Geometry Honors Unit 2: Transformations, Triangles & Congruence (Gr. 9 - 10)

Content Area: **Mathematics**
Course(s): **Geometry Honors**
Time Period: **1st Marking Period**
Length: **8 Weeks**
Status: **Published**

Unit Overview

Through this unit, students will investigate transformations, both in and outside of the coordinate plane. They will develop definitions of various types of transformations, sketch given transformations, and describe the transformations that can be used to map one figure onto another. Building upon this work, students will define and identify the properties of congruent figures. The study of congruent figures will focus on triangles, as students explore and justify different methods that can be used to prove triangles and their corresponding parts congruent. Students will continue their study of triangles as they investigate the properties of triangle inequalities and learn to make conclusions about triangles based on these. Finally, students will learn to identify perpendicular bisecors, angle bisectors, medians and midsegments of triangles, as well as use their properties to solve related problems.

Transfer

Students will be able to independently use their learning to...

- Transform figures in a plane.
- Identify transformations of figures.
- Determine when figures are congruent.
- Use the properties of congruence to reach accurate conclusions.
- Apply geometric properties in solving design problems.

Meaning

Understandings

Students will understand that...

- Geometric relationships and definitions can be used to construct geometric figures and solve real-world problems.
- Isometries are transformations that do not change the size or shape of a figure.
- An object in a plane can be oriented infinitely many different ways while maintaining its size, shape, and original properties.

- Specific instructions can be used to produce a desired image through the manipulation of a given image.
- Knowing the properties of triangles enables us to reach conclusions and solve for unknown measures related to triangles.
- The properties of geometric figures can be proven.
- The properties of special points, segments, and lines related to triangles.

Essential Questions

Students will keep considering...

- How can geometric figures and their properties be described by careful use of geometric language?
- How can a desired image be produced through through the manipulation of a given figure in a plane?
- What relationships exist between the sides and/or angles of a triangle?
- When is it possible to form a triangle with given constraints?
- How can the properties of geometric figures be determined using the coordinate plane?
- How are perpendicular bisectors, angle bisectors, and medians of triangles related?

Application of Knowledge and Skill

Students will know...

- That transformations are functions that take points in the plane as inputs and give other points as outputs.
- The definitions of reflections, rotations, translations, dilations, and symmetry.
- The properties of isometries.
- The classifications and properties of triangles.
- The five basic methods used to prove triangles congruent.
- That corresponding parts of congruent triangles are congruent.
- The properties of perpendicular and angle bisectors.
- The properties of perpendicular bisectors, angle bisectors, medians, and midsegments of triangles.
- The properties of triangle inequalities in one triangle.

Students will be skilled at...

- Drawing specified transformations of figures.
- Specifying a sequence of transformations that will carry a given figure onto another.

- Identifying symmetry in figures.
- Classifying triangles according to their angle measures and side lengths.
- Applying the properties of triangles to solve for unknonws.
- Identifying congruent figures.
- Proving triangles congruent using SSS, SAS & ASA postulates, as well as the AAS & HL theorems.
- Proving that specified corresponding parts of congruent triangles are congruent.
- Applying the properties of perpendicular bisectors and angle bisectors in solving problems.
- Applying the properties of perpendicular bisectors, angle bisectors, medians and midsegments of triangles to solving problems.
- Determining whether or not it is possible to form a triangle with three given side lengths.
- Using properties of triangle inequality to make conclusions about the side lengths and angle measures of given triangles.

Academic Vocabulary

- acute triangle
- altitude of a triangle
- auxiliary line
- base
- base angle
- center of dilation
- centroid of a triangle
- circumcenter of a triangle
- circumscribed
- compositions of transformations
- concurrent
- congruent polygons
- corollary
- corresponding angles
- corresponding sides
- CPCTC
- dilation
- enlargement
- equiangular triangle
- equidistant
- equilateral triangle
- exterior
- exterior angle

- glide reflection
- glide reflection symmetry
- incenter of a triangle
- included angle
- included side
- inscribed
- interior
- interior angle
- isometry
- isosceles triangle
- legs of an isosceles triangle
- line of symmetry
- line symmetry
- median of a triangle
- midsegment of a triangle
- obtuse triangle
- orthocenter of a triangle
- point of concurrency
- reduction
- reflection
- remote interior angles
- right triangle
- rigid transformation
- rotation
- rotational symmetry
- scalene triangle
- symmetry
- transformation
- translation
- translation symmetry
- triangle rigidity
- vertex angle

Learning Goal 2.1

Students will identify the properties of, sketch, and describe transformations.

