

Unit 04: Geometry

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **FY**
Status: **Published**

Standards Alignment

New Jersey Student Learning Standards

MA.6.G	Geometry
MA.6.G.A	Solve real-world and mathematical problems involving area, surface area, and volume.
MA.6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
MA.6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
AAAA.K-12.1	Inquire, think critically, and gain knowledge.
AAAA.K-12.1.3	Responsibilities
AAAA.K-12.1.3.5	Use information technology responsibly.
AAAA.K-12.2.1	Skills
AAAA.K-12.2.1.4	Use technology and other information tools to analyze and organize information.
AAAA.K-12.3	Share knowledge and participate ethically and productively as members of our democratic society.
AAAA.K-12.3.1	Skills
AAAA.K-12.3.1.6	Use information and technology ethically and responsibly.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.

CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.
TECH.8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.

Interdisciplinary Connections: NJSL for ELA, Social Studies, Science and/or Math Section

Capacities of the Literate Individual Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

They build strong content knowledge.

They respond to the varying demands of audience, task, purpose, and discipline.

They comprehend as well as critique.

They value evidence.

They use technology and digital media strategically and capably.
They come to understand other perspectives and cultures.

LA.K-12.NJSLSA.R	Reading
MATH.K-12.1	Make sense of problems and persevere in solving them Key Ideas and Details
MATH.K-12.2	Reason abstractly and quantitatively
LA.K-12.NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.RL.6.1	Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
LA.K-12.NJSLSA.W	Writing Text Types and Purposes
LA.K-12.NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.W.6.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.W.6.1.A	Introduce claim(s) and organize the reasons and evidence clearly.
LA.W.6.1.B	Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
LA.W.6.1.C	Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.
LA.K-12.NJSLSA.SL	Speaking and Listening
LA.W.6.1.D	Establish and maintain a formal/academic style, approach, and form. Comprehension and Collaboration
LA.W.6.1.E	Provide a concluding statement or section that follows from the argument presented.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
LA.SL.6.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
LA.SL.6.1.A	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
LA.SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
LA.SL.6.1.C	Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media Literacy
New Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale

Unit Rationale

The purpose of this unit...

Understanding Geometry supports spacial awareness, measurement of objects, visual thinking, logical reasoning skills, pattern recognition and development throughout a variety of different fields.

Meaning

Essential Questions

Essential Questions

- How do we use measurements of two- and three-dimensional objects to solve real-world problems?

- How does a coordinate plane help us understand the world around us?
- How does understanding the formula for the area of a rectangle help derive other geometric formulas?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

- From engineering, to science and technology, the use of geometric shapes allows us to build everything from bridges, computers, skyscrapers, to spacecraft.
- The coordinate plane allows us to geometrically break large pieces into smaller pieces.
- Manipulating the formula for the area of a rectangle allows us to create formulas for a variety of shapes.

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know...

- How to analyze, interpret, apply, sort information to solve a specific problem
- Given a situation add, subtract, multiply, divide fractions, mixed numbers and decimals to solve real-world problems
- How do derive, use and manipulate formulas to find the area of parallelograms, triangles, and trapezoids.
- How to separate composite figures into rectangles, triangles, trapezoids, and parallelograms.
- How to graph polygons on a coordinate plane and use the coordinates to measure side lengths.
- How to draw and interpret three-dimensional figures and nets representing three-dimensional figures.
- How to calculate volume of rectangular prisms.

Skills

Skills

Student will be skilled at ...

- Given a situation, analyze and interpret the relationship between two quantities using ratios.

- Create and organize equivalent ratios in ratio tables in order to understand and predict quantities in real-life situations.

- Calculate and compare unit rates using graphs and tables in order to find the higher/lower rate among two scenarios.

- Create percent proportions as equivalent ratios in order to find the part, whole, or percent.

- Write and solve ratios to convert units of measurement.

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

[Unit 4 activities.docx](#)

[Unit 4-Cycle 1- Discover Jar STEaM.docx](#)

[Unit 4-Cycle 2 scavenger hunt answer page.docx](#)

[Unit 4-Cycle 2 scavenger hunt teacher instructions.docx](#)

[Unit 4 - PARCC practice.docx](#)

