Curriculum Units and Learning Outcomes

Content Area: Grade 8 Math	**Grade Level: 8**
Unit Title: Unit 10 - Transformations on the Coordinate Plane	

Unit Summary: Students will be manipulate shapes by using dilations, reflections, translations, and rotations. They will be able to identify if the shapes are similar or congruent in order to find missing dimensions about the shapes.

Massachusetts Standards:

- 8.G.A.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; and parallel lines are taken to parallel lines.
- 8.G.A.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 to congruent figures, describe a sequence that exhibits the congruence between them.
- 8.G.A.3: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- 8.G.A.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.

Enduring Understandings: Students will understand that:

- Two figures are congruent to each other if there exists a sequence of rigid transformations that will map one figure onto the other.
- Two figures are similar to each other if there exists a sequence of dilations and rigid transformations that will map one figure onto the other.
- Certain properties are preserved under rigid transformations (such as angle measurement, line segment length, and parallel line relationships).

Essential Questions:

- Why are geometry and geometric figures relevant and important?
- How can geometric ideas be communicated using a variety of representations?

- How can geometry be used to solve problems about real-world situations, spatial relationships, and logical reasoning?

Students will demonstrate KNOWLEDGE of:	**Students will be SKILLED at**:
● Translating figures in the coordinate plane. ● Reflecting figures in the coordinate plane. ● Rotating figures in the coordinate plane. ● Understanding the concept of congruent figures. ● Dilating figures in the coordinate plane. ● Understanding the concept of similar figures. ● Finding perimeters and areas of similar figures.	● Identifying a translation. ● Finding the coordinates of a translated figure. ● Using coordinates to translate a figure. ● Identifying a reflection. ● Finding the coordinates of a figure reflected in an axis. ● Using coordinates to reflect a figure in the x- or y-axis. ● Identifying a rotation. ● Finding the coordinates of a figure rotated about the origin. ● Using coordinates to rotate a figure about the origin. ● Identifying congruent figures. ● Describing a sequence of rigid motions between two congruent figures. ● Identifying a dilation. ● Finding the coordinates of a figure dilated with respect to the origin. ● Using coordinates to dilate a figure with respect to the origin. ● Identifying similar figures. ● Describing a similarity transformation between two similar figures. ● Using corresponding side lengths to compare perimeters of similar figures. ● Using corresponding side lengths to compare areas of similar figures. ● Using similar figures to solve real-life problems involving perimeter and area.

Estimated Duration: 19