Curriculum Sample Template
Max. 8 Pages

Grade Level	3	**Content Area**	Math
Course Title (grades 9-12 Only)	N/A		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	At this point in the year, students are familiar with addition, subtraction, multiplication, and division word problems and have used bar models to solve these types of word problems. Students have also developed skills to solve multiplication and division facts and are developing their fluency with these facts. Additionally, students have prior experience with estimation and have a working knowledge of the metric system. Students also have been introduced to the terms mass and volume in prior units.		
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.*	These math lessons will serve as the "Math Content Lesson" as described in the Program of Instruction. A large focus for math content lessons is developing conceptual understanding, which is accomplished in these lessons through the variety of hands-on activities and through drawing pictures and bar models to help students develop a deep understanding of liters, grams, and kilograms. These lessons follow the direct instruction model, including setting a purpose for learning, introduction to new material, guided practice, independent practice, and closure. Additionally, these lessons use authentic approaches as they utilize materials that students interact with on a daily basis and set an authentic purpose for learning each day.		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	Grade: 3 Domain: Measurement & Data (MD) 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. 3.MD.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	1-L beakers, a variety of different sized containers (i.e. a dog's water bowl, vase, water bottle, cooking pot etc.), water, post-its, pan balance, gram and kilogram masses, classroom objects (i.e. crayon, eraser, scissors etc.), worksheets, student directions for activities		

* ***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	**Objective**: Students will be able to estimate and measure liquid volume in liters. **Introduction to New Material (15 minutes):** Teacher tells students that today we will explore the following question: "How can you estimate and measure liquid volume in metric units?" Teacher will instruct students to work with their shoulder partners to begin finding the answer to this question by completing the exploration activity. Teacher will provide written instructions and other materials to students and will circulate as students complete the activity, asking probing questions. Teacher will bring students back together and guide the discussion surrounding the exploration activity, eventually leading students to the conclusion that although the shape of the water changes based on the size and shape of the container it is in, 1 liter is a constant amount. Teacher guides a discussion surrounding why it is important for us to understand how big 1 liter is (because it is a skill we need to make educated decisions in life). Teacher will show students three containers, a glass, a water bottle, and a fish bowl. Teacher, with input from students, will place the containers in order from the one he/she thinks will hold the least water to the one he/she thinks will hold the most. The teacher looks at the 1-liter beaker and with input from students, estimates the volume of each container in liters. The teacher documents this on an organizer. The teacher then uses the 1-liter beaker to discover that a full glass of water holds less than 1 liter, that a water bottle holds about 1 liter, and that a fish bowl holds more than 1 liter. The teacher documents this on the organizer and discusses the results with students, guiding student thinking. **Guided Practice (10 minutes):** Teacher tells students that they will continue to explore how many liters various containers can hold so they will further shape their understanding of how big one liter is. Teacher provides written directions and materials to students and instructs students to begin	Students will listen actively. Students will complete the following exploration activity. As students work, they will discuss the activity, answering the questions in step four, and answer any additional questions the teacher poses while circulating. • **Step 1:** Fill a 1-liter beaker with water to the 1-liter mark. • **Step 2:** Pour 1-liter of water into a container. Mark the level of the water with a post-it. Draw the container on your guided notes. • **Step 3:** Repeat steps 1 and 2 with different-sized containers. • **Step 4:** Describe the four containers. What can you say about the amount of liquid volume that is in each container? Which containers are mostly empty? Which containers are mostly full? Students will discuss the exploration activity as prompted by the teacher. Students will come to the conclusion that although the shape of the water changes based on the size and shape of the container it is in, 1 liter is a constant amount. Students discuss why it is important to understand how big one liter is. Students will look at the three containers and help the teacher order the containers from the one they think will hold the least water to the one they think will hold the most. Students assist teacher in estimating the volume of each container in liters. Students observe the teacher and listen actively. Students listen actively to teacher directions. Then students gather needed materials and begin the guided exploration with their partners. As students work, they discuss the activity, questions they have, and answer any questions the teacher asks as he/she circulates.

