### Unit Seven Information

Curriculum Map: Transformations on the Coordinate Plane

Content Descriptors:
- Concept 1: Experiment with transformations in the plane

Content from Frameworks: Transformations on the Coordinate Plane

Unit Length: Approximately 7 days
# Unit 7: Curriculum Map

## Unit Rational:

In previous grades, students have experience with rigid motions: translations, reflections, and rotations. Work in this area continues to build upon those experiences and makes the connections to transformations of geometric figures.

## Prerequisites: As identified by the GSE Frameworks

- plotting points on a coordinate plane
- congruence of geometric figures and the correspondence of their vertices, sides, and angles
- recognizing line and rotational symmetry
- interpreting and sketching views from different perspectives
- calculate the perimeter and area of fundamental geometric plane figures
- use the concepts of ratio, proportion, and scale factor to demonstrate the relationships between similar plane figures

## Length of Unit: 7 Days

## Concept 1

**Experiment with transformations in the plane**

**GSE Standards**

### MGSE9-12.G.CO.1
Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

### MGSE9-12.G.CO.2
Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

### MGSE9-12.G.CO.3
Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

### MGSE9-12.G.CO.4
Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

### MGSE9-12.G.CO.5
Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

## Lesson Essential Question

- How do you determine the type of transformation that has occurred?
- Can a transformation change an object’s position, orientation, and / or size?
- How do transformations of geometric figures and functions compare?
- How do we know which transformations have created the mapping of an image?
- How do we translate geometric figures in the coordinate plane?
- How are reflections and rotations similar and different?
- How can we describe / represent a transformation (or series of transformations) that take place in the coordinate plane?
- How can the coordinate plane help me understand properties of reflections, translations and rotations?
- How do I apply what I’ve learned about transformations to figures in the coordinate plane?
- What are the effects of transformations on geometric figures?
- How do we define and create geometric transformations?
- What are the effects of transformations on geometric figures?
- Which transformations create isometries?
- How do we reflect points in a coordinate plane?
- What is the relationship between reflections, translations and rotations?
### Vocabulary

- Angle, Angle of Rotation, Bisector, Circle, Congruent, Corresponding angles, Corresponding sides, Endpoint, Image, Intersection, Isometry, Line, Line segment, Parallel lines, Perpendicular lines, point, Pre-Image, ray, Reflection, Reflection Line, Rotation, Segment, Transformation, Translation, Vertex

### Resources

- Geometry Vocabulary Graphic Organizer
- Intro to Transformations, Notes and Practice
- Coordinate Transformations Notes with practice
- Graphic Organizer - Transformations foldable
- Task or Relay Cards
- Practice 1 Practice 2
- Real World Furniture Scenario/Practice (great task)

#### These tasks were taken from the GSE Frameworks

- Transformational Geometry Applet – Interactive Technology
- Guided Notes Template
- Translations Task TE SE
- Exploring Reflections and Rotation TE SE
- Culminating Unit Activity TE SE
- Project Tasks Intro into Reflections & Translations TE SE
- Transforming Shapes TE SE

### Differentiated Activities

- Transformations FAL
- Transformations Task Word Power Point
- Smiley Face Task TE SE

#### These tasks were taken from the GSE Frameworks
At the end of Unit student’s should be able to say “I can…”

- describe and compare function transformations on a set of points as inputs to produce another set of points as outputs, including translations and horizontal or vertical stretching
- represent and compare rigid and size transformations of figures in a coordinate plane using various tools such as transparencies, geometry software, interactive whiteboards, waxed paper, tracing paper, mirrors and digital visual presenters.
- compare transformations that preserve size and shape versus those that do not.
- describe rotations and reflections of parallelograms, trapezoids or regular polygons that map each figure onto itself.
- develop and understand the meanings of rotation, reflection and translation based on angles, circles, perpendicular lines, parallel lines and line segments.
- transform a figure given a rotation, reflection or translation using graph paper, tracing paper, geometric software or other tools.
- create sequences of transformations that map a figure onto itself or to another figure.