

# 04\_Geometry

Content Area: **Math**  
Course(s):  
Time Period: **Full Year**  
Length: **6 Weeks**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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The middle school Guided Study Program is a two-pronged program. It parallels the grade-level math curriculum to reinforce and/or preview concepts taught in the grade-level math class and prepares students for success on state-mandated assessments by targeting individual student mathematical deficiencies. Guided Study marking period grades are based upon participation/preparation, classwork, and summative assessments and are reported as: O (Outstanding), S (Satisfactory), or U (Unsatisfactory).

## **OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS**

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### **Objectives:**

- Develop a solid understanding of basic geometric concepts, including shapes, angles, lines, and polygons.
- Explore properties of 2D and 3D figures and their relationships.
- Apply geometric principles to solve real-world problems involving measurement, scale, and spatial reasoning.
- Enhance critical thinking skills through analyzing patterns, transformations, and congruence.
- Foster an appreciation for the role of geometry in various fields and applications.

### **Essential Questions:**

- What are the fundamental geometric shapes and their properties, and how do these properties help us classify and describe figures?
- How can we use geometric principles to solve problems related to measurement, area, perimeter, and volume?
- What is the significance of angles and lines in understanding geometric relationships and making accurate measurements?
- How do transformations (translations, reflections, rotations) affect the position and appearance of geometric figures?
- What is congruence, and how can we determine when two figures are congruent or similar?
- In what ways does geometry play a role in real-world contexts, such as architecture, art, and engineering?

### **Enduring Understandings:**

- Geometric shapes possess unique properties that allow us to classify, describe, and analyze them in different ways.
- Geometric principles are essential for solving problems involving measurement, scale, and spatial relationships in real-world scenarios.
- Angles and lines are fundamental elements that play a crucial role in defining and analyzing geometric figures.

- Transformations provide insights into how figures can be altered and manipulated while maintaining certain properties.
- Congruence and similarity are concepts that help us establish relationships between figures and solve various geometric problems.
- Geometry has practical applications in diverse fields and can be used to solve real-world challenges and create visual representations.

## CONTENT AREA STANDARDS

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MA.7.G.A.1	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.
MA.7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. 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.
MA.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.
MA.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.
MA.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.
MA.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.

## RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

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LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CS.K-12.2.d	Evaluate and select technological tools that can be used to collaborate on a project.
TECH.K-12.P.4	Demonstrate creativity and innovation.
TECH.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
TECH.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.

## STUDENT LEARNING TARGETS

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Refer to the 'Declarative Knowledge' and 'Procedural Knowledge' sections.

## **Declarative Knowledge**

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Students will understand that:

- Developing a spatial sense or an intuitive feel for shape and space can ease the comprehension of concepts in geometry.
- Geometric relationships are a means to solve problems.
- Geometric relationships make sense of a variety of phenomena.
- Two geometrical objects are called similar if they both have the same shape, or one has the same shape as the mirror image of the other; one of the shapes can be obtained from the other by uniformly scaling (enlarging or reducing), including additional translations, rotations, and/or reflections.
- Geometric modeling can help describe our physical environment.
- Geometric modeling can help interpret our physical environment.

## **Procedural Knowledge**

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Students will be able to:

- Identify parallel, perpendicular, intersecting lines, bisectors, and perpendicular bisectors.
- Classify and measure angles.
- Identify, describe, compare, and classify polygons including sub-classifications of triangles and quadrilaterals.
- Identify pairs of angles and angles formed by transversal and parallel lines to calculate missing angles.
- Understand and apply the Pythagorean Theorem.
- Plot points in all 4 quadrants of the coordinate plane.
- Perform transformations in the coordinate plane.
- Identify similarity, symmetry, and congruence.

## **EVIDENCE OF LEARNING**

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Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

## **Formative Assessments**

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- Do Now before each lesson
- Exit tickets at the end of each lesson and/or series of chunks of learning

## **Summative Assessments**

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This course allows students flexibility in the demonstration of their understanding at the conclusion of the unit:

- traditional/standardized assessment
- performance task
- project

## **RESOURCES (Instructional, Supplemental, Intervention Materials)**

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- [IXL](#)
- CMP3: Shapes and Designs

## **INTERDISCIPLINARY CONNECTIONS**

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- Architecture
- Art
- Engineering

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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See link to Accommodations & Modifications document in course folder.