	working with their partners. Teacher circulates as students work to check for students understanding and ask probing questions such as: *When estimating, how did you decide in which order to list the containers? Why might it be important to measure the liquid volume of containers when comparing them? After measuring, how did you decide in which order to list the containers?* Teacher pulls students back together and has students get out a post-it note and number it one through two. Teacher holds up two different containers (that have not yet been used in the lesson). Teacher instructs students to use what they have learned about liters to estimate how many liters the two containers would hold. Teacher has students write their estimates on their post-it notes. **Independent Practice (15 minutes):** Teacher collects post-it notes to use as final check for understanding. Teacher then releases students to complete the independent practice worksheet where they are asked to estimate the capacity of a variety of pictured objects using *more than 1 liter*, *less than 1 liter*, and *about 1 liter*. Meanwhile, teacher, using data from post-it notes, will pull a small group of students who have not quite mastered the objective and work with them further in guided practice to ensure they master the objective. Once students demonstrate mastery, teacher releases them to independent practice. **Closure (5 minutes):** Teacher pulls the class back together. Teacher prompts students to discuss the question *How can you estimate and measure volume in metric units?* with their partners. Teacher circulates quickly to listen to responses. Teacher asks several students with exemplar responses to share with the class.	Students complete the following steps: • **Step 1:** Write the containers in order from the one you think will hold the least water to the one you think will hold the most water. • **Step 2:** Estimate how much each container will hold. Write *more than 1 liter, about 1 liter,* or *less than 1 liter* in the table. • **Step 3:** Pour 1 liter of water into one of the containers. Repeat until the container is full. Record the number of liters you poured. Repeat for each container. • **Step 4:** Describe the four containers. What can you say about the amount of liquid volume that is in each container? Which containers are mostly empty? Which containers are mostly full? Students write one through two on a post-it note. Students look at containers teacher is holding. Students estimate how many liters each of the containers will hold and write their answers on their post-its. Students give post-its to teacher. Students complete independent practice worksheet where they are asked to estimate the capacity of a variety of pictured objects using *more than 1 liter*, *less than 1 liter*, and *about 1 liter*. Students who have not yet demonstrated mastery of the objective work with the teacher in further guided practice. Once students demonstrate mastery, they complete the independent practice worksheet. Students discuss the question *How can you estimate and measure in metric units?* with their partners. Students with exemplar responses share with the class. Students listen actively while other students share.
2	**Objective:** Students will be able to estimate and measure mass in grams and kilograms. **Introduction to New Material (10 minutes):** Teacher tells students that today we will be exploring the question *How can you estimate and measure mass in metric units?* Teacher explains that grams and kilograms can help students with real-world situations, such as with grocery items. Also, in the scientific field, research and experiments are conducted using metric units of mass	Students listen actively. Students hold up a paperclip and book and compare the weight, discussing the differences in weight with their partners.

	so today's lesson will help to prepare them for this. Teacher explains that today we will be estimating and measuring objects' weights (or mass) in grams and kilograms. Teacher holds up a paperclip and a book and explains that a paperclip weighs about one gram and a book weighs about one kilogram. Teacher directs students to pick up a paperclip while holding a book in the other hand (these objects are already located on student tables). Teacher asks students to describe the difference in weight to a partner. Teacher tells students that today they will choose the appropriate unit of measurement—grams or kilograms to estimate and measure a variety of different objects based on what they know about the weight of a gram and a kilogram.	
	Teacher models estimating and measuring the weights of several different objects using the following process: Teacher models choosing grams or kilograms and explaining his/her reasoning for the chosen unit. Then teacher estimates the weight of the object and explains reasoning. Last, teacher models how to use a scale balance to measure the object using the chosen unit, placing the object on one side of the balance and gram/kilogram weights on the other side of the balance until the objects are even. Teacher records the responses in a table.	Students actively listen to the teacher's model.
	Guided Practice (20 minutes):	
	Teacher informs students that they will now practice estimating and measuring the weights of objects in grams and kilograms with their partners. Teacher directs students to work with their partners to decide if objects should be measured in grams or kilograms, estimate the mass or weight of each object, find the mass of each object by balancing the object on the scale, and calculate the total weight of the object. Teacher will circulate as students work, asking probing questions and assisting students as necessary. Teacher will make note of students who are able to successfully choose the correct unit of measurement and estimate and measure an object's mass. Through these observations, the teacher will determine which students need additional practice with the objective.	Students will listen actively. Students will work with their partners to decide if objects should be measured in grams or kilograms, estimate the mass or weight of each object, find the mass of each object by balancing the object on the scale, and calculate the total weight of the object. Students will respond to the teacher's questions.
	Independent Practice (10 minutes):	
	Teacher will direct students to complete the independent practice worksheet, where students must choose the correct unit of measurement (grams or kilograms), choose the best estimate for the object's weight, and demonstrate an understanding of measuring	Students will complete the independent worksheet, choosing the correct unit of measurement (grams or kilograms), choosing the best estimate for the object's weight, and demonstrating an understanding of

