

# Unit 6 Similarity

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

## Course Pacing Guide

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Unit	MP	Weeks
Essentials of Geometry (Ch.1)	1	4
Reasoning and Proof (Ch.2)	1	3
Parallel and Perpendicular Lines (Ch.3)	1	3
Congruent Triangles (Ch.4)	1	4
Relationships within Triangles (Ch.5)	2	3
Similarity (Ch.6)	2	3
Right Triangles and Trigonometry (Ch.7)	2	5
Quadrilaterals (Ch.8)	3	3
Properties of Transformations (Ch.9)	3	1
Properties of Circles (Ch.10)	3	3
Measurement of Figures and Solids (Ch.11)	4	8

## Unit Overview

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In this chapter students use proportions to identify similar polygons and find the scale factor between two polygons, they use a scale factor to find corresponding lengths in similar polygons, and they use the AA Similarity Postulate, the SSS Similarity Theorem, or the SAS Similarity Theorem to determine whether two triangles are similar. Also, students use proportions and the Triangle Proportionality Theorem or its converse to find the lengths of segments related to triangles or parallel lines. Finally, students perform dilations that are reductions or enlargements and they verify that a figure is similar to its dilation.

## Enduring Understandings

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Similar figures have congruent angles but proportional side lengths.

Students will understand how to use ratios and proportions to solve geometric problems.

Students will understand how to show that triangles are similar.

Students will understand how to use indirect measurement and similarity.

## Essential Questions

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How do you set up and solve a proportion?

What ways can you show two triangles are similar?

What transformations produce similar figures?

How can we perform these transformations on the coordinate plane?

## New Jersey Student Learning Standards (No CCS)

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MA.G-CO.A	Experiment with transformations in the plane
MA.G-CO.C	Prove geometric theorems
MA.G-CO.C.9	Prove theorems about lines and angles.
MA.G-CO.C.10	Prove theorems about triangles.
MA.G-MG	Modeling with Geometry
MA.G-MG.A	Apply geometric concepts in modeling situations
MA.G-MG.A.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
MA.G-GPE.B	Use coordinates to prove simple geometric theorems algebraically
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.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
MA.G-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
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.B	Prove theorems involving similarity
MA.G-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
MA.G-SRT.C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

## **Amistad Integration**

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SOC.9-12.1.1.1	Compare present and past events to evaluate the consequences of past decisions and to apply lessons learned.
SOC.9-12.1.3.3	Gather relevant information from multiple sources representing a wide range of views (including historians and experts) while using the date, context, and corroborative value of the sources to guide the selection.

## **Holocaust/Genocide Education**

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SOC.9-12.1.1.1	Compare present and past events to evaluate the consequences of past decisions and to apply lessons learned.
SOC.9-12.1.3.3	Gather relevant information from multiple sources representing a wide range of views (including historians and experts) while using the date, context, and corroborative value of the sources to guide the selection.

## **Interdisciplinary Connections**

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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**

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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**

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## Financial Literacy Integration

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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

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- Lesson Discovery Activities
- Partner/ Group Work
- In class investigations and hands-on exploration of transformations with use of Geometer's Sketchpad
- Shadow activity
- Dilations and AA similarity activity
- Dilations activity

## Differentiated Instruction

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- Inquiry/Problem-Based Learning
- Learning preferences integration (visual, auditory, kinesthetic)
- Tiered Learning Targets
- Meaningful Student Voice & Choice
- Relationship-Building & Team-Building
- Self-Directed Learning
- Debate
- Student Data Inventories
- Goal-Setting & Learning Contracts
- Game-Based Learning
- Grouping
- Rubrics
- Jigsaws
- Learning Through Workstations
- Concept Attainment
- Flipped Classroom
- Mentoring
- Assessment Design & Backwards Planning

## **Formative Assessments**

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- Daily homework checks
- Quiz
- Chapter Test
- Exit Tickets
- Warm-ups

## **Summative Assessment**

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- Unit Test
- Unit Project

## **Benchmark Assessments**

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Students will take NJSLA Geometry Benchmark A

