











Marking Period	Unit Title	Recommended Instructional Days
3	Geometry	26 - 30
<b>Domain</b>		
<p><b>Strand:</b></p> <p> <b>7.RP.A.2</b> Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p> <b>7.RP.A.3</b> Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i></p> <p> <b>7.EE.A.2</b> Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, <math>a + 0.05a = 1.05a</math> means that “increase by 5%” is the same as “multiply by 1.05.”</i></p> <p> <b>7.EE.B.4</b> Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i></p> <p> <b>7.G.A.1</b> Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p> <p> <b>7.G.A.2</b> Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. <i>Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</i></p>		

 **7.G.A.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

 **7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

 **7.G.B.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

 **7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**Key:**



**Major Cluster**



**Supporting Cluster**



**Additional Cluster**

**Progress Indicator:** ♦ Tests ♦ Homework / Classwork ♦ Projects ♦ Formative assessments ♦ Summative assessments

**Mathematical Practices:**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reason 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.

**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit**

**Essential Questions:**

**Module 8:**

How can you use proportions to solve real-world geometry problems?  
How can you use scale drawings to solve problems?  
How can you draw shapes that satisfy given conditions?  
How are the interior angles of a triangle related?  
What is unique about the side lengths of a triangle?  
How can you identify cross sections of three-dimensional figures?  
How can you use angle relationships to solve problems?  
How are vertical and adjacent angles related?

**Module 9:**

How can you apply geometry concepts to solve real-world problems?  
How do you find and use the circumference of a circle?  
What is the relationship between the circumference and the diameter of a circle?  
How do you find the area of a circle?  
Why do different shapes have different formulas to describe the area?  
How can a formula help you to determine the area of a figure?  
How do you find the area of composite figures?  
How can you find the surface area of a figure made up of cubes and prisms?  
How can the surface area of an object be useful in real life?  
How do you find the volume of a figure made up of cubes and prisms?  
How are the volumes of a rectangular prism and a triangular prism related?  
If the formulas for finding the volumes of a rectangular prism and a triangular prism are the same, why is the process different?

**Essential Understandings:**

**Module 8:**

A scale drawing is proportional to the original drawing.  
A figure can be reduced or enlarged based on the scale.  
A triangle is a three-sided polygon with angle measures that have a sum of 180°.  
Angles are related in such a way that missing angles can be found by setting up and solving equations.

**Module 9:**

The area of a 2D figure describes the covering of the shape.  
The surface area of a 3D figure describes the covering of the shape.

Surface area is the sum of the areas of a composite figure (a net).  
The volume of a 3D figure is the amount of space the object occupies.  
Formulas can be used to find the volume of prisms.

**Vocabulary:**

- scale
- scale drawing
- cross section
- intersection
- adjacent angles
- complementary angles
- congruent angles
- supplementary angles
- vertex
- vertical angles
- circumference
- diameter
- radius

*\*Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts.*

**Suggested Activity Descriptions:**

- Project an image onto the board. Then, use the computer to resize the image both by reduction and enlargement. Help students connect the change in size to being proportional.
- In the hallway, take pieces of masking tape and create various angles on the floor. Ask students to use sticky notes to label the angle relationships.
- Have students work in groups of three. Give them a long piece of string that has been tied to form a circle. Each student will hold the string and form a vertex. Call out the various triangle classifications and have students move to create that type of triangle. Stop to discuss and make any corrections.
- Label three different corners of the room with the phrases, “no triangle”, “unique triangle”, and “more than one triangle”. Then, give students a condition and ask them to move to the appropriate corner of the room. Give students time to discuss in their group and then share with the class.
- Collect various circular items and have students practice finding the area and circumference of each item. Consider setting up stations where students use a string or a sewing measurement tape and measure and solve.
- To introduce nets and surface area, collect various boxes with different bases. Cut the edges and any excess that would not be a part of the net. Help students to see the various parts of the 3D object and how the net comes together. As an exploratory option, ask students to use their ruler to measure the different dimensions and find the surface area.

