Plainfield Public Schools
Mathematics
Unit Planning Organizer

Grade/Course	Grade 8
Unit of Study	**Unit 3 : Geometry**
Pacing	9 instructional weeks
Date	January 30 – April 4 .2017

Standards for Mathematical Practice
MP1. Make sense of problems and persevere in solving them. **MP2. Reason abstractly and quantitatively.** **MP3. Construct viable arguments and critique the reasoning of others.** **MP4. Model with mathematics.** **MP5. Use appropriate tools strategically.** **MP6. Attend to precision.** **MP7. Look for and make use of structure.** **MP8. Look for and express regularity in repeated reasoning.**

[Hyperlinks are noted underlined in italics]

PPS Mathematics Curriculum Grade 8
NEW JERSEY STUDENT LEARNING STANDARDS

8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:
8.G.A.1.A Lines are transformed to lines, and line segments to line segments of the same length.
8.G.A.1.B Angles are transformed to angles of the same measure.
8.G.A.1.C Parallel lines are transformed to parallel lines.

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.

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two dimensional figures using coordinates.

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, and translations, and dilations; given two similar two-dimensional figures, describes a sequence that exhibits the similarity between them.

8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.

8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system

[Hyperlinks are noted underlined in italics]

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: 8.G.1 Verify experimentally the properties of rotations, reflections, and translations.		
Verify	Rotation, reflection, translation	1

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD 8.G.A.1.A Lines are transformed to lines, and line segments to line segments of the same length.		
(Verify)	Line, line segment	1

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: 8.G.A.1.B Angles are transformed to angles of the same measure.		
(Verify)	Angles of the same measure	1

[Hyperlinks are noted underlined in italics]

PPS Mathematics Curriculum Grade 8

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD **8.G.A.1.C Parallel lines are transformed to parallel lines.**		
(Verify)	Parallel line	1

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: **8.G.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.**		
Understand	congruent , rotations, reflections, and translations;	1

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: **8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two dimensional figures using coordinates.**		
Describe	dilations, translations, rotations, and reflection, coordinates	1

[Hyperlinks are noted underlined in italics]

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: **8.G.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, and translations, and dilations; given two similar two-dimensional figures, describes a sequence that exhibits the similarity between them.**		
Understand	rotations, reflections, and translations, and dilations;	1

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD: **8.G.5 Use to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.**		
Use	the angle sum , exterior angle of triangles, parallel lines ,a transversal, and the angle-angle criterion for similarity of triangles.	2

[Hyperlinks are noted underlined in italics]

"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD **8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse**		
Explain	Pythagorean Theorem	1

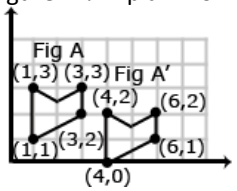
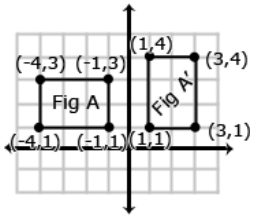
"Unwrapped" Skills (students need to be able to do)	"Unwrapped" Concepts (students need to know)	DOK Levels
FOCUS STANDARD **8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions**		
Apply	Pythagorean Theorem	2

[Hyperlinks are noted underlined in italics]

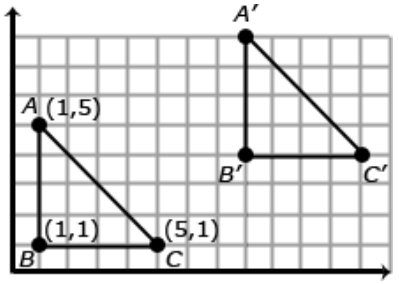
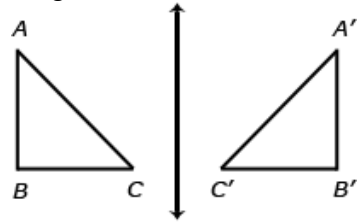
II. New Jersey Student Learning Standards and Mathematical Practices ..Explanations and Examples

