

Unit 9 Properties of Transformations

Content Area: **Math**
Course(s): **CP Geometry**
Time Period: **Marking Period 4**
Length: **1**
Status: **Published**

Unit Overview

In this chapter unit students will perform translations with vectors and algebra. They will reflect figures in a given line, rotate figures about a point, identify line and rotational symmetry, and perform dilations.

Enduring Understandings

Different transformations may be performed on a coordinate plane using various methods.

Students will understand and perform congruence and similarity transformations.

Students will make real-world connections to symmetry and tessellations.

Students will understand and apply vectors in Geometry.

Essential Questions

What is a reflection?

How do reflections relate to congruence?

What are congruence transformations?

What do reflections preserve?

How do we use reflections to prove congruence among figures?

What type of congruence transformation can be done using a vector?

How do compositions of reflections affect a figure?

What are rotations?

What symmetry exists with reflections and rotations?

What are dilations?

How do dilations relate to similarity?

New Jersey Student Learning Standards (No CCS)

MA.G-CO.A.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).
MA.G-CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
MA.G-CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
MA.G-CO.A.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.
MA.G-CO.B	Understand congruence in terms of rigid motions
MA.G-CO.B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
MA.G-CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
MA.G-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
MA.G-SRT.A	Understand similarity in terms of similarity transformations
MA.G-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor:
MA.G-SRT.A.1a	A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
MA.G-SRT.A.1b	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
MA.G-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
MA.G-MG	Modeling with Geometry
MA.G-MG.A	Apply geometric concepts in modeling situations

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
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Financial Literacy Integration

PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.

Instructional Strategies & Learning Activities

- Use the book activities and extensions to give added dimension.
- ~~In-class investigations and hands-on exploration of transformations with use of Geometer's Sketchpad.~~
- Symmetry Project.
- Partner/group work.
- Lesson discovery activities.
- Use problems and activities from book involving modeling problems.
- Provide access to online book
- Provide access to book pages and problems through Canvas and Twitter
- Provide access to review keys

Formative Assessments

- Daily homework checks
- Quiz
- Chapter Unit Test
- Exit Tickets

- Warm-ups

Summative Assessment

- Unit Test
- Unit Project (Optional)

Benchmark Assessments

Students will take NJSLA Geometry Benchmark A

Alternate Assessments

- Modified homework
- Modified quizzes
- Modified tests
- Modified projects