## **Alternate Assessments**

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

## **Resources & Technology**

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- google docs, spreadsheets, slides
- TI graphing calculator
- protractor, ruler
- document camera
- chromebooks
- Promethean board
- websites: desmos, geogebra, EdPuzzle

- Canvas

## **BOE Approved Texts**

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Holt McDougal Larson Geometry

BOE Approved 1/8/2015

## **Closure**

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- Low-Stakes Quizzes - Give a short quiz using technologies like Kahoot or a Google form.
- Have students write down three quiz questions (to ask at the beginning of the next class).
- Have students dramatize a real-life application of a skill.
- Ask a question. Give students ten seconds to confer with peers before you call on a random student to answer. Repeat.
- Have kids orally describe a concept, procedure, or skill in terms so simple that a child in first grade would get it.
- Direct kids to raise their hands if they can answer your questions. Classmates agree (thumbs up) or disagree (thumbs down) with the response.
- Have kids create a cheat sheet of information that would be useful for a quiz on the day's topic.
- Kids write notes to peers describing what they learned from them during class discussions.
- Have students fill out a checklist with the objectives for the day.
- Have students complete an exit ticket without putting their name on it. Hand back exit tickets the next day in class and have students correct as a warm up.
- Ask students to write what they learned, and any lingering questions on an "exit ticket". Before they leave class, have them put their exit tickets in a folder or bin labeled either "Got It," "More Practice, Please," or "I Need Some Help!"
- After writing down the learning outcome, ask students to take a card, circle one of the following options, and return the card to you before they leave: "Stop (I'm totally confused. Go (I'm ready to move on.)" or "Proceed with caution (I could use some clarification on . . .)"

## **ELL**

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- Alternate Responses
- Advance Notes

- Extended Time
- Teacher Modeling
- Simplified Written and Verbal Instructions
- Frequent Breaks
- E-Dictionaries
- Google Translate

## **Special Education**

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- Shorten assignments to focus on mastery of key concepts.
- Specify and list exactly what the student will need to learn to pass.
- Evaluate the classroom structure against the student's needs (flexible structure, firm limits, etc.).
- Keep workspaces clear of unrelated materials.
- Keep the classroom quiet during intense learning times.
- Reduce visual distractions in the classroom (mobiles, etc.).
- Provide a computer for written work.
- Seat the student close to the teacher or a positive role model.
- Provide an unobstructed view of the chalkboard, teacher, movie screen, etc.
- Keep extra supplies of classroom materials (pencils, books) on hand.
- Maintain adequate space between desks.
- Give directions in small steps and in as few words as possible.
- Number and sequence the steps in a task.
- Have student repeat the directions for a task.
- Provide visual aids.
- Go over directions orally.
- Provide a vocabulary list with definitions.
- Permit as much time as needed to finish tests.
- Allow tests to be taken in a room with few distractions (e.g., the library).
- Have test materials read to the student, and allow oral responses.
- Divide tests into small sections of similar questions or problems.
- Allow the student to complete an independent project as an alternative test.
- Allow take-home or open-book tests.
- Show a model of the end product of directions (e.g., a completed math problem or finished quiz).
- Stand near the student when giving directions or presenting a lesson.
- Mark the correct answers rather than the incorrect ones.
- Permit a student to rework missed problems for an additional credit grade.
- Average grades out when assignments are reworked, or grade on corrected work.

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- adjusted class schedules or grading
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits
- occupational or physical therapy

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## At Risk

- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Assistance in maintaining uncluttered space
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
- Peer or scribe note-taking
- Lab and math sheets with highlighted instructions
- Graph paper to assist in organizing or lining up math problems
- Use of manipulatives
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule
- Teach time management skills
- Verbal and visual cues regarding directions and staying on task
- Adjusted assignment timelines
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects
- Preview test procedures
- Cue/model expected behavior
- Use peer supports and mentoring
- Chart progress and maintain data



## **Gifted and Talented**

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- Offer the Most Difficult First
- Pretest for Volunteers
- Offer choice
- Speak to Student Interests
- Allow G/T students to work together
- Tiered learning
- Focus on effort and practice
- Encourage risk taking