- Using a rectangular prism and a triangular prism with the same height and base measurements, ask students to predict how many triangular prisms can fit inside a rectangular prism. Help connect the B in each formula to the area of each base.
- GoMATH Activity 8.1 Scale a Comic (GoMATH TB page 242C-242D)
- GoMATH Activity 8.2 Draw a Triangle (GoMATH TB page 246A-246B)
- GoMATH Unit 4 Review Project: Buffon's Needle

◇ Suggested Sample Tasks:

**Activity Description:** Garden

**Interdisciplinary Connections:** Earth and Space Sciences

**Content:** Earth and Human Activity

Mrs. Thomas has two rolls of garden edging that are each 96 inches long. She wants to make two new flower beds in her backyard. Each flower bed will be bordered by one roll of the edging. One flower bed will be in the shape of a quadrilateral. The other will be in the shape of a triangle.

**Part A**

Mrs. Thomas decides to make a scale drawing of each flower bed using a scale 1 centimeter = 5 inches. What will be the total length of each roll of edging on her scale drawing?

**Part B**

Mrs. Thomas wants the quadrilateral flower bed to have at least two  $90^\circ$  angles. Draw a possible plan for this flower bed using the scale from Part A. Make sure to use a complete roll of edging in the border. Label your drawing with all the angle measures and with the scaled length of each side. Name the shape of the flower bed you drew. What will be the actual dimensions?

**Part C**

Mrs. Thomas began to make a drawing for the triangular flower bed. In her drawing, the length of one side of the triangle is 4.8 centimeters, the length of the second side is 6.4 centimeters, and the included angle is a right angle. Use these measures and the scale from Part A to make a completed scale drawing. Label your drawing with all the angle measures to the nearest whole degree and with the scale length of each side. What will be the actual dimensions of this flower bed?

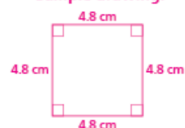
**KEY:**

**Part A**

19.2 cm

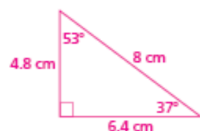
**Part B**

Sample drawing:



Sample answer: The flower bed is a square. The actual sides will each be 24 inches long.

**Part C**



The lengths of the three sides of the flower bed will be 24 in., 32 in., and 40 in.

**Interdisciplinary Connections:**

**Science:**

1. Astronomers sometimes use angle measures divided into degrees, minutes, and seconds. One degree is equal to 60 minutes, and one minute is equal to 60 seconds. Suppose that  $\angle J$  and  $\angle K$  are complementary, and that the measure of  $\angle J$  is 48 degrees, 26 minutes, 8 seconds. What is the measure of  $\angle K$ ? (GoMATH page 258)
2. Curriculum Connection: Surface area is an important factor in human biological systems. People often curl their hands into fists when cold. In doing so, they reduce the amount of surface area exposed to the cold air and reduce heat loss. Also, inside a pair of human lungs there are hollow cavities called alveoli that have a total surface area of about 90 to 120 m<sup>2</sup>. This large surface area means that carbon dioxide and oxygen can be released and absorbed more efficiently. (GoMATH TE page 284)

**Social Studies:**

1. Careers in Math (GoMATH page 231)
2. Mini Task: Ira built a model of the Great Pyramid in Egypt for a school project. The Great Pyramid has a square base with sides of length 756 feet. The height of the Great Pyramid is 481 feet. Ira made his model pyramid using a scale of 1 inch : 20 feet. (See parts a-d.) (GoMATH page 260)
3. Unit 4 Performance Task #1 (GoMATH page 301)
4. A forest ranger wants to determine the radius of the trunk of a tree. She measures the circumference to be 8.6 feet. What is the trunk's radius to the nearest tenth of a foot? (GoMATH page 304)

**Language Arts:**

1. Vocabulary Preview Activity on GoMATH page 232.
2. Reading Startup Activities on GoMATH pages 234 and 262.

**Art:**

1. Unit 4 Performance Task #2 (GoMATH page 302)

**\*Grade 7 Math/Science Connection**

Marking Period: 3

Science Module: F      Math Module(s): 9

Topics that Overlap: Data Analysis, Graphing, Area, Scale, Plotting a Graph

Science Aspects: Analyze visual evidence of volcanic eruptions using a contour map, model the movement of continents, locate the epicenter of an earthquake

Skills: Data collection, map skills, plate tectonics, measure distances between continents to determine the rate of movement

Math Aspects: Students will use a map, a ruler, and a compass to draw circles to find the epicenter of an earthquake. They will then find the circumference and area of all three circles. Students may also create dot or box plots using volcanic eruption data and then compare the data in them.

