

## C2.0 Investigations into Mathematics Unit 7 Course Outline

## Transformations and Geometric Measurement

Topic	Instructional Foci
<b>Topic 1: Congruence Through Rigid Transformations</b>	<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 <math>180^\circ</math>. Student understanding of rigid transformations will lay the foundation for future geometric investigations.</p> <p><u>Concepts:</u>          Explore congruence through rigid transformation.          Explore the properties of translations on the coordinate plane.          Explore the properties of reflections on the coordinate plane.          Explore rotations on the coordinate plane.          Perform sequences of rigid transformations on the coordinate plane.          Describe a sequence of transformations that maps a pre-image to an image.          Use informal arguments to establish facts about the angles created when parallel lines are cut by a transversal.          Use informal arguments to establish facts about the angle sum and exterior angle of triangles</p>
Topic	Instructional Foci
<b>Topic 2: Similarity Through Non-Rigid Transformations</b>	<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>Concepts:</u>          Investigate congruent and non-congruent figures          Demonstrate similarity by performing dilations on a coordinate plane.          Determine the criteria necessary to determine if triangles are similar.          Perform and describe a sequence of transformations that shows two figures are similar.</p>

Topic	Instructional Foci
<b>Topic 3: Volume of Cones, Cylinders, and Spheres</b>	<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>Concepts:</u> Investigate the volumes of three-dimensional solids. Determine the volumes of three-dimensional solids. Apply volume formulas to solve problems. Solve problems by reasoning with volume formulas.</p>