South Park School District	Lesson Plan	2016-2017

Dates	This unit consists of approximately 13 days of instruction, review, and assessment.	**Course/Grade**	7th Grade Math
Unit	Volume and Surface Area Unit 4 Part 3	**Teacher**	**Mrs. Radomski**

Essential Questions (Maximum 2):

How can we use surface area and volume in real-world situations?

Pennsylvania State Standards: (Mathematics)

M07.B-E.2.2.1 Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers.

M07.B-E.2.3.1 Determine the reasonableness of an answer(s), or interpret the solution(s) in the context of the problem.

M07.C-G.1.1.4 Describe the two-dimensional figures that result from slicing three-dimensional figures.

M07.C-G.2.2.2 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. **Formulas will be provided.**

Pennsylvania State Common Core Standards: (Mathematics)

2.2 Algebraic Concepts

CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

2.3 Geometry

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

CC.2.3.7.A.2 Visualize and represent geometric figures and describe the relationships between them

Pennsylvania State Common Core Standards: (English Language Arts)

1.2 Reading Informational Text

Students read, understand, and respond to informational text—with an emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with focus on textual evidence.

CC.1.2.7.A
Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

CC.1.2.7.B
Cite several pieces of textual evidence to support analysis of what the text says explicitly, as well as inferences, conclusions, and/or generalizations drawn from the text.

CC.1.2.7.F
Determine the meaning of words and phrases as they are used in grade-level reading and content, including interpretation of figurative, connotative, and technical meanings.

CC.1.2.7.J
Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

CC.1.2.7.K
Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

CC.1.2.7.L
Read and comprehend literary nonfiction and informational text on grade level, reading independently and proficiently.

1.3 Reading Literature

Students read and respond to works of literature—with an emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with a focus on textual evidence.

CC.1.3.7.B
Cite several pieces of textual evidence to support analysis of what the text says explicitly, as well as inferences, conclusions, and/or generalizations drawn from the text.

CC.1.3.7.F
Determine the meaning of words and phrases as they are used in grade-level reading and content, including interpretation of figurative, connotative meanings.

CC.1.3.7.I
Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

1.4 Writing

Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.

CC.1.4.7.A
Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information clearly.

CC.1.4.7.C
Develop and analyze the topic with relevant facts, definitions, concrete details, quotations, or other information and examples; include graphics and multimedia when useful to aiding comprehension.

CC.1.4.7.D
Organize ideas, concepts, and information using strategies such as definition, classification, comparison/contrast, and cause/effect; use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts; provide a concluding statement or section; include formatting when useful to aiding comprehension.

CC.1.4.7.F
Demonstrate a grade appropriate command of the conventions of Standard English grammar, usage, capitalization, punctuation, and spelling.

CC.1.4.7G
Write arguments to support claims.

CC.1.4.7.I
Acknowledge alternate or opposing claims and support claim with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic.

CC.1.4.7.J
Organize the claim(s) with clear reasons and evidence clearly; clarify relationships among claim(s) and reasons by using words, phrases, and clauses to create cohesion; provide a concluding statement or section that follows from and supports the argument presented.

CC.1.4.7.L
Demonstrate a grade appropriate command of the conventions of Standard English grammar, usage, capitalization, punctuation, and spelling.

1.5 Speaking and Listening

Students present appropriately in formal speaking situations, listen critically, and respond intelligently as individuals or in group discussions.

CC.1.5.7.A
Engage effectively in a range of collaborative discussions, on grade-level topics, texts, and issues, building on others' ideas and expressing their own clearly.

CC.1.5.7.D
Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CC.1.5.7.G
Demonstrate command of the conventions of Standard English when speaking based on Grade 7 level and content.

Skills

- Identify 3-Dimensional Figures & How Their Nets Form the Lateral Faces or Lateral Surfaces
- Find the Volume & Surface Area of Similar 3-Dimensional Figures
- Find the Surface Area of Prisms & Pyramids
- Find the Volume of Prisms & Composite Figures

Assessments

☒ Tests
☒ Quizzes
☒ Worksheets
☒ Homework
☒ Teacher Observation
☒ Student Writing
☐ Student Presentations
☐ Student Projects
☒ Student Written Response (reflection)
☐ Peer Evaluation
☐ Rubric Scoring
☒ Group Grade
☐ Other

Resources

☒ Textbook
Go Math Accelerated Grade 7 Workbook
Scholastic Math Magazine

☒ Supplementary Materials
Materials listed on Unit Lesson Plans

☒ Workbook/Worksheets

☒ Teacher-prepared materials

☒ Individual Title

☒ Technology
Go Math Online Textbook
Chromebooks
Google Classroom
Khan Academy

☒ Other
Modified homework and assessments
Intervention and Enrichment worksheets to help reinforce difficult concepts presented or to engage in higher-level applications of concepts.

