Common Core Geometry

Saugerties Central School District

A comprehensive document for the High School Geometry scope and sequence.

SCSD
9/1/2015

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and prophecies with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x^2 + x + 1)$, and $(x – 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Common Core Geometry Timeline

Unit 1 Congruence with Transformations			
# of Weeks	Topic	CCSS Addressed	Resources
2	Undefined Terms Introductory Definitions Basic Constructions	G.CO.1 G.CO.1 G.CO.12 G.CO.13	www.geometrycommoncore.com (By Mike Patterson) Supplemented by Prentice Hall Geometry
1	Isometry (Rigid Motions) Mapping Functions Symmetry	G.CO.2 G.CO.2 G.CO.3	
2	Transformations (Reflection, Rotation, Translation, Composite Transformations)	G.CO.4 G.CO.5	
2	Composite Transformations Proofs (Lines/Angles) (Congruence)	G.CO.5 G.CO.6 G.CO.7 G.CO.9	
2	Congruence Criteria Proof (Triangles)	G.CO.8 G.CO.10	
1	Proof (Quadrilaterals)	G.CO.11	
Total Number of Weeks: 10			

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Unit 2 Similarity			
# of Weeks	Topic	CCSS Addressed	Resources
2	Dilation Dilation Properties	G.SRT.1 G.SRT.2	www.geometrycommoncore.com (By Mike Patterson) Supplemented by Prentice Hall Geometry
1	Similarity Similarity Proof	G.SRT.3 G.SRT.4	
1	Geometric Mean Special Right Triangles	G.SRT.5	
1	Trigonometry Sine/Cosine Relationships	G.SRT.6 G.SRT.7	
1	Trigonometry Applied Problems	G.SRT.8	
1	Area Formula Law of Sines Law of Cosines	G.SRT.9 G.SRT.10	
Total Number of Weeks: 6/7			

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Unit 3 Measurement and Volume			
# of Weeks	Topic	CCSS Addressed	Resources
2	Developing Formulas Calculating Area	G.GMD.1	www.geometrycommoncore.com (By Mike Patterson) Supplemented by Prentice Hall Geometry
2	Developing Formulas Calculating Volume	G.GMD.1 G.GMD.3	
1	Cross Sections Rotating Volume	G.GMD.4	
Total Number of Weeks: 5			

Unit 5 Circles			
# of Weeks	Topic	CCSS Addressed	Resources
1	Circle Similarity Circle Properties	G.C.1 G.C.2	www.geometrycommoncore.com (By Mike Patterson) Supplemented by Prentice Hall Geometry
1	Circle Properties	G.C.2	
1	Circle Properties Circle Constructions	G.C.2 G.C.3	
1	Circle Constructions Radian Measure Tangent Line Construction	G.C.3 G.C.5 G.C.4	
1	Radian Measure	G.C.5	
Total Number of Weeks: 5			

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Unit 4 Equations			
# of Weeks	Topic	CCSS Addressed	Resources
1	Circle Equations	G.GPE.1	www.geometrycommoncore.com (By Mike Patterson) Supplemented by Prentice Hall Geometry
1	Coordinate Problems	G.GPE.4	
1	Parallel/Perpendicular lines Partitioning Segment	G.GPE.5 G.GPE.6	
1	Partitioning Segment Perimeter and Area	G.GPE.6 G.GPE.7	
Total Number of Weeks: 4			

Unit 6 Apply Geometric Concepts in Modeling Situations			
# of Weeks	Topic	CCSS Addressed	Resources
2	Modeling with Geometry	G.MG.1 G.MG.2 G.MG.3	Supplemented by Prentice Hall Geometry www.illustrativemathematics.com Examples: 397, 416, 1439
Total Number of Weeks: 2			

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Unit 1 Congruence with Transformations	Geometry	Approx. 50 days	SCD Math 8/01/15

Domain(s):

CO—Congruence, Proof, and Constructions

Essential Question(s):

- What three essential building blocks are used to create all geometrical objects and relationships?
- How can isometries be used to show congruence and similarities from a transformational stand point?
- What makes a mathematical conjecture viable?
- Is there only one type of geometry?
- What real life situations mimic geometric "proof"?