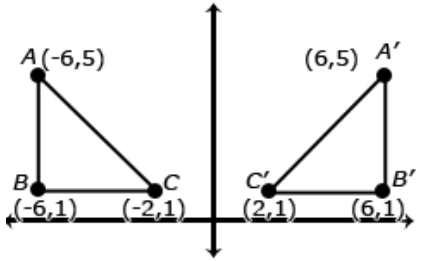
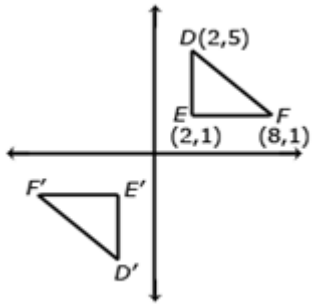
Geometry (G) **Understand congruence and similarity using physical models, transparencies, or geometry software.**		
Standards *Students are expected to:*	*Mathematical Practices*	*Explanations and Examples*
8.G.A.1. Verify experimentally the properties of rotations, reflections, and translations: a. Lines are transformed to lines, and line segments to line segments of the same length. b. Angles are transformed to angles of the same measure. c. Parallel lines are tranformed to parallel lines.	*8.MP.4.* Model with mathematics. *8.MP.5.* Use appropriate tools strategically. *8.MP.6.* Attend to precision. *8.MP.7.* Look for and make use of structure. *8.MP.8.* Look for and express regularity in repeated reasoning.	Students need multiple opportunities to explore the transformation of figures so that they can appreciate that points stay the same distance apart and lines stay at the same angle after they have been rotated, reflected, and/or translated. Students are not expected to work formally with properties of dilations until high school.

[Hyperlinks are noted underlined in italics]

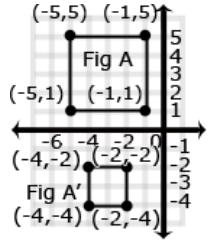
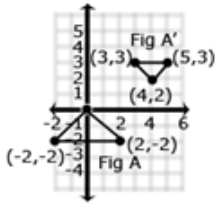
8.G.A.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	*8.MP.2.* Reason abstractly and quantitatively. *8.MP.4.* Model with mathematics. *8.MP.6.* Attend to precision. *8.MP.7.* Look for and make use of structure.	**Examples**: ● Is Figure A congruent to Figure A'? Explain how you know.  ● Describe the sequence of transformations that results in the transformation of Figure A to Figure A'. 
Geometry (G) **Understand congruence and similarity using physical models, transparencies, or geometry software.**		
Standards ***Students are expected to:***	*Mathematical Practices*	*Explanations and Examples*

[Hyperlinks are noted underlined in italics]

8.G.A.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	*8.MP.3.* Construct viable arguments and critique the reasoning of others. *8.MP.4.* Model with mathematics. *8.MP.5.* Use appropriate tools strategically. *8.MP.6.* Attend to precision. *8.MP.7.* Look for and make use of structure.	Dilation: A dilation is a transformation that moves each point along a ray emanating from a fixed center, and multiplies distances from the center by a common scale factor. In dilated figures, the dilated figure is *similar* to its pre-image. Translation: A translation is a transformation of an object that moves the object so that every point of the object moves in the same direction as well as the same distance. In a translation, the translated object is *congruent* to its pre-image. • $\triangle ABC$ has been translated 7 units to the right and 3 units up. To get from A (1,5) to A' (8,8), move A 7 units to the right (from $x = 1$ to $x = 8$) and 3 units up (from $y = 5$ to $y = 8$). Points B + C also move in the same direction (7 units to the right and 3 units up).  Reflection: A reflection is a transformation that flips an object across a line of reflection (in a coordinate grid the line of reflection may be the x or y axis). In a rotation, the rotated object is *congruent* to its pre-image.  $\triangle ABC \cong \triangle A'B'C'$ When an object is reflected across the y axis, the reflected x coordinate is the opposite of

