EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM

Mathematics Within: Shape, Space & Measurement

Lesson Plan

Participant Name: John Zetah **School District:** Edina

Broad Topic: Geometry **Specific Topic:** Rotation Symmetry

Objectives:

a) The students will create symmetric patterns and figures using rotation symmetry.
b) The students will explore rotation symmetry using manipulatives.
c) The students will review reflection symmetry and rotation.

Materials & Supplies:

- Grid Paper
- Geoboards
- Cut-outs (Triangles)
- Geoboard bands (colored)
- Patty Paper

Lesson:

- Intro – Define symmetry and show an example of reflection symmetry. Define rotation and have the class physically show turns of 360°, 180°, and 90°. Reveal that they will explore and create symmetric figures and patterns using rotation and symmetry.
- Activity 1 – Use the triangle cutouts to model how the original figure rotates to a new image around a center of rotation.
- Activity 2 – Explore the technique of using patty paper to create symmetric patterns and figures on grid paper.
    - Place patty paper over original grid and shade in the original figure. Copy the center of rotation on the patty paper. Rotate the copied image to the desired location. Shade in rotated image onto the grid paper.
    - Have the students create a proof why the pattern or figure is symmetric.
    - Also, extend this activity looking at the lines of reflection that may exist.
    - *Grid paper – Before hand, create 4x4 grids or 8x8 grids. (Attached pages 2 & 3.) Have the center of rotation be in the middle of the grid. In one of the quadrants, shade in the starting original figure.
- Activity 3 – Have the students create a symmetric pattern or figure using a geoboard. The students need to use a color for the original figure and the rest of the pattern or figure needs to be in another color.
    - Have the students share their geoboards and how they created it.
    - * Identifying – Push the students to use the language “this figure/pattern has a rotation symmetry of order (number).” The order number is how many turns it takes to come back to the original figure.
- Assessment – Use observation of activities 2 and 3 to assess where the students are at. Create a grid 4x4 with a starting figure or pattern. Challenge the students to create a symmetric pattern or figure using a rotation symmetry of order 4.
- Closure – Choose a symmetric figure that has rotation symmetry and reflection symmetry. Have the students find the line or reflection(s), center of rotation, rotation symmetry of order and original figure.

Fits into Edina Curriculum:

- Everyday Mathematics Grade 3: Unit 6