Unit 7: Area, Surface Area, & Volume

Content Area: **Math**
Course(s): **Math**
Time Period: **March**
Length: **5 weeks**
Status: **Published**

Unit Overview

In this unit, students will learn about the following topics:

- Finding area and missing dimensions of parallelograms, squares, and rectangles

- Finding area and missing dimensions of triangles

- Finding area and missing dimensions of trapezoids and kites

- Finding faces, edges, and vertices for 3D shapes

- Drawing 3D shapes

- Finding surface area and missing dimensions of rectangular and triangular prisms

- Finding surface area and missing dimensions of rectangular and triangular pyramids

- Finding volume of rectangular prisms and cubes

Enduring Understandings

SWBAT:

- Relate area of a rectangle to area of a parallelogram

- Find the area of a parallelogram

- Find a missing dimension of a parallelogram

- Relate area of a parallelogram to area of a triangle

- Find the area of a triangle

- Find a missing dimension of a triangle

- Use decomposition to find the area of a composite figure

- Relate area of a parallelogram to area of a trapezoid

- Decompose trapezoids and kites into smaller shapes to find the area

- Find the number of faces, edges, and vertices of a 3D shape

- Draw prisms and pyramids

- Draw front, side, and top views of a 3D shape

- Draw nets to represent prisms and pyramids

- Use nets to find surface area of prisms and pyramids

- Solve real-world problems involving surface area of prisms and pyramids

- Use the formula to find volume of a rectangular prism

- Use the formula to find volume of a cube

- Solve for a missing dimension of a rectangular prism or cube

- Solve real-world problems involving the volume of rectangular prisms and cubes

Essential Questions

How can we:

- show that rectangles can be transformed into parallelograms by cutting a corner off and attaching it to the opposite side?
- use base and height of a parallelogram to find its area? [A=bh]
- use the area of a parallelogram and one of its dimensions to solve for a missing dimension?

How can we:

- show that a parallelogram is really just two triangles when deriving the formula [A=1/2bh]?
- use base and height of a triangle to find its area?
- use the area of a triangle and one of its dimensions to solve for a missing dimension?
- decompose a figure into triangles, parallelograms, and squares to find its area?

How can we:

- show that trapezoid can be turned into a parallelogram by slicing a triangle off one side and flipping it horizontally?
- decompose trapezoids into triangles and rectangles to find their area?
- decompose kites into triangles to find their area?
- Use the trapezoid formula to find its area [A=1/2(h)(b1+b2)]

How can we:

- find the number of faces, edges, and vertices of a 3D prism or pyramid?

- draw prisms and pyramids?
- draw the front/side/top views of a prism or pyramid?

How can we:

- solve real-world problems including surface area of prisms and pyramids?
- draw nets of prisms and pyramids to find their area?
- utilize the formula for surface area of a prism?

How can we:

- solve real-world problems including volume of rectangular prisms?
- utilize formulas for volume of a rectangular prism?
- utilize formulas for volume of a cube?
- use the volume of a rectangular prism and two of its dimensions to find the missing dimension?

Instructional Strategies & Learning Activities

- Guided Practice
- Daily Do Now
- Extra Practice & Puzzle Time (Resources)
- Scavenger Hunts
- Coloring Activities
- Task Cards (Around the World)
- Maze Activities
- Quizizz Online Assignments
- Kahoot! Online Games
- GimKit Online Games

Integration of 21st Century Themes and Skills

9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
PFL.9.1.8.A.6	Explain how income affects spending decisions.

Technology & Design Integration

8.1.8.AP.4	Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
TECH.8.2.8.C.5b	Create a technical sketch of a product with materials and measurements labeled.

Interdisciplinary Connections

L.VL.6.3	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies.
VPA.1.3.P.D.2	Create two and three-dimensional works of art while exploring color, line, shape, form, texture, and space.

Differentiation

Definitions of Differentiation Components:

- Content – the specific information that is to be taught in the lesson/unit/course of instruction.
- Process – how the student will acquire the content information.
- Product – how the student will demonstrate understanding of the content.
- Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.

- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
- Limit number/difficulty of problems for low-achieving students to demonstrate mastery.
- Narrow down problem choice to core concepts for low-achieving students.
- Leveled group-based activities, determined by formative assessment.

Modifications & Accommodations

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.

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Benchmark Assessments

Schoolwide Benchmark assessments:

- Linkit Benchmarks (Form A in September, Form B in January, Form C in June): Linked to NJSLA standards

Additional Benchmarks used in this unit:

- IXL Diagnostic + continued practice during IXL periods

Formative Assessments

Formative Assessments used in this unit:

- Kahoot! Games

- Quizizz Games

- Homework

- Q & A

- Scavenger Hunts

- Coloring Activities

- Task Cards

- Partner Activities

Summative Assessments

Summative assessments for this unit:

- Chapter Test
- Quizzes

Instructional Materials

1. Big Ideas Math: Math & You 6th Grade Textbook
2. Quizizz
3. Kahoot!
4. Scavenger Hunts
5. Task Cards
6. Coloring Activities
7. GimKit

Standards

6.EE.A.2.c	Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
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.
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.
6.G.A.4	Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) 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.