		the pre-image x coordinate.  Rotation: A rotated figure is a figure that has been turned about a fixed point. This is called the center of rotation. A figure can be rotated up to 360˚. Rotated figures are *congruent* to their pre-image figures. ● Consider when ΔDEF is rotated 180˚ clockwise about the origin. The coordinates of ΔDEF are D(2,5), E(2,1), and F(8,1). When rotated 180˚, $\Delta D'E'F'$ has new coordinates D'(-2,-5), E'(-2,-1) and F'(-8,-1). Each coordinate is the opposite of its pre-image. 

[Hyperlinks are noted underlined in italics]

Geometry (G) **Understand congruence and similarity using physical models, transparencies, or geometry software.**		
Standards *Students are expected to:*	*Mathematical Practices*	*Explanations and Examples*
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.	*8.MP.2.* Reason abstractly and quantitatively. *8.MP.4.* Model with mathematics. *8.MP.5.* Use appropriate tools strategically. *8.MP.6.* Attend to precision. *8.MP.7.* Look for and make use of structure.	**Examples**: ● Is Figure A similar to Figure A'? Explain how you know.  ● Describe the sequence of transformations that results in the transformation of Figure A to Figure A'. 

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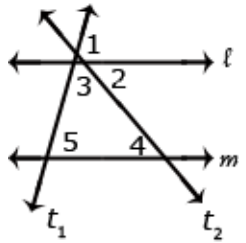
Geometry (G) **Understand congruence and similarity using physical models, transparencies, or geometry software.**		
Standards *Students are expected to:*	*Mathematical Practices*	*Explanations and Examples*
8.G.A.5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	*8.MP.3.* Construct viable arguments and critique the reasoning of others. *8.MP.4.* Model with mathematics. *8.MP.5.* Use appropriate tools strategically. *8.MP.6.* Attend to precision. *8.MP.7.* Look for and make use of structure.	Students can informally prove relationships with transversals. **Example**: ● Show that m $\angle 3$ + *m* $\angle 4$ + *m* $\angle 5$ = 180˚ if l and *m* are parallel lines and t_1 & t_2 are transversals. $\angle 1 + \angle 2 + \angle 3 = 180^\circ$. Angle 1 and Angle 5 are congruent because they are corresponding angles ($\angle 5 \cong \angle 1$). $\angle 1$ can be substituted for $\angle 5$. $\angle 4 \cong \angle 2$ because alternate interior angles are congruent. $\angle 4$ can be substituted for $\angle 2$. Therefore *m* $\angle 3$ + *m* $\angle 4$ + *m* $\angle 5$ = 180˚  Students can informally conclude that the sum of a triangle is 180º (the angle-sum theorem) by applying their understanding of lines and alternate interior angles. **Examples**: ● In the figure below, line x is parallel to line *yz*:

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		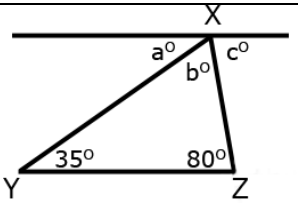 $\overline{X} \parallel \overline{YZ}$ • Angle *a* is 35 ° because it alternates with the angle inside the triangle that measures 35 °. Angle *c* is 80 ° because it alternates with the angle inside the triangle that measures 80 °. Because lines have a measure of 180 °, and angles *a + b + c* form a straight line, then angle *b* must be 65 ° (180 – 35 + 80 = 65). Therefore, the sum of the angles of the triangle are 35 ° + 65 ° + 80 °.