	objects' weights based on a scale balance. While students complete the independent practice, the teacher will work with the group of students who have not demonstrated mastery and who require additional support with the objective. Teacher will work with these students further in guided practice and release students to independent practice as they demonstrate mastery of the objective. **Closure (5 minutes):** Teacher will bring students back together. Teacher directs students to think-pair-share with their partners to answer the question *How can you estimate and measure mass in metric units?* Teacher chooses several students with exemplar responses to share with the class.	measuring objects' weights based on a scale balance. Students who did not demonstrate mastery of the objective during guided practice will work with the teacher in a small group. As students demonstrate mastery, they will complete the independent practice as directed by the teacher. Students will think-pair-share with their partners to answer the question *How can you estimate and measure mass in metric units?* Students will share their responses as directed by the teacher. Students who are not sharing will listen actively.
3	**Objective:** Students will be able to add, subtract, multiply, or divide to solve one-step word problems involving liquid volumes or masses that are given in the same unit by using drawings to represent the problem. **Introduction to New Material (10 minutes):** Teacher will inform students that today we will be building off of our knowledge of estimating and measuring liquid volumes and masses to solve one-step word problems. Teacher tells students that in real life, we must be able to measure liquids and masses *and* use those measurements to solve problems and today's lesson will help us to do this successfully. After setting the authentic purpose for the lesson, the teacher will have students look through the capacity containers and gram and kilogram masses already placed on their tables. Teacher will direct students to review the measurement objects with their partners using academic vocabulary (liters, grams, and kilograms). As students work, teacher will circulate quickly to ensure students have a good understanding of the vocabulary words and how they are used correctly. Teacher will bring the class back together and model how to solve one-step word problems involving liquid volumes or masses that are given in the same unit by drawing to represent the problem. Teacher will prompt student responses to questions as appropriate. Example problem the teacher will model: A restaurant serves iced tea from a large container that can hold 24 liters. Sadie will fill the container with 4 different pitchers. Each pitcher holds 7 liters. Will	Students listen actively while teacher sets the purpose for the lesson. Students look through capacity containers and gram and kilogram masses on their tables. Students review the measurement objects using academic vocabulary (liters, grams, and kilograms). Students will listen actively as teacher models. Students will respond to the teacher's questions as appropriate.

	Sadie have tea left over after filling the container?
	• Model:
	  ○ The teacher will ***visualize*** the problem by drawing measurement tools of 4 pitchers with 7 liters in each.
	  ○ The teacher will use a ***bar model*** to represent this information. The teacher will draw 4 bars with 7 written in each bar.
	  ○ "Since there are 4 equal groups of 7 liters, I can multiply."
	  ○ Teacher writes the equation ***4 x 7 = 28***.
	  ○ 28 liters is ***greater than*** 24 liters. So, Sadie ***will*** have tea left over.
	Teacher will model several more problems that require use of the various operations and grams, kilograms, and liters.	

