Updated August 2024

| Marking Period | Unit Title | Recommended Instructional Days |
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| 4 | Two- and Three-Dimensional Models | 15-20 days |

**Domain: Geometry**

***NJSLS Strand:***

**Key**:

Major Cluster

Supporting Cluster

Additional Cluster

***G.GMD.A.1: Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.***
***G.GMD.A.2 (+): Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.***
***G.GMD.A.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. ⋆***
***G.GMD.B.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects***

***Progress Indicator:***
***Tests ● Quizzes ● Practice problems for homework ● Online textbook ● Worksheets ● Leveled assessments***

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

**Essential Questions:**

1. **How are three-dimensional figures and polygons related?**
2. **How does the volume of a prism or cylinder relate to a cross section parallel to its base?**
3. **How are the formulas for volume of a pyramid and volume of a cone alike?**
4. **How does the volume of a sphere relate to the volumes of other solids?**

**Activity Description:**

- **Cross Sections of Solids**
- **Volumes of Prisms and Cylinders**
- **Volumes of Pyramids**
- **Surface Areas and Volumes of cones**
- **Surface Areas and Volumes of Spheres**
- **Modeling with Surfaces Area and Volume**

**Interdisciplinary Connections:**
**Topic 11 Project**
**Design a Rigid package**
**You will design a rigid package for a product of your choice. Your design will address factors such as attractiveness, protection for the product, and cost. You will then draw two and three-dimensional representations of your package and build a prototype.**
Career Readiness, Life Literacies and Key Skills **Content: Manufacturing, Cost analysis. NJSLS#: G.MG.A.1, G.GMD.B.4) (Next Generation Science Standards ETS1-2)**

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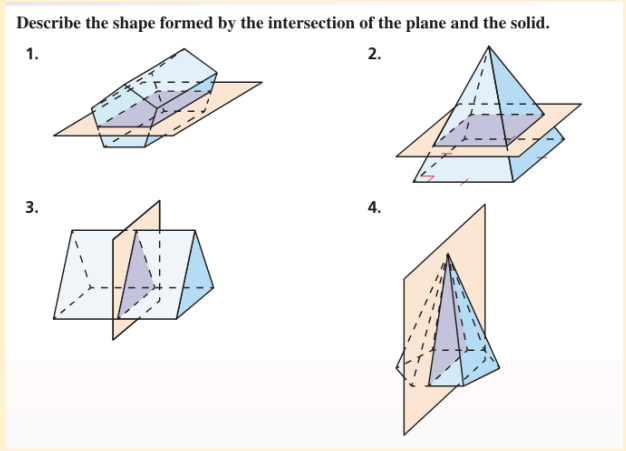
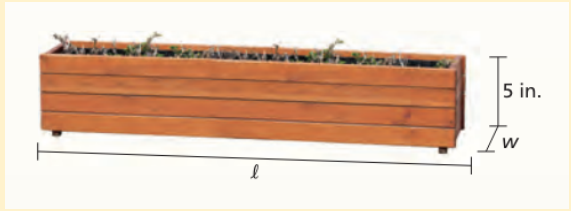
| ***generated by rotations of two-dimensional objects.***<br>***G.MG.A.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).***<br>***G.MG.A.2: Apply properties of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).***<br>***G.MG.A.3: Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*** | | **Spot Light On:**<br>**LBGT and Disabilities Law: N.J.S.A 18A:34-4.35**<br>● Neil Devine - American stellar and planetary astrophysics whose work centered on the understanding of star formation.<br><br>**Climate Change Example:** Students may use circles, their measures, and their properties to describe the cross section of a tree and compare changes in radial diameter or circumference variations of tree trunks when considering changes in seasonal weather patterns over time.<br><br>**Climate Change Example:** Students may apply the concept of population density of different urban areas, including calculations of population density, and discuss different environmental factors (e.g., air and water quality, waste disposal, energy consumption) that might be exacerbated by increased population density.<br><br>**Climate Change Example:** Students may apply geometric methods to solve design problems such as increasing access to green spaces in cities given physical and cost constraints.<br><br>**Example Tasks:**<br><br>**Task 1:** |

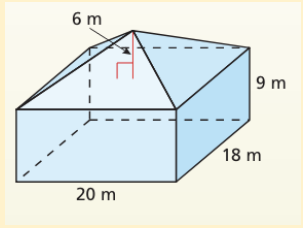



**Task 2:**
You are designing a rectangular planter box. You want the length to be 6 times the width, the height to be 5 inches, and the volume to be 1080 cubic inch




**Task 3:**

Find the volume of the composite solid.



