**MCC. 3.MD.2 (Mass and Volume)**

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.

**ENDURING UNDERSTANDINGS**

*Mass and Volume…*

● Mass and volume are important parts of everyday life and can determined a variety of ways.

● Larger units can be subdivided into equivalent units (partition).

● The same unit can be repeated to determine the measure (iteration).

● There is a relationship between the size of a unit and the number of units needed (compensatory principle).

**ESSENTIAL QUESTIONS**

*Volume and Mass…*

● What happens when your units of measure change?

● Why is it important to know the mass of an object?

● In what ways can we determine the mass of an object?

● What is the difference between a standard and non-standard unit of measurement?

● What units are appropriate to measure mass?

● How are units in the same system of measurement related?

● What strategies could you use to figure out the mass of multiple objects?

● What happens to an item’s measurement when units are changed?

● About how heavy is a kilogram?

● What items in the classroom weigh close to a kilogram?

● How are grams and kilograms related?

● What everyday items weigh about a gram? About a kilogram?

● What is the tool best to use when measuring liquid volume?

● What connection can you make between the volumes and your everyday life?

● Does volume change when you change the measurement material? Why or why not?

● How can estimating help me to determine liquid volume?

● What are some ways I can measure the liquid volume?

**STRATEGIES FOR TEACHING AND LEARNING**

● Provide opportunities for students to use appropriate tools to measure and estimate liquid volumes in liters only and masses of objects in grams and kilograms. Students need practice in reading the scales on measuring tools since the markings may not always be in intervals of one. The scales may be marked in intervals of two, five or ten.

● Allow students to hold gram and kilogram weights in their hand to use as a benchmark. Use water colored with food coloring so that the water can be seen in a beaker.

● Students should estimate volumes and masses before actually finding the measuring. Show students a group containing the same kind of objects. Then, show them one of the objects and tell them its weight. Fill a container with more objects and ask students to estimate the weight of the objects.

● Use similar strategies with liquid measures. Be sure that students have opportunities to pour liquids into different size containers to see how much liquid will be in certain whole liters. Show students containers and ask, “How many liters do you think will fill the container?”

**EVIDENCE OF LEARNING**

By the conclusion of this unit, students should be able to demonstrate the following competencies:

*Mass and Volume…*

● Reason about the units of mass and volume and demonstrate a basic understanding of the size and weight of a liter, a gram, and a kilogram.

● Solve one-step word problems about mass and volume that include the same units.

**LEARNZILLION:**

<https://learnzillion.com/lessonsets/754-measure-and-estimate-mass-and-volume-of-liquids-and-use-results-to-solve-problems>

<https://learnzillion.com/lessonsets/359-solve-word-problems-about-mass-and-volume>

<https://learnzillion.com/lessonsets/283-measure-and-estimate-liquid-volumes-and-masses-of-objects>