Unit 9: Congruence

Dear Parents/Guardians,

Unit 9 introduces students to transformations in geometry. Using patty paper, students will explore translations, rotations, and reflections, noting how the transformation moves the plane and the location change of a given figure. Students will perform rigid motion transformations on coordinate planes, recording their moves in pictures, words, coordinates and symbolic notation. Students will determine that figures are congruent if one can be obtained from the other by a sequence of (one or more) translations, rotations and/or reflections.

Translations

An original figure is referred to as a "pre-image" and is always shaded in the lessons. A figure that results after a transformation is called an "image" figure.

A translation, or "slide", of the plane shifts all the points in the same distance and in the same direction.

Picture	Words	Coordinates	Symbolic
	The pre-image is translated 1 unit to the right and 5 units down to create the image.	A (4,1) maps to A' (5, -4). B (1,1) maps to B' (2, -4). C (1,4) maps to C' (2, -1).	$(x,y) \rightarrow (x+1, y-5)$

Rotations

A rotation, or "turn", of a plane rotates the plane through a given angle about a given point.

Picture	Words	Coordinates	Symbolic
	The pre-image is rotated about the origin clockwise 90° to create the image.	A (4,1) maps to A' (1, -4). B (1,1) maps to B' (1, -1). C (1, 4) maps to C' (4, -1).	$(x,y) \rightarrow (y, -x)$

Reflections

A reflection, or "flip", of a plane flips the plane over a given line.

Picture	Words	Coordinates	Symbolic
	The pre-image is reflected over the y-axis to create the image.	A (4,1) maps to A' (-4,1). B (1,1) maps to B' (-1,1). C (1,4) maps to C' (-1,4).	$(x,y) \rightarrow (-x, y)$

By the end of the unit, your student should know…

- How to perform translations using patty paper and on coordinate planes [Lesson 9.1]
- How to perform rotations using patty paper and on coordinate planes [Lesson 9.2]
- How to perform reflections using patty paper and on coordinate planes [Lesson 9.3]
- The definition of congruence and apply the definition to show that two figures are congruent [Lesson 9.3]

Additional Resources

- For definitions and additional notes please refer to Student Resources at the end of this unit.
- Transformations: https://youtu.be/7h46hKwyahQ https://youtu.be/KbNFTUgNJw4