congruence and criteria for triangles to solve problems and to prove relationships in geometric figures.</p> <p>Similarity</p> <ul style="list-style-type: none"> - AA - SSS - SAS <p>Congruence</p> <ul style="list-style-type: none"> - SSS - SAS - ASA - AAS - HL (Right Triangles) | <p>Student will be able to:</p> <p>a) Find missing sides and angles of similar and congruent triangles.</p> <p>b) Justify triangles are similar by AA, SSS, or SAS.</p> <p>c) Justify triangles are congruent by SSS, SAS, ASA, AAS, or HL.</p> <p>d) Prove two triangles are similar and write similarity statements.</p> <p>e) Prove two triangles are congruent and write congruence statements, including CPCTC.</p> <p>f) Be able to provide the missing information in order to prove two triangles are congruent or similar.</p> | <p>I CAN recall postulates, theorems, and definitions to prove theorems about triangles.</p> <p>I CAN prove theorems involving similarity about triangles. (Theorems include: Triangle Proportionality Theorem; AA, SSS, and SAS).</p> <p>I CAN prove theorems involving congruence about triangles. (Theorems includes: SSS, SAS, ASA, AAS, and HL.)</p> <p>I CAN identify missing information needed to prove triangles are either similar or congruent.</p> <p>I CAN determine missing sides/angles for both congruent or similar triangles.</p> <p>I CAN identify when to use the following:</p> <ul style="list-style-type: none"> - Properties of Equality (Addition, Subtraction, Multiplication, Division, and Substitution) - Properties of Congruence (Symmetric, Reflexive, and Transitive) |
| MGSE9-12.G.SRT.8 | <p>Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p> | <p>Student will be able to:</p> <p>a) Correctly label the opposite/adjacent sides, given a reference angle Θ (theta), and the hypotenuse of a triangle.</p> <p>b) Use trigonometric ratios to solve for a missing side of a right triangle.</p> | <p>I CAN correctly label the legs and hypotenuse of a right triangle.</p> <p>I CAN determine when to use Pythagorean Theorem as opposed to Trigonometric Ratios</p> <p>I CAN correctly label the opposite/adjacent sides, given a reference angle Θ (theta), and the</p> |

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| | | <p>c) Use inverse trigonometric ratios to solve for a missing angle in a right triangle.</p> <p>d) Use Pythagorean Theorem to find missing sides of right triangles.</p> <p>e) Use trig ratios and/or the Pythagorean Theorem to find missing parts of a right triangle in applied problems.</p> <p>f) Determine sine or cosine of a given angle using complementary angles.</p> <p>g) Find angles of elevation/depression and use them to solve applied problems.</p> | <p>hypotenuse of a triangle.</p> <p>I CAN use trigonometric ratios and/or Pythagorean Theorem to solve for a missing side/angle of a right triangle.</p> <p>I CAN use trig ratios and/or the Pythagorean Theorem to solve applied problems.</p> <p>Given the cosine of an angle, I CAN state the sine of the complementary angle.</p> <p>I CAN identify angles of elevation and depression</p> |
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Circles (G.C)

| Essential Standards | | Learning Targets | Student "I can" statements |
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| MGSE9-12.G.C.2 | Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. 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 the tangent where the radius intersects the circle. | <p>Student will be able to:</p> <p>a) Identify and define circle vocabulary.</p> <p>b) Solve for the measures of angles and arcs with a circle.</p> <p>c) Solve for the missing length of segments with a circle.</p> <p>d) Identify the right angle formed by a tangent and a radius.</p> | <p>I CAN identify and define parts of a circle.</p> <p>I CAN solve for the measures of angles, arcs, and segments in a circle.</p> <p>I CAN solve for the missing angle or arc.</p> <p>I CAN identify the right angle formed by a tangent and a radius</p> <p>I CAN apply the formula for the arc length and area of a sector and solve for the missing</p> |

