Curriculum Sample Template
Max. 8 Pages

Grade Level	3rd Grade	**Content Area**	Math
Course Title (grades 9-12 Only)	Mathematics 3		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	• Students understand how to work in precision partnerships effectively. • Students know how to use their math journals effectively. • Students are familiar with, and have used, the 8 CCSS mathematical practices.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	This unit is built on the framework of the SIOP Model and incorporates all 8 of the SIOP Model components. Sentence framing and precision partnering are instructional strategies which promote the use and mastery of academic language. Instructional technology is incorporated by teacher and students. The core curriculum is implemented with fidelity. All teachers also actively engage in rigorous questioning that uses the answer as the starting point, requiring students to use evidence and reasoning to justify how they found their answers and why they believe they are correct. A wide variety of algorithms and methods are honored, and process is highly valued. All math instruction grades K-8 explicitly teaches, models, and honors the 8 CCSS 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		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	Domain: Measurement and Data Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. Standard: #2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word		

	problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
Materials/Resources Needed	• SMART Board • Root beer • Ice cream, scoop, and 25 cups • Beakers marked with liter and milliliter • Gram and kilogram weights • Paperclips • Scales • Volume lab sheets • Transparent containers • Orange, green, and red liquids • Whiteboards and markers for students • Summative assessments

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	Instructional Strategies	Student Activities
1	Unit Vocabulary: **mass** **volume** **liter** **grams (g)** **kilograms (kg)** 1. Teacher quietly pours a bright red liquid from a transparent pitcher into a transparent measuring cup, portions out 2 cups, and pours 2 cups into each of five differently-shaped, transparent containers. Teacher asks the question: "What did you see?" and asks students to discuss this and write down their answers on whiteboards. 2. Teacher solicits partnership findings. 3. Teacher presents the words **volume**, **liter**, and **milliliter and** prompts students to add them to their vocabulary journals, and asks partnerships to revise their statements using these words. Teacher shares the conversion site: http://www.metric-conversions.org/volume/milliliters-to-liters.htm and uses it to guide a conversion prediction discussion and a decimal/place value review. 4. Teacher puts students into groups of four and introduces the 4 'stations' students will rotate through for the 'liter lab'. 5. Teacher facilitates the lab.	1. Student partnerships access prior knowledge and working vocabulary to describe: "What did you see?" and complete their whiteboard answers. 2. Partnerships share their findings with the class. 3. Students add new vocabulary definitions, pictures, and sentences/examples into their vocabulary journals. Students make notes about the place value conversion/relationship between milliliters and liters. 4. Students rotate in groups of four through four 'liter lab' stations. In these stations, students are asked to blindly estimate a liter by pouring a bright orange liquid into a transparent vessel (each of the four stations has a different shape). 5. Once the group 'agrees' on their estimation, the teacher provides an exact vessel that has liter and milliliter marks. Students must provide the following: Container: | Estimated Volume: | Volume Goal: 6. Each group must record their results and modify their vessel to match the 1 liter model.
2	1. Teacher places a new, unmarked, transparent vessel at the front of the room and asks partners to predict where the 1 liter mark is with a sticky note. Teacher then fills the vessel with a bright green liquid and gives a prize to the closest partnership. 2. Teacher asks students to write a one-sentence summary that reflects yesterday's predictions with a one-sentence follow-up that offers evidence to support their summary. 3. Teacher offers an example of one group's single-station	1. Students predict the volume of a liter using an unmarked vessel. 2. Students review their data from the prior day and write a group summary that encapsulates their predictive powers and provide evidence to justify their assertion. 3. Partners review one group's findings from the prior day and determine the difference between the liter goal and the group's performance. Using a sentence frame,

	performance: Container #2; Volume Goal: 1 liter; Estimated Volume: 750ml and asks student partners to explain how far off this prediction was using this sentence frame: **This group's prediction missed the 1 liter target by _____.** 4. Teacher will have students share their sentence frames and will honor correct answers in both liters and milliliters to support the conversion work from the prior day. 5. Teacher will ask student partners to review their findings from the lab and complete the above sentence frame for each of the four stations. 6. Teacher gives a real world problem for the next day: If the whole class is going to enjoy root beer floats tomorrow, how many liters of root beer does she need to bring to class? Students are able to ask questions as they identify data they need to make an accurate prediction.	students communicate their findings. 4. Student partners complete sentence frames for their findings from all four stations the prior day. 5. Students make root beer predictions for the next day.
3	1. Teacher sets out 2 liter containers of root beer in the front of the room and projects each group's liter prediction from the day before. 2. Teacher fills one cup (measuring 250 ml) to the top, multiplies 250x25=6,250=6.25 liters and moves to award the group with the answer closest to that amount . . . waiting for someone to stop her, point out her errors, and ask the ice cream question. 3.Teacher asks the essential question: "How can we quantify the 'space' the ice cream will need so that we can determine how much root beer we are going to use?" 4. Teacher gives each group an ice cream scoop, ice cream, a beaker, and 250 ml cups to help answer the essential question. 5. Teacher pours root beer into every student's cup to celebrate their mathematical work so far. Once she is done, she 'shows' students the empty 2 liter bottles and the class identifies the prediction 'winner' from the prior day. 6. Teacher asks these questions: 1:"How many liters of ice cream did the class use to make our	1. Students watch the initial root beer measurement set up, calculation, and conversion . . . and hopefully realize and point out the error: no 'space' is saved for the ice cream. 2. Student groups discuss the essential question and offer their solution to the class. 3. Students use tools (cups, ice cream, beaker) to answer the essential question. 4. Students scoop ice cream into each of their cups and share their findings with the class. 5. Students 'see' the root beer answer to the question by looking at the empty root beer 2 liters. 6. Students determine the volume of ice cream used by the whole class. 7. Students determine the total volume of ice cream AND root beer consumed by the whole class.