Special Education Adaptations/Modifications:
• Adapted/modified assignments and/or assessments for gifted / enriched students
• Follow IEP / 504 / GIEP / SDI accommodations as documented

Differentiated Instruction / SGI Activities:
• Critical Thinking – Open-ended class discussion
• Cooperative learning
• Peer lead grouping
• Problem-solving activities

Reading & Writing:
• Non-fiction reading excerpts that include writing prompts and multiple choice questions – monthly Scholastic Math Magazines and unit related articles

Math 7
Mrs. Radomski
Unit 4 and Unit 10 Part 3– Volume and Surface Area (13 days)

Unit Order ***Date***	**Lessons and *Objectives*** **Bell Ringer**	**Activities / Materials / Assessments / <u>Homework</u>**
1 of 13 *1/30/17*	Identifying 3-Dimensional Figures Drawing Three-Dimensional Figures *Students draw, name, and identify parts of three-dimensional figures.* Volume of Prisms *Students will be able to calculate the volume of rectangular prisms.* **Warm-up Question:** What does it mean if a figure is 3-D? {it is 3 dimensional- height, width, and depth}	▪ Pass back and go over the Unit 4 Part 2 Test ▪ Go over the What is a Cross Section? Notes ▪ As a class, we will complete the Cross Section-Card Sort Activity (each group will get 2-3 cards and explain their answers to the cards to the class) ▪ Go over the How Do You Find the Volume of Rectangular Prisms? Notes ▪ The students should work with their partners on the Volume of Rectangular Prisms WS and we will go over it when they finish **HW: Complete the What is a Cross Section and How Do You Find the Volume of Rectangular Prisms WS**
2 of 13 *1/31/17*	Volume of Prisms *Students will be able to calculate the volume of rectangular and triangular prisms.* **Warm-up Question:** Using your formula sheet, find the equation for volume of a rectangular prism? {V= lwh}	▪ Check and go over the homework (What is a Cross Section and How Do You Find the Volume of Rectangular Prisms WS) ▪ Go over the How Do You Find the Volume of a Triangular Prism? Notes ▪ The students should work with their partners on the Volume of Triangular Prisms WS and we will go over it when they finish ▪ Have the students begin the SGI activities that will also carry into tomorrow o SGI Group 1: Volume of Rectangular Prisms Task Cards Activity (Student Led) o SGI Group 2: Volume of Rectangular Prisms Mazes Activity (Student Led) o SGI Group 3: Volume of Triangular Prisms Cut and Paste Activity (Student Led) **HW: None**
3 of 13 *2/1/17*	Review of Volume *Students will be able to review concepts taught in previous lessons on volume.* **Warm-up Question:** Find the volume of a rectangular prism with a length of 5 in, a width of 10 in, and a height of 2 in. {100 $inch^3$}	▪ Have the students finish the SGI activities that they started yesterday o SGI Group 1: Volume of Rectangular Prisms Task Cards Activity (Student Led) o SGI Group 2: Volume of Rectangular Prisms Mazes Activity (Student Led) o SGI Group 3: Volume of Triangular Prisms Cut and Paste Activity (Student Led) **HW: None**

