Unit 5: Geometry

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

UNIT RATIONALE

The purpose of this unit is to extend student knowledge of angle relationships, properties of polygons--specifically triangles and quadrilaterals, area and perimeter of circles and composite figures, and properties of three dimensional figures including volume and surface area. Students will learn the importance of a variety of geometric formulas that can be used to solve real-world problems.

ESSENTIAL QUESTIONS

- How can we use knowledge of angle relationships in order to calculate unknown angle measurements?

- What are the properties of triangles and quadrilaterals and how do these properties help to classify, analyze, and calculate missing values?

- How are the formulas for area and circumference of a circle related to the circle's radius and diameter, and how can we use these formulas to calculate unknown areas and circumferences/perimeters of circles and composite figures?

- How are the formulas for surface area and volume created for prisms, pyramids, and cylinders and how can we use these formulas to solve a variety of problems?

- What strategies can be used to determine the cross section of a three-dimensional figure?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSLS) - Grade 7 - Mathematics (2020)

MA.7.G	Geometry
MA.7.G.A	Draw, construct, and describe geometrical figures and describe the relationships between them.

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	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
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.

New Jersey (NJSLS) - K-12 - Math Practice Standards (2020)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.
TECH.9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.8.1.8.AP.4	Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.

PRE-ASSESSMENTS

None given for this unit.

INSTRUCTIONAL PLAN

MODULE 1

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to classify types of angles so that we can find angle measures in geometric figures and solve problems requiring specific angle requirements.
Student Learning Strategies	-Peardeck Lesson on Types of Angles. -IXL Lessons W.16 and W.17
Success Criteria	I can identify adjacent, vertical, complementary and supplementary angles.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 2

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to classify triangles so that we can solve problems that involve triangles angle measure or side lengths.
Student Learning Strategies	-Peardeck Lesson on Classifying Triangles. -IXL Lessons W.3 and W.4
Success Criteria	I can identify a triangle as scalene, isosceles, or equilateral. I can identify a triangle as acute, right, or obtuse. I can use the triangle inequality to determine if a triangle with given side lengths can be formed.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Polygons and Triangles](#)

MODULE 3

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find angle measures of triangles so that we can solve problems involving triangles.
Student Learning Strategies	-Peardeck Lesson on Angles of Triangles. -IXL Lessons W.9 and W.10
Success Criteria	I can find the missing angle measure in a triangle.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.

Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 4

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to classify quadrilaterals so we can compare and contrast their characteristics and to solve problems that involve angle measure and side lengths.
Student Learning Strategies	-Peardeck Lesson on Quadrilaterals. -IXL Lessons W.6 and W.7; W.11 and W.12
Success Criteria	I can classify types of quadrilaterals as trapezoids parallelograms. I can classify parallelograms according to side len and angle measure. I can find the missing angle measure of a quadrilateral.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

Types of Quadrilaterals

MODULE 5

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to construct scale drawings so that we can find the perimeter and area of large objects that are drawn to a given scale.

Student Learning Strategies	-Peardeck Lesson on Scale Drawings. -IXL Lessons Z.1 through Z.4
Success Criteria	I can use the scale factor of a scale drawing to find the actual lengths of a figure and use those lengths to find perimeter and area of that figure. I can construct a scale drawing of a real-world object using a given scale factor.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Scale Drawing Activity.
Suggested Modifications	Students can work in groups.

MODULE 6

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find the circumference and area of circles so that we can solve problems involving circles or parts of circles.
Student Learning Strategies	-Peardeck Lesson on Circumference and Area of Circles. -IXL Lessons Y.5 through Y.10
Success Criteria	I can identify the radius and diameter of a circle. I can use the formulas for area and circumference of a circle. I can find the area or circumference of semicircles and quarter circles.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems.

	-Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 7

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find the area of triangles trapezoids so that we can solve real-world proble involving area of polygons.
Student Learning Strategies	-Peardeck Lesson on Area of Triangles and Trapezoids. -IXL Lessons Y.2 through Y.4
Success Criteria	I can find the area of a triangle and a trapezoid.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

Area of Triangles

Area of Trapezoids

MODULE 8

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find the area of combined figures so that we can solve real-world problems involving area of irregular shapes and to find surf area of three dimensional figures.
Student Learning Strategies	-Peardeck Lesson on Area of Combined Figures. -IXL Lessons Y.11 through Y.14

Success Criteria	I can find the area of a figure made up of sections consisting of rectangles, squares, triangles, and circles.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Area of Combined Figures](#)

MODULE 9

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find the surface area of three dimensional solids so that we can solve real-world problems involving surface area, such as wrapping a gift.
Student Learning Strategies	-Peardeck Lesson on Surface Area. -IXL Lessons Y.15 through Y.17
Success Criteria	I can find the surface area of a three dimensional solid by breaking it down into its component parts (nets).
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Cereal box project.
Suggested Modifications	Students can work in groups.

MODULE 10

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to find the volume of three dimensional solids so that we can solve real-world problems involving capacity of solids.
Student Learning Strategies	-Peardeck Lesson on Volume. -IXL Lessons Y.18 through Y.22
Success Criteria	I can find the volume of a cube, prism, pyramid, and cylinder by applying the formulas for these solids. I can explain what the concept of volume means.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Cereal box and can project.
Suggested Modifications	Students can work in groups.

REFLECTIONS

Due to time constraints, this unit was only briefly touched upon (area only).

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

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.RI.7.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.
LA.K-12.NJSLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.W.7.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.