Standard - New Jersey Student Learning Standards: G-GMA
The Metric System (Chapter 7)

Strand
G-GMA: Geometric Measurement and Dimension

Explain volume formulas and use them to solve problems.

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.
2. (+) Give an informal argument using Cavalier's principle for the formulas for the volume of a sphere and other solid figures.
3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

Visualize relationships between two-dimensional and three-dimensional objects

4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotation of two-dimensional objects.

Curriculum aligned with: 2009 New Jersey Core Curriculum Content Standards for 21st Century Skills (9.1 A-F)

21st Century Theme: *Global Awareness* x*,Financial, economic, business and entrepreneurial literacy* ☐*,Civic literacy* ☐*,Health literacy* ☐*Environmental Literacy* ☐

21st Century Skills: *Critical Thinking & Problem Solving* ☐*,Creativity and Innovation* ☐*,Collaboration, Teamwork and Leadership* ☐*,Cross-Cultural Understanding and Interpersonal Communications X Communication and Media Fluency* ☐*,Accountability, Productivity and Ethics*

Interdisciplinary Connection: Math=MA, English=ELA, Science=SCI, Social Studies=SS, Physical Education=PE, Art=ART, Music=MU, Technology=TECH, World Language=WL, Business = BU

Essential Questions	Enduring Understandings	Activities, Investigation, and Student Experiences
1. What is the metric system and where is it used? 2. How do you convert using the metric system? 3. How do you analyze dimensional objects?	*Students will understand….* ● Basic Terms and Conversions within the Metric System ● Length, Area, and Volume ● Mass and Temperature	**<u>Task 1:</u>** A square meter is how many times larger than a square centimeter? **Answer:** A square meter is a square whose sides are 1 meter long. Since 1 meter equals 100 cm, we can replace 1 m with 100 cm. The area of 1 square meter = 1 m x 1m = 100 cm x 100 cm = 10,000 cm2. Thus, the area of one square meter is 10,000 times larger than the area of one square centimeter.

	● Dimensional Analysis and Conversions to and from the Metric System
Content Statements	**Cumulative Progress Indicators**
Students will know… ● The advantages of using the metric system. ● The basic units used in the metric system. ● Conversions within the metric system. ● Determining length, area, volume, mass, and temperature in the metric system. ● Dimensional analysis and converting to and from the metric system.	● Tests ● Quizzes ● Practice problems for homework ● Workbook pages ● Worksheets
Desired Results	

Task 2: SCI

A fish tank is 1 m long, to cm high, and 250 mm wide.

1. Determine the number of liters of water the tanks holds.
2. What is the mass of the water in kilograms?

Answer:

1. We must convert all the measurements to the same units. Lets convert them to meters.

50 cm = 0.5 m
250 mm = 0.25 m
so, V= 1 x 0.5 x 0.25 = 0.125m3
Since 1 m3 of water = 1 kl of water
0.125 m3 = 0.125 kl, or 125 liters.
Thus, the tank holds 125 linters of water.

2. Since 1 liter of water has a mass of 1 kg, 125 liters of water has a mass of 125 kg. thus the water in the fish tank has a mass of 125 kg.

Task 3:

A container contains 26 ounces of salt. Convert 26 ounces to pounds.

Answer:

$$(26oz)\left(\frac{1lb}{16oz}\right) = \frac{26}{16}lbs = 1.625lbs$$

- Basic Terms and Conversions within the Metric System
- Length, Area, and Volume
- Mass and Temperature
- Dimensional Analysis and Conversions to and from the Metric System

Standards for Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning 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.

Modifications and/or Accommodations:

- **Special Education:** 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.
- **English Language Learners:** Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of online bilingual dictionary, and modified assessment and/or rubric.
- **Students at Risk of School Failure:** Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat instructions as needed.
- **Gifted Students:** 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 talent development opportunities

Spot Light On: *Acknowledge every student's comment or response, even if it's incorrect.*

Teacher Resources

	Mymathlab.com http://achievethecore.org https://learnzillion.com https://www.khanacademy.org/ https://www.desmos.com/ http://www.ixl.com

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

- Wanda Diaz-Merced -

The mission is to ensure that every student is able to see themselves in our rich and diverse history.

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-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. • Recognize the skills needed to establish and achieve personal and educational goals. • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	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*