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III. Unit Vocabulary

Unit Vocabulary Terms			
Exterior angle Parallel lines perpendicular Rotation Reflection Translation Dilation Congruent Transversal Angle – angle criterion	Line segment Angle sum Congruency Vertical angles Triangle Sum Theorems Supplemental angle	Triangle Isosceles Equilateral Scalene Coordinates Perpendicular line Obtuse angle Obtuse triangle	Acute triangle Obtuse triangle Right triangle Square root Cube root Terminating decimal Repeating decimal Real number Rational number Irrational number Pythagorean Theorem theorem Hypotenuse leg

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V. Essential Questions ……..Corresponding Big Ideas

Essential Questions	Corresponding Big Ideas
What effects does length and angle measurement have on triangles? . How do shapes change after each transformation? How are they the same? How do you manipulate a figure on the coordinate plane? What are some examples from the real world of transformational geometry? Given the pre-image, how can you determine what transformation has taken place? What kinds of patterns/designs can be created through multiple transformations?	Decomposing and rearranging provide a geometric way of both seeing that a measurement formula is the right one and seeing why it is the right one. In addition to decomposing and rearranging, shearing provides another geometric way of both seeing that a measurement formula is the right one and seeing why it is the right one. Geometric images provide the content in relation to which properties can be noticed, definitions can be made, and invariances can be discerned. Symmetry provides a powerful way of working geometrically. Geometric awareness develops through practice in visualizing, diagramming and constructing. Tools provide new sources of imagery as well as specific ways of thinking about geometric objects and processes. Geometric thinking turns tools into objects. and in geometry the process of turning an action undertaken with a tool into an object happens over and over again. Naming is not just about nomenclature: it draws attention to properties and objects of geometric interest.

[Hyperlinks are noted underlined in italics]

	Definition can both generate and reflect structure: definitions are often dependent on a specific classification. Conjectures emerge out of a problem-posing process that generates claims that need to be justified. Zbiek, Mary Rose. (2010). Developing essential understanding of Geometry teaching mathematics in grades 6-8 . Reston, VA: The National Council of Teachers of Mathematics, Inc. .

[Hyperlinks are noted underlined in italics]

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VI. Student Learning Objectives

LEARNING OBJECTIVES	**Concepts/Skills**	***PARCC Instructional Math Test Specification***	**Mathematical Practices**
Evaluate square roots and cubic roots of small perfect squares and cubes respectively and use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ where p is a positive rational number; identify $\sqrt{2}$ as irrational. 8.EE.A.2. Apply the formula for the volume of a cone a cylinder, or a sphere to find a single unknown dimension when solving real-world and mathematical problems. 8.G.C.9	**Concept(s):** • Square root and cube roots; perfect squares and perfect cubes • Inverse relationship between powers and square roots **Students are able to:** • give the value of square roots of small perfect squares. • solve equations of the form $x^2 = p$, where p is a positive rational number. • use the square root symbol to represent solutions to equations of the form $x^2 = p$. • give the value of cube roots of small perfect cubes. • solve equations of the form $x^3 = p$, where p is a positive rational number.	• Tasks may or may not have a context. • Students are not required to simplify expressions such as $\sqrt{8}$ to $2\sqrt{2}$. • Students are required to express the square roots of 1, 4, 9, 16, 25, 36, 49, 64, 81 and 100; and the cube roots of 1, 8, 27, and 64.	MP. 2 MP. 3 MP. 5 MP. 6 MP. 7

[Hyperlinks are noted underlined in italics]

	• use the cube root symbol to represent solutions to equations of the form $x^3 = p$. • show or explain that $\sqrt{2}$ is an irrational number. • use volume formulas to find a single unknown dimension of cones, cylinders and spheres when solving real world problems.		
Explain a proof of the Pythagorean Theorem and its converse8.G.B.6	**Concept(s):** • Pythagorean Theorem • If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle (Pythagorean theorem converse). **Students are able to:** • given a proof of the Pythagorean theorem, explain the proof. given a proof of the converse of the Pythagorean theorem, explain the proof		MP. 1 MP. 2 MP. 3 MP. 4 MP. 5 MP. 7