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| | | e) Apply the formula for the arc length and area of a sector and solve for the missing information. | information |
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Expressing Geometric Properties with Equations (G.GPE)

| Essential Standards | | Learning Targets | Student "I can" statements |
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| MGSE9-12.G.GPE.4 | Use coordinates to prove simple geometric theorems algebraically. (Focus on quadrilaterals, right triangles, and circles.) | <p>Student will be able to:</p> <p>a) Identify a right triangle based on the slope of the legs.</p> <p>b) Solve for sides, diagonals, and angles in special quadrilaterals.</p> <p>c) Find the coordinates of a missing vertex in a parallelogram.</p> <p>d) Use the distance formula or Pythagorean Theorem to determine if segments are congruent and find the perimeter of polygons, and the area of triangles, rectangles, and squares.</p> <p>e) Use the midpoint formula to determine if segments bisect.</p> <p>f) Given the center and the radius, write the equation of the circle.</p> | <p>I CAN identify a right triangle based on the slope of the legs.</p> <p>I CAN solve for missing sides, diagonals, and angles in special quadrilaterals..</p> <p>I CAN find the coordinates of a missing vertex of a parallelogram.</p> <p>I CAN use the distance formula or Pythagorean Theorem to determine if segments are congruent, the perimeter of polygons, and the area of triangles, rectangles, and squares.</p> <p>I CAN use the midpoint formula to determine if segments bisect.</p> <p>I CAN write the equation of a circle given the center and the radius.</p> |
| MGSE9-12.G.GPE.5 | Prove the slope criteria for parallel and perpendicular lines and use them | <p>Student will be able to:</p> | I CAN identify the slope of a graphed line. |

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| | <p>to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p> | <p>a) Show that lines with the same slope and different y-intercepts are parallel by graphing.</p> <p>b) Show that lines with the same slope and different y-intercepts are parallel by comparing their equations.</p> <p>c) Show that lines with negative (opposite) reciprocal slopes are perpendicular by looking at graphs.</p> <p>d) Show that lines with negative (opposite) reciprocal slopes are perpendicular by looking at equations.</p> <p>e) Use properties to solve geometric problems such as writing an equation of a line through a given point.</p> <p>f) Apply slope criteria to prove identity of geometric figures.</p> | <p>I CAN identify the slope in an equation.</p> <p>I CAN show that lines with the same slope and different y-intercepts are parallel by graphing.</p> <p>I CAN show that lines with the same slope and different y-intercepts are parallel by comparing their equations.</p> <p>I CAN show that lines with negative (opposite) reciprocal slopes are perpendicular by looking at graphs.</p> <p>I CAN show that lines with negative (opposite) reciprocal slopes are perpendicular by looking at equations.</p> <p>I CAN use properties to solve geometric problems such as writing an equation of a line through a given point.</p> <p>I CAN apply slope criteria to prove the identity of geometric figures.</p> |
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Geometric Measurement and Dimension (G.GMD)

| Essential Standards | | Learning Targets | Student "I can" statements |
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| MGSE9-12.G.GMD..3 | Use volume formulas for cylinders, pyramids, cones, and spheres to solve | Student will be able to: | I CAN match a solid to its name and volume |

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| | problems. | <p>a) Match a solid to its name and volume formula.</p> <p>b) Distinguish between height and slant height.</p> <p>c) Use formulas to find volume of cylinders, pyramids, cones, and spheres.</p> <p>d) Use the appropriate units.</p> | <p>formula.</p> <p>I CAN distinguish between height and slant height.</p> <p>I CAN use volume formulas for cylinders, pyramids, cones, and spheres.</p> <p>I CAN use the appropriate units.</p> |
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Conditional Probability and the Rules of Probability

| Essential Standards | | Learning Targets | Student "I can" statements |
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| <p>MGSE9-12.S.CP.5</p> | <p>Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.</p> | <p>Student will be able to:</p> <ul style="list-style-type: none"> a) Interpret information to create a Venn diagram or two-way frequency table to find situational probability. b) Determine if two events are independent. c) Given everyday situations (including AND, OR, and GIVEN statements) determine which probability formula from the EOC formula sheet to use and apply to the given problem. | <p>I CAN construct two-way frequency tables given data.</p> <p>I CAN interpret and make predictions based on two-way frequency tables.</p> <p>I CAN understand AND and OR statements when interpreting data.</p> <p>I will know when to select data based on the total set versus a subset (conditional probability).</p> |
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