Skills: Creating a scale drawing, finding circumference and area of a circle, creating dot plots, creating box plots, comparing data in dot and/or box plots

**Spot Light On:** Tyler Kelly

<p style="text-align: center;"><b>Social and Emotional Learning:</b> <i>Competencies</i></p>	<p style="text-align: center;"><b>Social and Emotional Learning:</b> <i>Sub-Competencies</i></p>
<p>SEL Competencies:</p> <ul style="list-style-type: none"> <li>• Self-Awareness</li> <li>• Social Awareness</li> <li>• Self-Management</li> <li>• Relationship Skills</li> <li>• Responsible Decision-Making</li> </ul>	<ul style="list-style-type: none"> <li>• Recognizing the importance of self-confidence in handling daily tasks and challenges.</li> <li>• Demonstrate an awareness of the expectations for social interactions in a variety of ways.</li> <li>• Demonstrate an understanding of the need for mutual respect when viewpoints differ.</li> <li>• Identify and apply ways to persevere through alternative methods to achieve goals.</li> <li>• Utilize positive communication and social skills to interact effectively with others.</li> <li>• Develop, implement, and model effective problem solving and critical thinking skills.</li> </ul>

**Grade 7 Mathematics**  
**Unit 4: Geometry**

September  
2022

Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
<b>Formative Assessments:</b> • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Math Journals • Homework/Classwork • Teacher created assessments		<b>Benchmarks &amp; Summative Assessments:</b> • Chapter/Unit Assessments • Standardized Tests • District Assessments • Project-based Assessments	
Differentiated Student Access to Content: Teaching and Learning <i>Resources/Materials</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core Resources
Go Math Workbook, IXL, Personal Math Trainer, Math on the Spot Videos, My HRW, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Reteaching worksheets, Skill building workbook, Math manipulatives, Leveled practice worksheets	Dictionary for native language, Video tutorial in native language, Success for English Learners worksheets, GoMATH Leveled Strategies for English Learners, GoMATH Linguistic Support	ST Math Challenge Objectives, G&T tasks, Enrichment worksheets, Art of Problem Solving, Leveled assessments, GoMATH Teaching for Depth, Math Olympiad
Supplemental Resources			
<b>Technology:</b> • Chromebooks • Scientific/Graphing Calculators (upper grades only) • Online math manipulatives <b>Other:</b> • Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives			



Differentiated Student Access to Content: Recommended <i>Strategies &amp; Techniques</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics.	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.	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	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 content.

<b>NJSLS CAREER READINESS, LIFE LITERACIES &amp; KEY SKILLS</b>	<b>Disciplinary Concept(s):</b> Creativity and Innovation	
	<b>Core Ideas:</b>	With a growth mindset, failure is an important part of success.
	<b>Performance Expectation/s:</b>	9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
	<b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b>	
	<b>Act as a responsible and contributing community member and employee.</b> <b>Attend to financial well-being.</b> <b>Consider the environmental, social and economic impacts of decisions.</b>	

**Grade 7 Mathematics**  
**Unit 4: Geometry**

September  
2022

	<p>Demonstrate creativity and innovation.</p> <p>Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>Model integrity, ethical leadership and effective management.</p> <p>Plan education and career paths aligned to personal goals.</p> <p>Use technology to enhance productivity, increase collaboration and communicate effectively.</p> <p>Work productively in teams while using cultural/global competence.</p>
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New Jersey Legislative Statutes and Administrative Code (place an “X” before each law/statute if/when present within the curriculum map)									
	Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>		Holocaust Law: <i>N.J.S.A. 18A:35-28</i>	X	LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>	X	Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>		Standards in Action: <i>Climate Change</i>