



Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Grade 8 Mathematics

<b>Unit title</b>	<i>Unit 1: Transformations, Congruence, and Similarity</i>	<b>MYP year</b>	3	<b>Unit duration (hrs)</b>	25 Hours
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**Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?***

### GSE Standards

#### Standards

**Understand congruence and similarity using physical models, transparencies, or geometry software.**

**MGSE8.G.1** Verify experimentally the congruence 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.

**MGSE8.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.

**MGSE8.G.3** Describe the effect of dilations, translations, rotations and reflections on two- dimensional figures using coordinates.

**MGSE8.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.

**MGSE8.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.

#### Concepts/Skills to be Mastered by Students

- Develop the concept of transformations and the effects that each type of transformation has on an object.
- Explore the relationship between the original figure and its image in regards to their corresponding parts being moved an equal distance which leads to the concept of congruence of figures.
- Learn to describe transformations with both words and numbers.
- Relate rigid motions to the concept of symmetry and to use them to prove congruence or similarity of two figures.

- Physically manipulate figures to discover properties of similar and congruent figures; and focus on the sum of the angles of a triangle and use it to find the measures of angles formed by transversals (especially with parallel lines), find the measures of exterior angles of triangles, and to informally prove congruence.

**Vocabulary**

- Alternate Exterior Angles- A pair of angles on the outer side of each of those two lines but on opposite sides of the transversal.
- Alternate Interior Angles- Alternate interior angles lie within a pair of lines and on opposite sides of a transversal.
- Angle of Rotation- The number of degrees a figure is rotated.
- Congruent Figures- Two two-dimensional figures are congruent ( $\cong$ ) if the second can be obtained from the first by a sequence of rotations, reflections, and translations.
- Corresponding Sides- Corresponding sides are the sides that are in the same position in any different 2-dimensional shapes.
- Corresponding Angles- Corresponding angles lie on the same side of a transversal and in corresponding positions.
- Dilation- A dilation is a transformation that moves each point along the ray through the point, starting from a fixed center, and multiplies distances from the center by a common scale factor.
- Linear Pair- Linear pair of angles are formed when two lines intersect each other at a single point.
- Reflection- A reflection, or flip, is a transformation that flips a figure across a line of reflection.
- Reflection Line- A line of reflection is a line across which a figure is reflected.
- Rotation- A rotation is a rigid motion that turns a figure around a fixed point, called the center of rotation.
- Same-Side Interior Angles- Same-side interior angles are in the interior of two lines on the same side of a transversal.
- Same-Side Exterior Angles- Two angles that are exterior to the parallel lines and on the same side of the transversal line
- Scale Factor- The scale factor is the ratio of a length in the image to the corresponding length in the original figure.
- Similar Figures- two-dimensional figure is similar ( $\sim$ ) to another two-dimensional figure if you can map one figure to the other by a sequence of rotations, reflections, translations, and dilations.
- Transformation- A transformation is a change in position, shape, or size of a figure. Three types of transformations that change position only are translations, reflections, and rotations.
- Translation- A translation, or slide, is a rigid motion that moves every point of a figure the same distance and in the same direction.
- Transversal- A transversal is a line that intersects two or more lines at different points.
- Vertical Angles - Vertical angles are angles that are opposite of each other.

Key concept	Related concept(s)	Global context
Form	Justification and Simplification	Scientific Technical Innovation
<b>Statement of inquiry</b>		
Modeling the changes that occur in geometric forms helps us to understand art and design.		
<b>Inquiry questions</b>		

**Factual**— What are transformations (i.e. translations, reflections, rotations, and dilations)? What angles are formed when two parallel lines are cut by a transversal?

**Conceptual**—How can physical models increase our understanding of congruent and similar figures?

**Debatable**—Which transformation is most recognizable out of a sequence of transformations on a coordinate plane? Justify your reasoning.

MYP Objectives	Assessment Tasks	
<i>What specific MYP <b>objectives</b> will be addressed during this unit?</i>	<i>Relationship between summative assessment task(s) and statement of inquiry:</i>	<i>List of common formative and summative assessments.</i>
Criterion B: Investigating Patterns	Students will model the changes in geometric form to help them understand transformations in mathematics.	<p><b><u>Formative Assessment(s):</u></b></p> <p>Unit 1 CFA</p> <p><b><u>Summative Assessment(s):</u></b></p> <p>Unit 1: Transformations, Congruence, and Similarity</p> <p>MYP: Kente' Cloth Project</p>
Approaches to learning (ATL)		
<p>Give and receive meaningful feedback.</p> <p>Manage and resolve conflict and work collaboratively in teams.</p> <p>Draw reasonable conclusions and generalizations</p> <p><b>Category:</b></p> <p><b>Cluster:</b></p> <p><b>Skill Indicator:</b></p>		

**Learning Experiences**

Add additional rows below as needed.

<b>Objective or Content</b>	<b>Learning Experiences</b>	<b>Personalized Learning and Differentiation</b>
<b>MGSE8.G.1</b> Verify experimentally the congruence 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.	Desmos Golf Rigid Transformations	This task can be done with strategically grouped students. Students who are struggling will be prompted to use manipulatives and create concrete representations of the problem.
<b>MGSE8.G.3</b> Describe the effect of dilations, translations, rotations and reflections on two dimensional figures using coordinates.	Patty Paper Discovery Activity	Students who need scaffolding should be provided additional examples to work and reason through. Teachers should group students strategically and provide scaffolds through intentional questioning.
<b>MGSE8.G.4</b> 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	XY Pegboard Discovery Activity	The goal of this activity is to engage students in strengthening their skills in transformations. For groups that are struggling, the teacher can be an active participant, modeling the thought process behind the activity. Teachers should group students strategically and provide scaffolds through intentional questioning
<b>Content Resources</b>		