# Anoka-Hennepin Secondary Curriculum Unit Plan

| Department: | Mathematics | Course: | Geometry (Honors) | Unit 9 Title: | Transformations | Grade Level(s): | 8, 9, 10 |
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| Assessed Trimester: | Trimester B | Pacing: | High School: 8 - 11<br>Middle School: 8 - 13 | Date Created: | 05/22/2014 | Last Revision Date: | 08/20/2014 |

**Course Understandings**: *Students will understand that:*

B. Coordinate geometry can be used in order to demonstrate spatial relationships.

D. Transformations are performed to affect the figure.

G. Visualization, spatial reasoning and geometric modeling can be used to solve geometric problems.

## DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

### Established Goals

**Minnesota State/Local/Technology Standard(s) addressed (2007):**

- **Standard (9.3.4.#):** Solve real-world and mathematical geometric problems using algebraic methods.
  **Benchmark:**
  **9.3.4.6** Use numeric, graphic and symbolic representations of transformations in two dimensions, such as reflections, translations, scale changes and rotations about the origin by multiples of 90˚, to solve problems involving figures on a coordinate grid.

### Transfer

**Students will be able to independently use their learning to: (product, high order reasoning)**

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### Meaning

| Unit Understanding(s): | Essential Question(s): |
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| **Students will understand that:**<br>● Calculate slope of a line or segment;<br>● Calculate the distance between two points on a coordinate plane;<br>● Calculate the midpoint of a segment, given the coordinates of the endpoints;<br>● List the center and radius of a circle, given its equation;<br>● Write the equation of a circle, given its center and radius (or diameter);<br>● Calculate the coordinates of a point after an isometry (reflection over an axis, rotation of a multiple of 90 degrees about the origin, translation). | **Students will keep considering:** |

### Acquisition

| Knowledge - Students will: | Reasoning - Students will: |
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| ● Identify the following transformations and know that they are isometries:<br>○ Reflection<br>○ Rotation | ● Distinguish the type of transformation(s) in a given picture<br>● Predict the image of a transformation when given a preimage |

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| ○ Translation<br>○ Glide Reflection<br>● Recognize the difference between the image and preimage<br>● Line of symmetry<br>● Rotational symmetry<br>● Identify when a dilation is an enlargement ($k > 1$) or a reduction ($k < 1$)<br>● Identify transformations and compositions of transformations | **Skills - Students will:**<br>● Perform a given transformation on a coordinate grid |

| **Common Misunderstandings** | **Essential new vocabulary** |
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| ● Students sometimes confuse clockwise rotations with counterclockwise rotations.<br>● Students sometimes confuse a rotation of positive degree measure, which rotates a figure counterclockwise, with a rotation of negative degree measure, which rotates a figure clockwise.<br>● Students often mistake the formula for slope with the formula for midpoint and/or the Distance Formula. | ● compositions<br>● dilation<br>● glide reflection<br>● line of symmetry<br>● reflection<br>● rotation<br>● rotational symmetry<br>● translation |