[Hyperlinks are noted underlined in italics]

Apply the Pythagorean Theorem to determine unknown side lengths of right triangles in two and three dimensional cases when solving real-world and mathematical problems. 8.G.B.7.	**Concept(s):** No new concept(s) introduced **Students are able to:** • determine side lengths of right triangles by applying the Pythagorean Theorem to solve real world and mathematical problems involving two dimensional spaces. • determine side lengths of right triangles by applying the Pythagorean Theorem to solve real world and mathematical problems involving three dimensional spaces	• Tasks have "thin context" 2 or no context. • An equal number of tasks require the answer to be given as a whole number or as an irrational number written to approximately three decimal places. •	MP.2 MP.7
Use the Pythagorean Theorem to determine the distance between two points in the coordinate plane. 8.G.B.8.	**Concept(s**): No new concept(s) introduced **Students are able to:** • determine the distance between two points in a coordinate plane by drawing a right triangle and applying the Pythagorean Theorem	Some of tasks require students to use the converse of the Pythagorean Theorem.	MP.2 MP.3 MP.5
Explain and model the properties of	**Concept(s):**	Tasks do not have a context.	MP.3

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rotations, reflections, and translations with physical representations and/or geometry software using pre-images and resultant images of lines, line segments, and angles. 8.G.A.1, 8.G.A.1a, 8.G.A.1b, 8.G.A.1c	• A property of rigid motion transformations (rotation, reflection, and translation) is that the measure of a two-dimensional object under the transformation remains unchanged. **Students are able to**: • show and explain that performing rotations, reflections, and translations on lines results in a line. • show and explain that performing rotations, reflections, and translations on line segments results in a line segment and does not alter the length of the line segment. • show and explain that performing rotations, reflections, and translations on angles results in an angle and does not alter the measure of the angle. • show and explain that performing rotations, reflections, and translations on parallel lines results in parallel lines.		MP.5 MP.8

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	• explain that a property of rigid motion transformations (rotation, reflection, and translation) is that the measure of a two-dimensional object under the transformation remains unchanged		
Describe and perform a sequence of rotations, reflections, and/or translations on a two dimensional figure in order to prove that two figures are congruent. 8.G.A.2	**Concept(s):** • 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. **Students are able to**: • given two congruent figures, describe a transformation or sequence of transformations that shows the congruence between them.	• Tasks do not have a context • Figures may be drawn in the coordinate plane, but do not include the use of coordinates. • Tasks require students to make connections between congruence and transformations.	MP.2 MP.7.
Use the coordinate plane to locate images or pre-images of two-dimensional figures and determine the coordinates of a resultant image after applying dilations, rotations, reflections, and translations. 8.G.A.3	**Concept(s**): No new concept(s) introduced **Students are able to**: • describe, using coordinates, the resulting two-dimensional figure after applying dilations with scale factor greater than, less	• Tasks have "thin context" or no context. • Tasks require the use of coordinates in the coordinate plane. For items involving dilations, tasks must state the center of dilation. Centers of	MP.2 MP.3 MP.5

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	than, and equal to 1. • describe, using coordinates, the resulting two-dimensional figure after applying translation, rotation, and reflection.	dilation can be the origin, the center of the original shape or the vertices of the original shape.	
Use the coordinate plane to locate images or pre-images of two-dimensional figures and determine the coordinates of a resultant image after applying dilations, rotations, reflections, and translations8.G.A.3	**Concept(s**): No new concept(s) introduced **Students are able to:** • describe, using coordinates, the resulting two-dimensional figure after applying dilations with scale factor greater than, less than, and equal to 1. • describe, using coordinates, the resulting two-dimensional figure after applying translation, rotation, and reflection.	•	MP.2. MP.3 MP.5
Apply an effective sequence of transformations to determine that figures are similar when corresponding angles are congruent and corresponding sides are proportional. Write similarity statements based on such transformations. 8.G.A.5	**Concept(s):** • 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. • Congruent figures are also	• Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. • Tasks do not have a context. • Figures may be drawn in the coordinate plane, but do not	MP.2. MP.3 MP.5