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| **Mathematics Practices** | | |
| 1. Make sense of problems and persevere in solving them.<br>2. Reason abstractly and quantitatively.<br>3. Construct viable arguments and critique the reason of others.<br>4. Model with mathematics.<br>5. Use appropriate tools strategically.<br>6. Attend to precision.<br>7. Look for and make use of structure.<br>8. Look for and express regularity in repeated reasoning. | | |
| **Social and Emotional Learning:** ***Competencies*** | **Social and Emotional Learning:** ***Sub-Competencies*** | |
| Self- awareness<br><br>Social Awareness<br><br>Self- Management<br><br>Relationship Skills<br><br>Responsible Decision-Making | Recognizing the importance of self-confidence in handling daily tasks and challenges.<br>Demonstrate an awareness of the expectations for social interactions in a variety of ways.<br>Demonstrate an understanding of the need for mutual respect when viewpoints differ.<br>Recognize the skills needed to establish and achieve personal and educational goals.<br>Utilize positive communication and social skills to interact effectively with others.<br>Develop, implement, and model effective problem solving and critical thinking skills. | |

| **Assessments (Formative)**<br>***To show evidence of meeting the standard/s, students will successfully engage within:*** | **Assessments (Summative)**<br>***To show evidence of meeting the standard/s, students will successfully complete:*** |
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| **<u>Formative Assessments:</u>**<br>● Entry and Exit Slips<br>● Quizzes<br>● Self Assessments | **<u>Benchmarks:</u>**<br>● Chapter Tests<br>● Projects<br>● LinkIT<br><br>**<u>Summative Assessments:</u>**<br>● District Assessments<br>● Midterms<br>● Standardized Tests |

| **Differentiated Student Access to Content:**<br>**Teaching and Learning *Resources/Materials*** | | | |
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| **Core Resources** | **Alternate Core Resources**<br>***IEP/504/At-Risk/ESL*** | **ELL Core Resources** | **Gifted & Talented Core Resources** |
| ● Textbooks websites<br>● Achieve the core<br>● Khan Academy<br>● Desmos<br>● GeoGebra | ● Skill building worksheets<br>● Math Manipulatives | ● Dictionary for native languages<br>● Videos in their native language. | ● Leveled Assessments<br>● Enrichment worksheets |

| **Supplemental Resources** |
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| **Technology:**<br>● **Chromebooks, Graphing Calculators, Online math manipulatives**<br>**Other:**<br>● **Zoom and Google Meets, Schoology, Interactive Textbooks, Private Tutoring** |

| **Differentiated Student Access to Content:**<br>**Recommended *Strategies & Techniques*** | | | |
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| **Core Resources** | **Alternate Core Resources**<br>***IEP/504/At-Risk/ESL*** | **ELL Core Resources** | **Gifted & Talented Core** |

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| • **Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat** | • **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 student to related** |

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| **NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS** | **Disciplinary Concept: Creativity and Innovation** | |
| | ***Core Ideas:*** | **With a growth mindset, failure is an important part of success** |
| | ***Performance Expectation/s:*** | **9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).** |
| | **Career Readiness, Life Literacies, & Key Skills Practices** | |
| | **Act as a responsible and contributing community member and employee.<br>Attend to financial well-being.<br>Consider the environmental, social and economic impacts of decisions.<br>Demonstrate creativity and innovation.<br>Utilize critical thinking to make sense of problems and persevere in solving them.<br>Model integrity, ethical leadership and effective management.<br>Plan education and career paths aligned to personal goals.<br>Use technology to enhance productivity, increase collaboration and communicate effectively.<br>Work productively in teams while using cultural/global competence.** | |

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