

C2.0 Mathematics 8 Unit 4 Instructional Focus: Transformations and Geometric Measurement (40 Days)

Topic	Instructional Foci	Days
Topic 1: Congruence Through Rigid Transformations	<p>In this topic, students explore congruence through the effects of rigid transformations. They map one figure onto another using a sequence of translations, reflections, and rotations to determine whether figures are congruent. Students apply their understanding to determine which angles of parallel lines cut by a transversal are equal in measure and which are supplementary. They develop informal arguments to show that the sum of the degrees of interior angles of a triangle is 180°. Student understanding of rigid transformations will lay the foundation for future geometric investigations.</p> <p><u>Standard(s):</u></p> <p>8.G.1 – Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length; Angles are taken to angles of the same measure; Parallel lines are taken to parallel lines.</p> <p>8.G.2 – Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</p> <p>8.G.3 – Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p>8.G.5 – Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <i>For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.</i></p> <p><u>Sample Learning Tasks (SLTs)</u></p> <p>SLT 1: Explore congruence through rigid transformation.</p> <p>SLT 2: Explore the properties of translations on the coordinate plane.</p> <p>SLT 3: Explore the properties of reflections on the coordinate plane.</p> <p>SLT 4: Explore rotations on the coordinate plane.</p> <p>SLT 5: Perform sequences of rigid transformations on the coordinate plane.</p> <p>SLT 6: Describe a sequence of transformations that maps a pre-image to an image.</p> <p>SLT 7: Use informal arguments to establish facts about the angles created when parallel lines are cut by a transversal.</p> <p>SLT 8: Use informal arguments to establish facts about the angle sum and exterior angle of triangles</p> <p><u>Formative(s):</u></p> <p>Unit 4 Topic 1 Formative: This formative assessment is designed to assess student understanding after SLT 8.</p>	<i>approx.</i> 18

Topic	Instructional Foci	Days
Topic 2: Similarity Through Non-Rigid Transformations	<p>In this topic, students distinguish between similar and congruent shapes and identify that similar shapes have congruent angles and proportional side lengths. Students explore similarity by applying their knowledge of scale factor and using the properties of similarity. They describe the effect of dilations on figures and identify dilations as different from the rigid transformations of translations, rotations, and reflections. Students use informal arguments to establish the angle-angle criterion for similarity of triangles.</p> <p><u>Standard(s):</u></p> <p>8.G.3 – Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p>8.G.4 – Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p> <p>8.G.5 – Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <i>For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.</i></p> <p><u>Sample Learning Tasks (SLTs)</u></p> <p>SLT 9: Investigate congruent and non-congruent figures</p> <p>SLT 10: Demonstrate similarity by performing dilations on a coordinate plane.</p> <p>SLT 11: Determine the criteria necessary to determine if triangles are similar.</p> <p>SLT 12: Perform and describe a sequence of transformations that shows two figures are similar.</p> <p><u>Formative(s):</u></p> <p>Unit 4 Topic 2 Formative: This formative assessment is designed to assess student understanding after SLT 12.</p>	<i>approx.</i> 11

Topic	Instructional Foci	Days
Topic 3 (continued): Volume of Cones, Cylinder, and Spheres	<p>In this topic, students determine the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. They apply their understanding of numerical and algebraic expressions to solve problems using volume formulas. Students compare the ratios of the volumes of cones and cylinders with the same height and same base.</p> <p><u>Standard(s):</u> 8.G.9 – Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems</p> <p><u>Sample Learning Tasks (SLTs)</u> SLT 13: Investigate the volumes of three-dimensional solids. SLT 14: Determine the volumes of three-dimensional solids. SLT 15: Apply volume formulas to solve problems SLT 16: Solve problems by reasoning with volume formulas</p> <p><u>Formative(s):</u> Unit 4 Topic 3 Formative: This formative assessment is designed to assess student understanding after SLT 16.</p>	<p>approx. 11</p>