- Students will identify the properties of, sketch, and describe transformations.

Target 2.1.1 (Level of Difficulty: Retrieval, DOK: 1 - Recall)

SWBAT describe transformations as functions that take points in the plane as inputs and give other points as outputs.

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.K-12.7	Look for and make use of structure.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

Target 2.1.2 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT define (in terms of angles, circles, perpendicular lines, parallel lines, and line segments), identify, draw, and describe the effect of each of the following:

- Reflections
- Translations
- Rotations

MA.K-12.1	Make sense of problems and persevere in solving them.
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.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.K-12.4	Model with mathematics.
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.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.

Target 2.1.3 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT identify and draw compositions of transformations.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.

| 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.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. |

Target 2.1.4 (Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

SWBAT specify a sequence of transformations that will carry a given figure onto another.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
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.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.

Target 2.1.5 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT identify and describe symmetry in geometric figures.

MA.K-12.1	Make sense of problems and persevere in solving them.
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.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.K-12.7	Look for and make use of structure.

Target 2.1.6 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT identify three-dimensional objects generated by rotations of two-dimensional objects.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.7	Look for and make use of structure.
MA.G-GMD.B.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Target 2.1.7 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT identify and draw dilations.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
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.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.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
MA.G-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor:

Target 2.1.8 (Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

SWBAT compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

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.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.7	Look for and make use of structure.

Learning Goal 2.2

SWBAT solve problems involving triangles.

- SWBAT solve problems involving triangles.

Target 2.2.1 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT construct an equilateral triangle.

MA.K-12.1	Make sense of problems and persevere in solving them.
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.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.).

Target 2.2.2 (Level of Difficulty: Retrieval, DOK: 1 - Recall)

SWBAT classify triangles by their angles measures and side lengths.

MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

Target 2.2.3 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT use properties of triangles to solve for unknown measures, including problems involving:

- Interior angles
- Exterior angles
- Isosceles triangles
- Equilateral triangles

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.4	Model with mathematics.
MA.K-12.7	Look for and make use of structure.
MA.G-CO.C.10	Prove theorems about triangles.

Target 2.2.4 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT prove The Triangle Sum Theorem.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.G-CO.C.10	Prove theorems about triangles.

Target 2.2.5 (Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

Students will know and be able to apply triangle inequality theorems:

- If two sides of a triangle are not congruent, then the larger angle is opposite the longer side.
- If two angles of a triangle are not congruent, then the longer side is opposite the larger angle.
- The sum of two side lengths of a triangle must be greater than the third side length.
- The measure of an exterior angle of a triangle is greater than the measure of either of its remote interior

angles.

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-12.7	Look for and make use of structure.
MA.G-CO.C.10	Prove theorems about triangles.

Target 2.2.6 (Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

SWBAT describe and apply the SAS and SSS Triangle Inequality Theorems in comparing measures in two different triangles.

- SWBAT describe and apply the SAS and SSS Triangle Inequality Theorems in comparing measures in two different triangles.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.G-SRT.B.4	Prove theorems about triangles.

Target 2.2.7 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT write indirect proofs to illustrate relationships within triangles, lines, and angles.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.G-CO.C.9	Prove theorems about lines and angles.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.G-CO.C.10	Prove theorems about triangles.

Learning Goal 2.3

Students will be able to understand congruence in terms of rigid motions.

- Students will be able to understand congruence in terms of rigid motions.

Target 2.3.1 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT define congruence in terms of rigid motions and will use this definition to determine whether given figures are congruent.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
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.K-12.6	Attend to precision.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

Target 2.3.2 (Level of Difficulty: Comprehension, DOK: 2 - Skill)

SWBAT show that two figures are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
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.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.

Target 2.3.3 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT justify and use each of the following methods to prove that triangles are congruent:

- SSS Postulate
- SAS Postulate
- ASA Postulate
- AAS Theorem
- HL Theorem

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
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.

Target 2.3.4 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT use CPCTC to prove relationships within congruent triangles.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.

Target 2.3.5 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT prove the slope criteria for parallel and perpendicular lines.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.7	Look for and make use of structure.
MA.G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

Target 2.3.6 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT prove the Isosceles Triangle Theorem and its converse.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.G-CO.C.10	Prove theorems about triangles.

