

Unit 7 Intro to Transformations

Content Area: **Mathematics**
Course(s): **Math 7**
Time Period: **May**
Length: **1 week**
Status: **Published**

Unit Summary

In this unit, students will be introduced to transformations, a standard covered in eighth grade. Students will use and extend their prior knowledge of the rectangular coordinate system to draw and transform figures. Students will identify basic transformations (translation, reflection, rotation, and dilation). Students will identify the relationship between transformations and similarity/proportional relationships.

Standards

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.8.G.A	Understand congruence and similarity using physical models, transparencies, or geometry software.
MA.8.G.A.1	Verify experimentally the properties of rotations, reflections, and translations:
MA.8.G.A.1c	Parallel lines are transformed to parallel lines.
MA.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 two congruent figures, describe a sequence that exhibits the congruence between them.
MA.8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
MA.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.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.A.CS1	Understand and use technology systems.
TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.D.CS2	Demonstrate personal responsibility for lifelong learning.

Student Learning Objectives

- Students will learn transformations determine coordinates on rectangular coordinate system of a figure after a translation, reflection, rotation, or dilation.

Essential Questions

- How does a transformation of a figure relate to similarity and proportionality?
- How can a transformation be represented on a coordinate plane?
- How can a figure's position change without changing its size and shape? How can a figure's size change without changing its shape?

Enduring Understandings

- Students understand that performing one or multiple transformations impact the ordered pairs for each vertex.
- Students will understand that the sequence of transformations can be determined by a given an image and a preimage.

Application

- Students will be able to independently use their learning to understand that a preimage is the figure before a transformation and the image is the figure after any transformation is performed.
- Students will be able to independently use their learning to create a mirror image using a reflection.
- Students will be able to independently use their learning to turn a figure about a point creating a rotation.
- Students will be able to independently use their learning to slide a figure around on the rectangular coordinate system while keeping the figure's shape intact creating a translation.
- Students will be able to independently use their learning to use a dilation to shrink or enlarge a figure.
- Students will be able to independently use their learning to understand congruence and similarity using models on a coordinate plane.
- Students will be able to independently use their learning to use angle-angle criterion to determine angle measurements within triangles (triangles overlap).
- Students will be able to independently use their learning to appropriately utilize mathematical vocabulary such as transformation, preimage, image, reflection, rotation, translation, dilation, congruent, similarity.

Skills

Students will be skilled at:

- Identifying and graphing points on a rectangular coordinate system.
- Determining image coordinates after a transformation (translation, reflection, rotation, dilation).
- Identifying a transformation as a translation, reflection, rotation or dilation.
- Describing the transformation(s) utilized to get from figure one to figure two; given transformations to determine if figures are similar.
- Determining if two figures are congruent; given a series of transformations and given congruent figures.
- Proving that lines, line segments, and angles remain the same after some transformations.
- Utilizing a ruler or manipulatives.