	floats?” 2: “How many total liters of ice cream AND root beer did this class consume?”	
4	**Vocabulary:** **mass** **grams (g)** **kilograms (kg)** 1. Teacher presents the words **mass**, **grams (g)**, and **kilograms (kg) and** prompts students to add them to their vocabulary journals, and asks partnerships to revise their statements using these words. Teacher shares the conversion site: http://www.metric-conversions.org/weight/grams-to-kilograms.htm?val=100 and uses it to guide a conversion prediction discussion and a decimal/place value review. 2. Teacher will demonstrate how to use the scales and guide students through a practice run using a gram weight and a paperclip. 3. Teacher will provide five objects for students to predict and measure mass: unsharpened pencil, Hershey’s kiss, an apple, and a shell. 4. Teacher will provide students with three comparative sentence frames to communicate their findings. **The _____ had a mass that was five times that of the _____.** **The _____ weighed less than the _____.** **The _____ difference in weight between the _____ and the _____ was _____.**	1. Students add new vocabulary definitions, pictures, and sentences/examples into their vocabulary journals. Students make notes about the place value. conversion/relationship between milliliters and liters. 2. Students hold gram and kilogram weights in their hands to serve as a reference for lab work and predictions. 3. Students hold gram weights and paperclips in each hand to make a comparison. 4. Students will practice using their scales, initially, with a gram weight and a paperclip. Once they have the mechanics down, students will work in pairs to make, research, and record their predictions about mass using: unsharpened pencil, Hershey’s kiss, an apple, and a shell. 5. Students will provide framed comparative responses to communicate their findings to the class: **The _____ had a mass that was five times that of the _____.** **The _____ weighed less than the _____.** **The _____ difference in weight between the _____ and the _____ was _____.**
5	1. Teacher asks the question: “How would it have been helpful to know the **weight** of the ice cream used in our root beer floats to determine how many **liters** of root beer was needed? 2. Give summative assessment for unit.	1. Students discuss the connection between mass and volume and share their thoughts with the class. 2. Take the summative assessment independently.

Summative Assessment Items: *Attach here.*

Measurement and Data Using Volume and Mass Quiz

Domain: Measurement and Data

Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Standard: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg) and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g. by using drawings (such as a beaker with a measurement scale) to represent the problem.

Essential Student Question: Can you measure and estimate liquid volumes and masses of objects?

1.See the ad on the right for a sale on 2 liter bottles of Coke. How much will you pay for a single liter, and how do you know?

a. $1.58; you would take the price of a 2 liter and double it to determine the cost of a single liter.
b. $.395; you would take the price of a 2 liter and divide it in half to determine the cost of a single liter.
c. $1.19; you would take the price of a 2 liter and add half of it to determine the cost of a single liter.
d. $3.16; you would take the price of a 2 liter and multiply it by four to determine the cost of a single liter.

2. Based on the 'liter meter' to the right, which best describes the relationship between two measurements?

a. A cup is much smaller than a liter; at least four cups could fit into a full liter.
b. A liter is much larger than a quart; at least two quarts could fit into a full liter.
c. A pint is a little bit smaller than a liter; you couldn't fit two pints into a full liter.
d. A half liter is still larger than a cup; you could fit about four cups into a half liter.

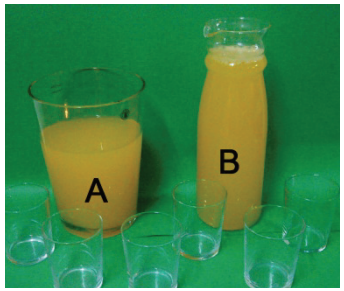
3. Using the beaker on the left, identify which statement best represents the green liquid's volume:

a. It is 850 ml, equal to .85 liters.
b. It is 800 ml, equal to .80 liters.
c. It is 1000 ml, equal to 1.0 liters.
d. It is 900 ml, equal to .90 liters.

4. Again, use the beaker on the left and identify which statement best represents the green liquid's volume:

a. It is .85 liters.
b. It is .80 liters.
c. It is 1.0 liters.
d. It is. 90 liters.

5. Using the picture on the right, explain how A and B contain the exact same volume of liquid:



6. Looking at the scale to the left, what estimate could you provide about the mass of the sliced turkey?
a. It most likely weighs 2.65 kilograms.
b. It most likely weighs 2.65 grams.
c. It most likely weighs 26.5 kilograms.
d. It most likely weighs .265 grams.

7. See the tomato being weighed on the right. If a recipe calls for 4 kg of tomatoes, how many will you need to buy in total?
a. 4
b. 3
c. 2
d. 1

8. A kilogram is, roughly, .45 of a pound. The world's largest pizza (according to Guiness), had a mass of 26,833 pounds. About how many kilograms would that be?
a. 13,500 kg
b. 15,000 kg
c. 12,000 kg
d. 10,000 kg

Measurement and Data Using Volume and Mass Quiz Answer Key

1. B
2. A
3. D
4. D
5. Because the volume of space the juice occupies remains the same . . . even when a container's shape changes. The taller and more narrow container (B) just looks like it has more juice because the liquid seems to go 'higher'.
6. B
7. A
8. A

Measurement and Data Using Volume and Mass Quiz Scoring Guide

8 questions weighted at 1 point each **8 points total**

Raw score_____X____/10 = _____/100 points

The 100 points possible assessment will reflect the school's grading scale:

90 -100 = A – Mastery

80 – 89 = B - Mastery

70 – 79 = C – Needs Screening for Remediation

60 – 69 = D – Needs Remediation

0 – 59 = F – Needs Intensive Remediation