Cluster(s):

Experiment with transformations in the plane

- *G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment based on the undefined notions of point, line, distance along a line, and distance around a circular arc.*
- *G.CO.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)*

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

- *G.CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.*
- *G.CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.*
- *G.CO.5 Given a geometric figure and a rotations, 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.*

Understand congruence in terms of rigid motions

- *G.CO.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.*
- *G.CO.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.*
- *G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.*

Prove geometric theorems

- *G.CO.9 Prove (and apply) theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*
- *G.CO.10 Prove (and apply) theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*

- *G.CO.11 Prove (and apply) theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*

Make geometric constructions

- *G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*

- *G.CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.*

Essential Skills	Vocabulary	District Resources
• Define any geometric term using words, diagrams and notation • Transform geometric figures using rotation, reflection, translation, dilation • Construct geometric figures using appropriate tools and methods (such as copying and bisecting) • Justify transformations using precise language to include isometries and figure orientation • Apply understandings of transformations to make conjectures and prove theorems through articulate arguments	• Alternate exterior angles • Alternate interior angles • Angle • Base angle • Bisect • Center point • Circle • Circular arc • Clockwise • Congruence • Congruent • Corresponding • Counter-clockwise • Distance • Endpoints • Equidistant	www.geometrycommoncore.com Unit 1 by Mike Patterson Supplementary materials by Prentice Hall Geometry textbook

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

	• Isometry • Line • Line of reflection • Line segment • Median • Midpoint • Parallel line • Parallelogram • Perpendicular bisector • Perpendicular line • Point • Rectangle • Reflection • Regular polygon • Rigid motion • Rotation • Transformation • Translation • Transversal • Trapezoid • Triangle congruencies (ASA, SAS, SSS, SAA, HL) • Types of triangles (isosceles, equilateral, scalene, equiangular, acute, obtuse, right) • Vertex angle • Vertical angles	

Unit 2 **Similarity**	Geometry	Approx. 30 days	SCD Math 8/01/15

Domain(s):

SRT—Similarity, Right Triangles, and Trigonometry

Essential Question(s):

- Do all translations preserve properties of geometric figures?
- Is vocabulary important when communicating about geometric transformation?
- How do you identify and apply theorems in order to solve problems?
- Is modeling the only way to justify the conclusion to a geometric conjecture?

Cluster(s):

Understand similarity in terms of similarity transformations

- *G.SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor.*
  - *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.*
  - *The dilation of a line segment is longer or shorter in the ratio given by the scale factor.*
- *G.SRT.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.*
- *G.SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.*

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Prove theorems involving similarity

- *G.SRT.4 Prove (and apply) theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*
- *G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.*

Define trigonometric ratios and solve problems involving right triangles

- *G.SRT.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.*
- *G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.*
- *G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*

Apply trigonometry to general triangles

- *G.SRT.9 (+Precalc) Derive the formula* $A = \frac{1}{2}ab\sin C$ *for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.*
- *G.SRT.10 (+Precalc) Prove the Laws of Sines and Cosines and use them to solve problems.*
- *G.SRT.11 (+Precalc) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).*

Essential Skills	Vocabulary	District Resources
• Use transformations to show correspondence, similarity, and/or congruence of geometric figures • Use specific triangle congruencies to justify a solution to a word problem or to prove a modeled relationship • Determine which trigonometric ratios can be used to find unknown measurements of sides and angles in right triangles	• Area • Center • Complementary angles • Congruence • Corresponding • Cosine • Dilation • Proportionality	www.geometrycommoncore.com Unit 2 by Mike Patterson Supplementary materials by Prentice Hall Geometry textbook

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

• Explain which trigonometric ratio is appropriate to apply in a given situation • Apply trigonometric ratios and the Pythagorean theorem to solve problems posed from real life scenarios	• Pythagorean theorem • Ratio • Scale factor • Similarity • Sine • Tangent • Trigonometric ratios	

Unit 3 Measurement and Volume	Geometry	Approx. 25 days	SCD Math 8/01/15

Domain(s):

GMD—Geometric Measurement and Dimension

Essential Question(s):

- How can a correct geometric formula be derived?
- What effect does a change in dimension have on geometric figures?

Cluster(s):

Explain volume formulas and use them to solve problems

- *G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments: Cavalieri's principle, and informal limit arguments.*
- *G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

Visualize the relation between two-dimensional and three-dimensional objects.

