ISOMETRIES - UNIT A

This unit focuses primarily on isometries, although some introduction to dilations is included.

A POSSIBLE BASIC SEQUENCE

A1 Overview of Transformations (2-4 hours): Participants experience examples of transformations through hands-on activities, which include a patty paper translation and a rubber band dilation. They view transformations as functions, and observe some of the basic properties of isometries and dilations. They link the concept of congruency to isometry, and similarity to dilation.

The beginning of the unit may be an appropriate time to distribute:

- Common Core Standards for Geometry (Grades K-HS)
- A list of definitions (for reference)
- Introductory essays about Transformations

A2 Translations (1-2 hours): Participants experiment with translations, and learn some properties of this isometry. Participants use translations to create 3-dimensional figures.

> **A5 Investigating Transformations with Coordinates (1/2 hour):** Include Exploration 1 to further examine translations

A3 Reflections (2-3 hours): Participants will use their spatial visualization skills to investigate reflections. Participants will understand the connections between an original figure and its image and make summary statements on their findings.

> **A5 Investigating Transformations with Coordinates (1/2 hour):** Include Exploration 2 to further examine reflections.

A4 Rotations: (2-3hours): Participants experiment with rotations, and learn some properties of this isometry. Participants use rotations to create a design. Participants explore how translations and rotations can be obtained from a composition of reflections.

> **A5 Investigating Transformations with Coordinates (1/2 hour):** Include Exploration 3 to further examine rotations.

A6 Congruence (1/2 hour): Participants show that two figures are congruent by finding a sequence of translations, reflections, and rotations of the plane that map a figure onto itself.

A7 Algebraic Transformations (1 hour): This activity is also included in the Dilations Unit. Participants perform transformations in the plane and determine whether they are isometries, dilations, or neither. Various counterexamples will help participants further understand properties of isometries.

A8 Transformation Golf (1/2 hour): Participants play a game online that will improve their transformation visualization skills.