Learning Goal 2.4

Students will be able to state and apply properties of perpendicular bisectors, angle bisectors, medians, and midsegments of triangles.

- Students will be able to state and apply properties of perpendicular bisectors, angle bisectors, medians, and midsegments of triangles.

Target 2.4.1 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT prove and apply theorems about perpendicular bisectors. (Including prove that points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.)

MA.K-12.1	Make sense of problems and persevere in solving them.
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-12.6	Attend to precision.
MA.G-CO.C.9	Prove theorems about lines and angles.
MA.K-12.7	Look for and make use of structure.
MA.G-CO.C.10	Prove theorems about triangles.

Target 2.4.2 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT prove and apply theorems about angle bisectors.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.G-CO.C.9	Prove theorems about lines and angles.
MA.G-CO.C.10	Prove theorems about triangles.

Target 2.4.3(Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

SWBAT identify and apply the properties of perpendicular and angle bisectors of a triangle, including be able to identify the incenter of a triangle and use this to inscribe a circle in the triangle.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
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-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
MA.G-MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Target 2.4.4 (Level of Difficulty: Knowledge Utilization, DOK: 4 - Extended Thinking)

SWBAT identify medians of a triangle, and to prove that the medians of a triangle are concurrent.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.G-CO.C.10	Prove theorems about triangles.
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-MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Target 2.4.5 (Level of Difficulty: Analysis, DOK: 3 - Strategic Thinking)

SWBAT prove and apply theorems about the Triangle Midsegment Theorem.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.7	Look for and make use of structure.
MA.G-CO.C.10	Prove theorems about triangles.

21st Century Life and Careers

WORK.9-12.9.1.12.1	The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time.
WORK.9-12.9.1.12.1	Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency.
WORK.9-12.9.1.12.2	Critical thinking and problem solving in the 21st century are enhanced by the ability to work in cross-cultural teams in face-to-face and virtual environments.
WORK.9-12.9.1.12.2	Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities.
WORK.9-12.9.1.12.A.1	Apply critical thinking and problem-solving strategies during structured learning experiences.
WORK.9-12.9.1.12.F.2	Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.
WORK.9-12.9.3.12.C.6	Develop job readiness skills by participating in structured learning experiences and employment seeking opportunities.

Summative Assessment

- Projects
- Quizzes
- Student Portfolios

- Tests
- Unit 1 Assessment (Common Assessment)

Formative Assessment and Performance Opportunities

- "I have...Who has..." Review Activities
- Academic Games
- Carousel Activities
- Class Discussions
- Classwork
- Closure Activities
- Concept Sorting Activities
- Do Nows
- Exit Tickets
- Four Corners Activities
- Graphic Organizers
- Homework
- Placemat Activities
- Question-All-Writes
- Quiz-Quiz-Trade Activities
- Station Activities
- Student Interviews
- Student Response Systems
- Student Self-Ratings
- Teacher Observation
- Teacher Questioning
- Think, Pair, Share Discussions
- Thumbs Up/Down
- Whip Around
- Whiteboard Use

Differentiation/Enrichment

- 504 Accomodations
- Challenge Problems
- IEP Modifications
- Learning Centers/Stations
- Leveled Practice Opportunities
- Scaffolding Questions

- Small Group Instruction
- Stundent Companion Website Resources
- Technology
- Use of Manipulatives (Paper Strips, Exploragons, etc.)

Unit Resources

- Textbook: Geometry, Common Core Ed. (Holt McDougal, 2012)
- Textbook Resource Kit & Companion Website: https://my.hrw.com/
- Geometer's Sketchpad
- Kuta Software

Additional Websites:

- Dan Meyer's 3-Act Math Tasks: https://docs.google.com/spreadsheet/pub?key=0AjIqyKM9d7ZYdEhtR3BJMmdBWnM2YWxWYVM1UWowTEE&output=htmlG
- Engage NY: Geometry Lesson Notes & Handouts: https://www.engageny.org/resource/high-school-geometry
- Geometry Teacher Mike Patterson's Common Core Teaching Notes: http://www.geometrycommoncore.com/
- Khan Academy: https://www.khanacademy.org/
- NCTM Illuminations Website: Resources for Teaching Math: http://illuminations.nctm.org/Default.aspx
- PARCC Educator Resources: http://www.parcconline.org/for-educators
- The Geometer's Sketchpad Resource Center: http://www.dynamicgeometry.com/