	Guided Practice (15 minutes): Together, teacher and students will practice a variety of one-step word problems using addition, subtraction, multiplication, and division involving liquid volumes and masses. Teacher will direct students to complete the problems on their whiteboards, gradually releasing more responsibility to the students and checking student whiteboards after each step within a problem. If students demonstrate confusion, the teacher will back up and explain the problem in a different way to ensure student understanding. Additionally, the teacher will direct students to explain their thinking to partners after various steps of each problem as appropriate. Teacher will pose one final question for students to complete independently on their whiteboards. Teacher will scan whiteboards quickly, noting any students who did not master the final check for understanding.	Students practice a variety of one-step word problems using addition, subtraction, multiplication, and division involving liquid volumes and masses. Students complete problems on their whiteboards as directed by the teacher. Students will explain their thinking to their partners as directed by the teacher. Students will complete the final question independently on their whiteboards and show the teacher.
	Independent Practice (17 minutes): Teacher will direct students to complete the independent practice worksheets on their tables using the skills they have just practiced throughout the lesson. The worksheets contain more one-step problems that require use of addition, subtraction, multiplication, and division and involve liquid volumes and masses. While the majority of students are working independently, teacher will work with a small group of students who did not get the final check for understanding problem correct. Teacher will work with students	Students will complete the independent practice worksheets that contain more one-step problems that require use of addition, subtraction, multiplication, and division and involve liquid volumes and masses using the steps they just practiced with the teacher. Students who have not demonstrated mastery of the objective work with the teacher in further guided practice. Students will complete the independent practice after demonstrating mastery of the objective.

	further in guided practice, releasing students to independent practice as soon as students demonstrate mastery of the objective. **Closure (3 minutes):** Teacher brings the class back together. Teacher asks students to explain to a partner how using models to solve liquid volume and mass problems can help them in real life. Teacher has several students with exemplar responses share with the class.	Students explain to their partners how using models to solve liquid volume and mass problems can help them in real life. Students with exemplar responses share with the class as directed by the teacher. Students listen actively while other students share out.
4	**Assessment:** 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. **5 minutes:** Teacher explains that today we will have the opportunity to show all that we have learned this week about measuring and estimating liquid volumes and masses and how to solve one-step word problems. Teacher reminds students that these skills will help them to be successful throughout their lives. Teacher sets expectations for the assessment. **40 minutes:** Teacher directs students to complete the assessment. Teacher walks around to monitor student progress but teacher does not assist students with anything related to the objective.	Students listen actively. Students complete assessment independently.

Summative Assessment Items: *Attach here.* For each summative assessment item, include an answer key or scoring rubric describing how points are to be awarded.

Summative Assessment and Answer Key:

*Each problem on the assessment on page eight is worth one point. Answers are indicated in bold in throughout the assessment. Students must earn 11 out of 12 points (92%) to demonstrate mastery. (The bar of mastery at CASA Academy is 85% or higher. However, for this assessment, it is not possible to earn exactly 85%.)

1. Pam's dogs have masses of 25 kilograms and 21 kilograms. What is the total mass of Pam's dogs?
   A. 4 kilograms
   B. 40 kilgrams
   C. 46 kilograms
   D. 51 kilograms

2. Which is closest to the mass of a marker?
   A. about 1 kilogram
   B. about 1 gram
   C. about 20 kilograms
   D. about 20 grams

3. Trisha put a glass of water on a scale. She then added weights until the scale balanced. She added a 1,000 gram weight and a 500 gram weight. What is the mass of the glass of water, in grams?
   1,500 grams

4. Which object has a mass of about 2 kilograms?
   A. a book
   B. a spoon
   C. a car
   D. a penny

5. Adele buys 4 liters of orange juice and 7 liters of cranberry juice. How many liters of juice does Adele buy in all?
   11 liters

6. A paperclip has a mass of about 1 gram. What is the mass of 10 paper clips?
   about 10 grams

7. George baked some cookies and packed them into 3 gift boxes that each had a mass of 300 grams. What is the total mass of all 3 boxes of cookies?
   900 grams

8. A chef makes 36 liters of soup and packages it in 18 equal containers. How much does each container hold?
   A. 1 liter
   B. 2 liters
   C. 12 liters
   D. 18 liters

9. Mr. Abrams filled 24 sandbags with sand. Each filled bag had a mass of about 3 kilograms. Which is closest to the total mass of all of the sandbags?
   A. 27 kilograms
   B. 60 kilograms
   C. 72 kilograms
   D. 82 kilograms

10. Kyle bought 48 1-liter bottles of water. He sold 29 bottles to parents and visitors at a soccer game. How much water did Kyle have left?
   A. 77 liters
   B. 67 liters
   C. 19 liters
   D. 18 liters

11. Which object has a mass of about 15 kilograms?
   A. a basketball
   B. a shoe
   C. a bike helmet
   D. a bike

12. Which is the **most reasonable** estimate for the amount of water in a full bathtub—2 liters, 20 liters, or 200 liters?
   200 liters