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	similar. **Students are able to:** • describe a transformation or sequence of transformations that show the similarity between them given two similar two-dimensional figures.	include the use of coordinates. • Tasks require students to make connections between similarity and transformations.	
Give informal arguments to justify facts about the exterior angles of a triangle, the sum of the measures of the interior angles of a triangle, the angle-angle relationship used to determine similar triangles, and the angles created when parallel lines are cut by a transversal. 8.G.A.5	**Concept(s**): No new concept(s) introduced **Students are able to:** • give informal arguments to establish facts about the angle sum of triangles. • give informal arguments to establish facts about exterior angles of triangles. • give informal arguments to establish facts about the angles created when parallel lines are cut by a transversal. • give informal arguments to establish the angle-angle criterion for similarity of triangles.	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures	MP.3 MP.5 MP.6

[Hyperlinks are noted underlined in italics]

VI . Differentiations / Modifications Teaching Strategies

Research Based Effective Teaching Strategies	Modifications (how do I differentiate instruction?)	Special Education	Strategies for English Language Learners
Task /Activities that solidifies mathematical concepts Use questioning techniques to facilitate learning Reinforcing Effort, Providing Recognition Practice, reinforce and connect to other ideas within mathematics Promotes linguistic and nonlinguistic representations Cooperative Learning Setting Objectives, Providing Feedback Varied opportunities for students to communicate mathematically Use technological and /or physical tools	**Modifications** Before or after school tutorial program Leveled rubrics Increased intervention Small groups Change in pace Calculators Extended time Alternative assessments Tiered activities/products Color coded notes Use of movements Use any form of technology *Using technology, student place polygon shape on coordinate grid. Students moves, observes and reflects upon the following:* 1. *4 units' right* 2. *3 units left and 1-unit up* 3. *2 units right and 5-unit down* *Discuss the value of using* multiple transformations to move	Change in pace Calculators Alternative assessments Accommodations as per IEP Modifications as per IEP Use graphic organizer to clarify mathematical functions for students with processing and organizing difficulties'. Constant review of math concepts to strengthen understanding of prior concepts for difficulties recalling facts. Use self-regulations strategies for student to monitor and assess their thinking and performance for difficultly attending to task Cooperative learning (small group, teaming, peer assisted tutoring) to foster communication and strengthen confidence.	*Whiteboards* *Small Group / Triads* *Word Walls* *Partially Completed Solution* *Gestures* *Native Language Supports* *Pictures / Photos* *Partner Work* *Work Banks* *Teacher Modeling* *Math Journals* *When reflecting a figure display in a table the vertices of pre image, distance from axis and vertices of post image* *See Connected Mathematics Program 3 for Classroom Differentiation for English Language Learners*

[Hyperlinks are noted underlined in italics]

21st Century Learning Skills : Teamwork and Collaboration Initiative and Leadership Curiosity and Imagination Innovation and Creativity Critical thinking and Problem Solving Flexibility and Adaptability Effective Oral and Written Communication Accessing and Analyzing Information	from one location to another. Have students explore using multiple transformations. **Extension:** . *Students log and register onto https://calculationnation.nctm.org/ to play game Flip-n-Slide.Have two students compete against each other. After each move, the player who did not move should describe the path of the other player's triangle. The player who is moving should write down his path, and the player who is trying to guess should either dictate the path to the first player or write it down. The players can compare their paths to see if they match.* *Students can create creative pieces to help them remember the rules of transformations (ex: short story, song, poem, etc.).* *Give students two consecutive transformations. Then, have students try to find one transformation that gives the same result. They can create a record to*	Use technology and/or hands on devices to: clarify abstract concepts and process for: 1. Difficulty interpreting pictures and diagram. 2.difficulties with oral communications 3. Difficulty correctly identifying symbols of numeral 4.Difficulty maintaining attentions Simplify and reduces strategies / Goal structure to enhance motivation, foster independence and self-direction for: 1.Difficulty attending to task 2. Difficulty with following a sequence of steps to solution. 3.Difficulty processing and organizing Scaffolding math idea/concepts by guided practice and questioning strategies' to clarify and enhance understanding of math big ideas for: 1.Difficulty with process and organization 2.difficulty with oral and written communication	