- *G.GMD.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.*

Essential Skills	Vocabulary	District Resources
• Communicate understanding of the formulas for circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone	• Area • Cavalieri's Principle • Circumference	www.geometrycommoncore.com Unit 3 by Mike Patterson

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

• Calculate area and volume using appropriate formulas for two-dimensional and three-dimensional figures • Explore and draw conclusions based on cross-sections of three-dimensional figures • Identify the outcomes formed by the rotation of a two-dimensional figure	• Cone • Cross-section • Cylinder • Pyramid • Rotation • Sphere • Three-dimensional • Two-dimensional • Volume	Supplementary materials by Prentice Hall Geometry textbook

Unit 4 Equations	Geometry	Approx. 20 days	SCD Math 8/01/15

Domain(s):

GPE—Expressing Geometric Properties with Equations

Essential Question(s):

- **Will modeling using the coordinate plane help mathematical reasoning?**
- **How can two-dimensional modeling be connected to three-dimensional figures?**

Cluster(s):

Translate between the geometric description and the equation for a conic section.

- *G.GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.*

Use coordinates to prove simple geometric theorems algebraically.

- *G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, $\sqrt{3}$) lies on the circle centered at the origin and containing the point (0,2).*
- *G.GPE.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).*
- *G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.*

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

- *G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*

Essential Skills	Vocabulary	District Resources
• Use coordinate geometry in conjecture and reasoning to provide conclusions to a simple proof • Apply prior formulas of slope, distance, and midpoint to further investigate proportional reasoning • Use the coordinate plane to model specific geometric figures • Compute area and perimeter of polygons from given coordinates	• Coordinate • Directed line segment • Distance formula • Midpoint formula • Parallel lines • Partition • Perimeter • Perpendicular lines • Polygon • Ratio • Rectangle • Slope • Theorem • Triangle	www.geometrycommoncore.com Unit 4 by Mike Patterson Supplementary materials by Prentice Hall Geometry textbook

Unit 5 Circles	Geometry	Approx. 20 days	SCD Math 8/01/15

Domain(s):

C—Circles

Essential Question(s):

- **How do the properties of a circle define its physical construction?**

Cluster(s):

Understand and apply theorems about circles.

- *G.C.1 Prove that all circles are similar.*
- *G.C.2 Identify and describe relationships among inscribed angles, radii, and chords, include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*
- *G.C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.*
- *G.C.4 (+ Precalc) Construct a tangent line from a point outside a given circle to the circle.*

Find arc lengths and areas of sectors of circles.

- *G.C.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.*

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Essential Skills	Vocabulary	District Resources
• Understand and demonstrate that the ratio between the circumference and diameter in any given circle is pi • Construct inscribed and circumscribed circles of a given geometric shape • Given the radius and center of a circle, use the Pythagorean theorem and completing the square to derive the equation of a circle • Explore circle similarity to understand and derive the proportional relationship between the arc length and radius • Be able to communicate relationships among inscribed angles, radii, and chords	• Arc • Central angle • Chord • Circumscribed angle • Completing the square • Constant of proportionality • Degree • Diameter • Inscribed angle • Pythagorean theorem • Radian • Radii • Secant • Sector • Similar • Tangent	www.geometrycommoncore.com Unit 5 by Mike Patterson Supplementary materials by Prentice Hall Geometry textbook

Major Clusters (70%) Supporting Clusters (20%) Additional Clusters (10%) Honors Clusters (enrichment)

Unit 6 Apply Geometric Concepts in Modeling Situations	Geometry	Approx. 10 days	SCD Math 8/01/15

Domain(s):

MG—Modeling with Geometry

Essential Question(s):

- How can the properties of geometric figures be used to describe objects in real life situations?
- How can we adjust geometric measurements to solve design problems?

Cluster(s):

Apply geometric concepts in modeling situations

- *G.MG.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)*
- *G.MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot.)*
- *G.MG.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).*

Essential Skills	Vocabulary	District Resources
• Make real life connections using geometric shapes, their measures, and their properties • Apply concepts of density to model situations based on area and volume • Be able to collaborate to form a conjecture based on appropriate geometric methods used to solve real world design problems	• Area • Density • Volume	Supplementary materials by Prentice Hall Geometry textbook www.illustrativemathematics.com Examples: 397, 416, 1439