4 of 13 *2/2/17*	Volume Quiz *Students will be able to discuss and demonstrate understanding of previous lessons by working on a graded assessment.* **Warm-up Question:** Are there any questions before the quiz? {Answers will vary}	▪ Have the students take the Volume Quiz ▪ When the students finish the quiz, they should work on Khan Academy on their Chrome Books ▪ Once everyone is done, go over the What Is A Composite Object? Notes ▪ SGI: Have the students work with groups of 3 on the 3D Composite Solids "He Said, She Said" Activity **HW: None**
5 of 13 *2/3/17*	Solving Problems Using Volume *Students will be able to solve real world problems using volume.* **Warm-up Question:** How do you find the volume of a composite solid formed by two or more prisms? {You find the volume of each prism and then you add them together.}	▪ Pass back and go over the Volume Quiz ▪ Go over the How Can We Use Volume to Solve Problems? Notes ▪ SGI: Have the students work with groups of 3 on the Volume of Prisms Scavenger Hunt Activity ▪ When they are finished, they should work on the How Can We Use Volume to Solve Problems? WS **HW: Complete the How Can We Use Volume to Solve Problems? WS**
6 of 13 *2/6/17*	Nets and Surface Area *Students will be able to draw, name, and identify parts of three-dimensional figures. Students will be able to calculate the surface area of rectangular prisms.* **Warm-up Question:** How would you define surface area? {The total area of the surface of a three-dimensional object.}	▪ Check and go over the homework How Can We Use Volume to Solve Problems? WS) ▪ Go over How Are 3D Figures and Area Related? Notes ▪ The students should work with their partners on the How Are 3D Figures and Area Related? WS and we will go over it when they finish ▪ Go over the How Do You Find the Surface Area of Rectangular Prisms? Notes ▪ Have the students complete the How Do You Find the Surface Area of Rectangular Prisms? WS **HW: None**
7 of 13 *2/7/17*	Surface Area of Prisms *Students will be able to calculate the surface area of triangular prisms.* **Warm-up Question:** What do you think is the difference between rectangular prisms and triangular prisms is? {the base-one is rectangular and one is triangular}	▪ Go over How Are Triangular Prisms Different Than Rectangular Prisms? Notes ▪ Have the students work on the How Are Triangular Prisms Different Than Rectangular Prisms? WS and go over it when they are finished ▪ SGI: Have the students work with groups on the Surface Area of Prisms Solve and Color Activity **HW: None**
8 of 13 *2/8/17*	Surface Area Quiz *Students will be able to discuss and demonstrate understanding of previous lessons by working on a graded assessment.* Surface Area of Pyramids *Students will be able to calculate the surface area of pyramids.* **Warm-up Question:** Are there any questions before the quiz? {Answers will vary}	▪ Have the students take the Surface Area Quiz ▪ When the students finish the quiz, they should finish their activities from yesterday and then work on Khan Academy on their Chrome Books ▪ During the second period, go over the How Does the Base Impact the Surface Area of a Pyramid? Notes ▪ Have the students work on the Surface Area of a Pyramid WS **HW: Finish the Surface Area of a Pyramid WS**

9 of 13 *2/9/17*	Solving Problems Using Surface Area *Students will be able to solve real world problems using surface area.* **Warm-up Question:** You know how to solve for the area and volume of composite figures. How do you think you can solve problems for the surface area of composite figures? {find the surface area of each individual shape and then you add them together and subtract twice the area of the parts not on the surface}	▪ Pass back and go over the Surface Area Quiz ▪ Go over the How Can We Use Surface Area to Solve Problems? Notes ▪ Have the students work on pg. 287 #4-13 and put the problems on the board when the students finish ▪ Have the students work on the How Can We Use Surface Area to Solve Problems? WS and go over it when they are finished **HW: None**
10 of 13 *2/10/17*	Review of Surface Area *Students will be able to review concepts taught in previous lessons on surface area.* **Warm-up Question:** What is the surface area of a rectangular prism with a length of 20 cm, a width 6 cm, and a height of 4 cm? {448 cm^2}	▪ Have the students begin the SGI activities that will also carry into tomorrow o SGI Group 1: Surface Area Task Cards Activity (Student Led) o SGI Group 2: Total and Lateral Surface Area Domino Activity (Student Led) o SGI Group 3: Surface Area and Nets Cut and Paste Activity (Student Led) **HW: None**
11 of 13 *2/13/17*	Review of Surface Area *Students will be able to review concepts taught in previous lessons on surface area.* **Warm-up Question:** How far along are you on the three activities? {Answers will vary}	▪ Have the students finish the SGI activities that they started yesterday o SGI Group 1: Surface Area Task Cards Activity (Student Led) o SGI Group 2: Total and Lateral Surface Area Domino Activity (Student Led) o SGI Group 3: Surface Area and Nets Cut and Paste Activity (Student Led) **HW: None**
12 of 13 *2/14/17*	Cumulative review of Unit 4 Part 3 Objectives. *Students will be able to review the material covered in Unit 4 Part 3.* **Warm-up Question:** What is the surface area of a rectangular prism with a length of 18 cm, a width 30 cm, and a height of 20 cm? {3000 cm^2}	▪ SGI: Have the students complete the Surface Area of Pyramids Scavenger Hunt ▪ The students should work on the Volume and Surface Area Study Guide **HW: Finish the study guide and study for the test**
13 of 13 *2/15/17*	Unit 4 Part 3 Test *Students are individually evaluated on their understanding of the objectives in Unit 4 Part 3.* **Warm-up Question:** Are there any questions before the test? {Answers will vary}	▪ Check and go over the homework (Volume and Surface Area Study Guide) ▪ Give the students a final chance to ask any questions they have about the material that will be covered on the test ▪ Have the students complete the Unit 4 Part 3 Test (they can use their formula sheet) ▪ When the students finish the assignment, they should work on Khan Academy on their Chrome Books **HW: None**