[Hyperlinks are noted underlined in italics]

	see if there are any patterns of which transformations will and won't work. *See Connected Mathematics Program 3 Classroom Differentiation for Gifted Students*	Teacher models strategies' and think out aloud strategies to specify step by step process for: 1.Difficulties processing and organization 2. Difficulty attending to tasks. Use bold numbers and/or words to draw students' attention to important information. See Connected Mathematics Program 3 Classroom Differentiation for Special Needs Students	

[Hyperlinks are noted underlined in italics]

VII. Instructional Resources and Materials

<table>
<tr><th colspan="3">Instructional Resources and Materials</th></tr>
<tr><th>Formative Assessment</th><th colspan="2">Print</th></tr>
<tr><td rowspan="3">Short constructed responses
Extended responses
Checks for Understanding
Exit tickets
Teacher observation
Projects
Timed Practice Test – Multiple Choice & Open-Ended Questions

<u>Performance Tasks</u>

<u>8.G.B.8 Finding isosceles triangles</u>

<u>Additional Performance Tasks</u>

<u>8.G.B.6 Converse of the Pythagorean Theorem</u>
<u>8.G.B.7 Running on the Football Field</u>
<u>8.G.A.1 Reflections, Rotations, and Translations</u>
<u>8.G.A.2 Congruent Triangles</u>
<u>8.G.A.3 Effects of Dilations on Length, Area, and Angles</u>
<u>8.G.A.4 Are They Similar</u>
<u>8.G.A.5 Street Intersections</u>
<u>8.G.A.5 Similar Triangles II</u>
<u>8.G.A.5 Triangle's Interior Angles</u></td><td colspan="2">Connected Math Program 3 Grade 8 Unit: Butterflies, Pinwheels and Wallpaper: Symmetry and Transformation
<u>Connected Math Program Scope and Sequence for Grade 8</u></td></tr>
<tr><td colspan="2">Additional Print and Technology Resources</td></tr>
<tr><td>Resources for teachers
<u>Connected Math Project (Michigan State University)</u>
<u>My Pearson Training : Connected Math Program</u>
<u>Annenberg Learning : Insight into Algebra 1</u>
<u>Mathematics Assessment Projects</u>
<u>Get the Math</u>
<u>Achieve the Core</u>
<u>Webmath.com</u>
<u>Interactive Mathematics.com</u>
<u>Illustrative Mathematics</u>
<u>Inside Mathmatics.org</u>
<u>Asia Pacific Economic Cooperation : :Lesson Study Videos</u>
<u>Genderchip.org</u>
<u>Interactive Geometry</u>
<u>Mathematical Association of America</u>
<u>National Council of Teachers of Mathematics</u>
<u>learner.org</u>
<u>Math Forum : Teacher Place</u>
<u>Shmoop /common core math</u></td><td>Resources for Students
<u>My Math Universe.com</u>
<u>Math is Fun website</u>
<u>Khan Academy</u>
<u>Figure This.org website</u>
<u>Virtual Nerd website</u>
<u>Math Snacks websites</u>

<u>Internet 4 Classroom website</u>
<u>A Maths Dictionary for kids</u></td></tr>
</table>

[Hyperlinks are noted underlined in italics]

Summative Assessment: **End of year Assessment for Grade 8**		

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[Hyperlinks are noted underlined in italics]