Standard - New Jersey Student Learning Standards: G-GMA
Geometry (Chapter 8)

Strand

G-CO: Geometry: Congruence

Experiment with transformations in the plane.

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

Understand congruence in terms of rigid motions.

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-SRT: Geometry: Similarity, Right Triangles, & Trigonometry

Understand similarity in terms of similarity transformations.

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.

G-GMA: Geometric Measurement and Dimension

Explain volume formulas and use them to solve problems.

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.
2. (+) Give an informal argument using Cavalier's principle for the formulas for the volume of a sphere and other solid figures.
3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

Visualize relationships between two-dimensional and three-dimensional objects

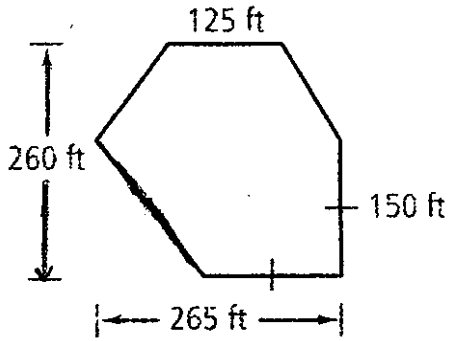
4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotation of two-dimensional objects.

Curriculum aligned with: 2009 New Jersey Core Curriculum Content Standards for 21st Century Skills (9.1 A-F)

21st Century Theme: *Global Awareness* x*,Financial, economic, business and entrepreneurial literacy* ☐*,Civic literacy* ☐*,Health literacy* ☐*Environmental Literacy* ☐

21st Century Skills: *Critical Thinking & Problem Solving* ☐*,Creativity and Innovation* ☐*,Collaboration, Teamwork and Leadership* ☐*,Cross-Cultural Understanding and Interpersonal Communications X Communication and Media Fluency* ☐*,Accountability, Productivity and Ethics*

Interdisciplinary Connection: Math=MA, English=ELA, Science=SCI, Social Studies=SS, Physical Education=PE, Art=ART, Music=MU, Technology=TECH, World Language=WL, Business = BU

Essential Questions	Enduring Understandings	Activities, Investigation, and Student Experiences
1. How do you find the area of a polygon? 2. How do you find the circumference and area of a circle? 3. How do perimeters and areas of similar polygons compare? 4. How can you change a figure's position without changing its size and shape? 5. How can you change a figure's size without changing its shape?	*Students will understand….* • Points, Lines, Planes and Angles • Polygons • Perimeter and Area • Volume and Surface area	**Task 1:BU** A real estate company sells plots of land. The plot shown below costs $84,120. What is the price per square foot of the land? Explain how you found your answer.  **Answer:** Divide the figure into two trapezoids and finding the area of each. Then add the areas and divide the total price by the area of the land to find the cost per square

<table>
<tr><td>6. How can you represent a transformation in the coordinate plane?
7. How do you recognize symmetry in a figure?</td><td></td><td rowspan="2">foot to be $1.60.

Task 2

The moat surrounding a castle is 18 ft wide and the wall by the moat of the castle is 24 ft high. If an invading army wishes to use a ladder to cross the moat and reach the top of the wall, how long mush that ladder be?

Answer:
The moat, the castle wall, and the ladder form a right triangle. The moat and a castle wall form the leg of the triangle and the ladder forms the hypotenuse. Use Pythagorean theorem to solve that the ladder must be 30 feet long.

Modifications and/or Accommodations:
● Special Education: Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.
● English Language Learners: Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of online bilingual dictionary, and modified assessment and/or rubric.
● Students at Risk of School Failure: Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat instructions as needed.</td></tr>
<tr><td>Content Statements</td><td>Cumulative Progress Indicators</td></tr>
</table>

Students will know… ● Points, lines, planes and angles. ● Polygons, similar figures, and congruent figures. ● Perimeter and area ● Pythagorean theorem ● Circles ● Volume ● Transformational geometry	● Tests ● Quizzes ● Practice problems for homework ● Workbook pages ● Worksheets	● **Gifted Students:** Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related talent development opportunities **Spot Light On:** *Show students the why behind how things are done when possible.*

Desired Results

- Points, Lines, Planes and Angles
- Polygons
- Perimeter and Area
- Volume and Surface area

Standards for Mathematical Practices

1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	
	Teacher Resources
	Mymathlab.com http://achievethecore.org https://learnzillion.com https://www.khanacademy.org/ https://www.desmos.com/ http://www.ixl.com

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35* Sally Ride The mission is to ensure that every student is able to see themselves in our rich and diverse history.	
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***

Self-Awareness Social Awareness Self-Management Relationship Skills Responsible Decision-Making	• Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Recognize the skills needed to establish and achieve personal and educational goals. • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	**x**	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	**x**	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*