Unit 09: Three-Dimensional Geometry

Content Area: **TEMPLATE**
Course(s):
Time Period: **Full Year**
Length: **3 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will build an understanding of what it means to find the surface area and volume of three-dimensional figures. They will develop strategies and formulas for finding the volume of rectangular prisms and the surface area of rectangular prisms, triangular prisms and square pyramids.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Essential Questions:

- How do I utilize given formulas to calculate surface area and volume?
- How can I determine the surface area of a prism from a net or a three-dimensional representation of the prism?
- What is the difference between the area of a two-dimensional figure and surface area of a prism?

Essential Understandings:

- Measurement of surface area and volume for solid figures is used in many practical, scientific and engineering problems.
- Volume and surface area can be found using a variety of strategies.
- How to solve practical problems using surface area and volume formulas.

CONTENT AREA STANDARDS

MA.K-12.1	Make sense of problems and persevere in solving them.
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.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.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.

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

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.K-12.NJSLSA.L1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CS.K-12.2	Collaborating Around Computing and Design
CS.K-12.3	Recognizing and Defining Computational Problems
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- Volume can be found by filling a three- dimensional figure with unit cubes as well as applying a formula.
- A net is a two-dimensional representation of a three-dimensional figure.
- How to recognize nets of three-dimensional figures.

Procedural Knowledge

Students will be able to:

- Apply formulas to find the volume of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
- Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of appropriate unit fractional edge lengths.
- Use nets made up of rectangles and triangles to find the surface area of three-dimensional figures.
- Represent three-dimensional figures using nets made up of rectangles and triangles.
- Apply techniques using nets in the context of solving real-world or mathematical problems.

EVIDENCE OF LEARNING

Formative Assessments

- Observations/Checklists
- Classwork
- Do Now Questions/Exit Tickets
- Self Assessment Questions
- IXL Skills Practice
- Student Proficiency Scale

Summative Assessments

- Portfolio Artifacts

Averages are based upon participation/preparation, classwork, and quizzes. Student marking period grades are either O (outstanding), S (satisfactory), or U (unsatisfactory).

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Covering & Surrounding*
- Savvas Realize (teacher and student resources)
- Khan Academy
- IXL- Recommended Skills Practice
    - FF.18 Volume of Cubes and Rectangular Prisms
    - FF.19 Volume of Cubes and Rectangular Prisms with Fractional Side Lengths
    - FF.20 Volume of Cubes and Rectangular Prisms: Word Problems
    - FF.21 Surface Area of Cubes and Rectangular Prisms
    - FF.23 Surface Area of Triangular Prisms
- MathXL for School
- Illustrative Mathematics Performance Tasks
- NCTM Illuminations
- Quiz Review Sheet (see classroom teacher)

INTERDISCIPLINARY CONNECTIONS

- Computations
- Financial/Economic/Business/Entrepenerial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.