Trimester:	Unit Title:	Recommended Instructional Days:
3	**Surface Area and Volume**	**15 - 19 days**

Domains: Geometry

Strand:

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.

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.

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.

Key:

Major Cluster **Supporting Cluster** **Additional Cluster** **Climate Change Opportunity**

Progress Indicators: ◊ Tests ◊ Homework / Classwork ◊ Projects ◊ Formative Assessments ◊ Summative Assessments

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reason of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

Essential Questions:
Lesson 1: How can you find the surface area of a figure made up of cubes and prisms?
Lesson 2: In what ways can understanding the surface area of cylinders help us in fields like manufacturing and design?
Lesson 3: How can we calculate the surface area of a pyramid using its dimensions and properties?
Lesson 4: How do you find the volume of a figure made up of cubes and prisms? How are the volumes of a rectangular prism and a triangular prism related? If the formulas for finding the volumes of a rectangular prism and a triangular prism are the same, why is the process different?
Lesson 5: What is the relationship between the volume of a pyramid and the volume of a prism with the same base area and height?
Lesson 6: How can you identify cross sections of three-dimensional figures?

Essential Understandings:
The surface area of a 3D figure describes the covering of the shape.
Surface area is the sum of the areas of a composite figure (a net).
The volume of a 3D figure is the amount of space the object occupies.
Formulas can be used to find the volume of prisms.
Each 3 dimensional geometric figure can be sliced to show 2 dimensional figures.

Vocabulary:
- lateral surface area
- regular pyramid
- slant height
- cross section

**Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts. When students encounter a new definition, encourage them to write in their Big Ideas Student Journals. They will revisit these definitions during the Chapter Review.*

Suggested Activity Descriptions:
- Chapter Exploration problems on TB page 408.
- Exploration Activities at the beginning of each section.
- Provide students with nets of cylinders, prisms, and pyramids, and have them cut out and assemble the nets into 3D shapes. Then, have them calculate the surface area of each shape by summing the areas of the individual faces. This visual and tactile approach helps students understand how 2D nets relate to 3D shapes.
- Create a scavenger hunt where students must find objects around the classroom or school that resemble cylinders, prisms, and pyramids. They then measure the dimensions of these objects and calculate their volume and surface area. This activity encourages students to apply their knowledge to real-life objects and practice their measurement skills.

Interdisciplinary Connections:
Science:

1. Big Ideas STEAM Video and corresponding questions on TB page 407.
2. Big Ideas STEAM Performance Task. QR Code on TB page 445.
3. Question #17 on TB page 420: The Petri dish shown has no lid. What is the surface area of the outside of the Petri dish?

Music:

1. Question #19 on TB page 420: A ganza is a percussion instrument used in samba music. Find the surface area of each of the two labeled ganzas. The smaller ganza weighs 1.1 pounds. Assume that the surface area is proportional to the weight. What is the weight of the larger ganza?

Art:

1. Question #25 on TB page 444: An artist plans to paint bricks. Find the surface area of the brick. The artist cuts along the length of the brick to form two bricks, each with a width of 2 inches. What is the percent of increase in the surface area? Justify your answer.

Physical Education:

1. Question #20 on TB page 414: A label that wraps around a box of golf balls covers 75% of its lateral surface area. What is the value of x?

Language Arts:

1. Writing Question #4 on TB page 411: Explain the meaning of each term in the formula for the surface area of a rectangular prism.
2. Writing Question #5 on TB page 417: Which part of the formula $S = 2\pi r^2 + 2\pi rh$ represents the lateral surface area of a cylinder? The areas of the bases?
3. Vocabulary Question #3 on TB page 423: Can a pyramid have rectangles as lateral faces? Explain.
4. Writing Question #5 on TB page 435: How is the formula for the volume of a pyramid different from the formula for the volume of a prism?
5. Vocabulary Question #5 on TB page 441: What is a cross section?

Spot Light On: Ron Buckmire

Social and Emotional Learning: *Competencies*	**Social and Emotional Learning: *Sub-Competencies***
SEL Competencies: • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making	• Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Identify and apply ways to persevere through alternative methods to achieve goals.

	• Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.
Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Big Ideas Student Journals • Homework/Classwork • Teacher Created Assessments • Progress Monitoring Items • Formative Assessment Tips in Big Ideas Teacher Edition	**Benchmarks & Summative Assessments:** • Chapter/Unit Assessments • Standardized Tests • Project-based Assessments • Benchmark Tests

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
Big Ideas Student Journal, Dynamic Assessment System, iReady, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Reteach worksheets, Extra Practice worksheets, Math manipulatives, Scaffolding Instructions in each section of textbook, Tutorial Videos, Skills Review Handbook, Skills Trainer	Dictionary for native language, Video tutorial in native language, ELL Support in each section of Big Ideas Teacher's Edition	ST Math Challenge Objectives, G&T tasks, Enrichment and Extension worksheets, Art of Problem Solving, Leveled assessments

Supplemental Resources

Technology:
• Chromebooks • Scientific Calculators • Online math manipulatives
Other:
• Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives

Differentiated Student Access to Content: **Recommended *Strategies & Techniques***			
Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics.	Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related content.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept(s):** Creativity and Innovation	
	Core Ideas:	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.
	Performance Expectation/s:	9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries.
	Career Readiness, Life Literacies, & Key Skills Practices	
	Act as a responsible and contributing community member and employee. **Attend to financial well-being.** **Consider the environmental, social and economic impacts of decisions.** **Demonstrate creativity and innovation.** **Utilize critical thinking to make sense of problems and persevere in solving them.**	

	Model integrity, ethical leadership and effective management. **Plan education and career paths aligned to personal goals.** **Use technology to enhance productivity, increase collaboration and communicate effectively.** **Work productively in teams while using cultural/global competence.**

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	**X**	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	**X**	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*