Formative Assessment Strategies

Formative Assessment Strategies

- ixl.com scores
- tenmarks.com scores
- teacher center observation

- STEM projects

Learning Activities/Unit of Study

Learning Activities/Unit of Study

Geometry: Approximately 6 Cycles

Cycle 1: Topics Covered

- Area of parallelograms
- Area of triangles

- Activities/Centers
 - IXL.com centers
 - BB.25 Area between two rectangles
 - BB.26 Area between two triangles
 - Tenmarks centers
 - 6.G.1 Finding the Area of Composite Figures
 - Hands-On/Creative Centers
 - Work with a partner to find the area of each triangle.
[http://www.commoncoresheets.com/Math/Area/Area%20of%20Triangles%20\(base%20and%20height\)/English/1.pdf](http://www.commoncoresheets.com/Math/Area/Area%20of%20Triangles%20(base%20and%20height)/English/1.pdf)
 - Online games
 - Area of parallelograms <https://www.studyladder.com/games/activity/area-of-parallelograms-13140>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 27—page 181-182
 - Bellringers: Week 27—page 180
 - Teacher created problems on white boards: find the area of different triangles and parallelograms
 - STEM activity: Create a discovery jar. Have students brainstorm all of the questions or ideas he/she is curious about related to science, technology, engineering, art, or math . Maybe it is why grass is green or how space travel started. Or how many varieties of leaves exist on the trees in the yard. Then put all of the questions into a mason jar. Each group chooses out of the jar at a center and will research and explore the topic. (This activity can be repeated throughout the year and questions can be added as well).*

Cycle 2: Topics Covered

- Area of trapezoids
- Area of composite figures

- Activities/Centers
 - IXL.com centers
 - BB.22 Perimeter
 - BB.23 Area
 - BB.24 Area of compound figures
 - Tenmarks centers
 - 6.G.1 Finding the Area of Composite Figures
 - Hands-On/Creative Centers
 - Measure each side of the trapezoids and find the area
<https://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/6-8/Traps-AS-DrawnTraps.pdf>
 - Scavenger hunt for composite figures*
 - Online games
 - <http://www.asset.asu.edu/new/mathactive/lessons/154/look.swf>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 26—page 178-179
 - Bellringers: Week 26—page 176-177
 - Teacher created problems on white boards:
 - STEM activity: Several centers dedicated to area and perimeter of composite figures
https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/24677-Area%20and%20Perimeter%20pack%201.pdf

Cycle 3: Topics Covered

- Polygons on the coordinate plane

- Activities/Centers
 - IXL.com centers
 - W.1 Objects on a coordinate plane
 - W.2 Graph points on a coordinate plane
 - W.3 Quadrants
 - Tenmarks centers
 - 6.G.3 Polygons in the Coordinate Plane
 - Hands-On/Creative Centers
 - Polygons on the coordinate plane <https://www.illustrativemathematics.org/content-standards/tasks/1188>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 26—page 174-175
 - Bellringers: Week 26—page 173

Cycle 4: Topics Covered

- Draw three-dimensional figures
- Name faces edges, vertices

- Activities/Centers
 - IXL.com centers
 - BB.32 Identify polyhedra and count faces, edges, and vertices
 - BB.33 Which figure is being described?
 - BB.34 Front, side, and top view
 - BB.35 Nets of 3-dimensional figures
 - Hands-On/Creative Centers
 - Students play with different views of three dimensional figures
<http://illuminations.nctm.org/Activity.aspx?id=4182>
 - Online games
 - Name the 3D figure <http://www.math-play.com/3d-shapes-game/3d-shapes-game.html>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 25—page 171-172
 - Bellringers: Week 25—page 169-170
 - Teacher created problems on white boards: name the vertices, faces, etc. of three-dimensional figures

Cycle 5: Topics Covered

- Surface area of prisms by making nets
- Surface area of pyramids

- Activities/Centers
 - IXL.com centers
 - BB.37 Surface area of cubes and rectangular prisms
 - BB.38 Volume and surface area of triangular prisms
 - BB.35 Nets of 3-dimensional figures
 - Tenmarks centers
 - 6.G.4 Finding the Surface Area of 3-D Figures Using Nets
 - Hands-On/Creative Centers
 - Surface area of prisms <http://7thgrademathteacherextraordinaire.blogspot.com/2012/04/hands-on-surface-area-of-prisms.html>
 - Online games
 - <http://www.mathgames.com/skill/7.145-surface-area>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 25—page 167-168
 - Bellringers: Week 25—page 166
 - Teacher created problems on white boards: Find the surface area of pyramids
 - STEM activity: wrapping presents to learn surface area
<http://www.cpalms.org/Public/PreviewResourceLesson/Preview/48827>

Cycle 6: Topics Covered

- Volume of rectangular prisms

- Activities/Centers
 - IXL.com centers
 - BB.36 Volume of cubes and rectangular prisms
 - Tenmarks centers
 - 6.G.2 Finding the Volume of a Rectangular Prism
 - Hands-On/Creative Centers
 - <http://www.learnnc.org/lp/pages/3487>
 - Online games
 - <https://www.studylander.com/games/activity/calculating-the-volume-of-rectangular-prisms-26331>
 - Xtramath: review flashcards
 - Teacher Directed Stations
 - Bellringers: Week 24—page 164-165
 - Bellringers: Week 24—page 162-163
 - Teacher created problems on white boards: find the volume of rectangular prisms
 - PARCC practice*

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, Gifted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers.

Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.