Grade 3

Unit	Unit Title	Lesson	Day
4.1	Measurement – Liquid Volume	1 of 3	1

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). [6] 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.[7] [6]Excludes compound units such as cm^3 and finding the geometric volume of a container. [7]Excludes multiplicative comparison problems (problems involving notions of "times as much"	Estimate and measure liquid volume in liters.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	How can you estimate and measure liquid volume in metric units?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Use the terms *about, less than*, and *more than* to compare amounts to a standard amount. •Add, subtract, multiply, and divide to solve problems. •Use a bar model to represent a problem situation. •Write an equation to represent a problem situation.	Liquid volume Liter (L)		**OnCore** Lessons 76 and 78 Student pp. 151-152 and 156 (Student p.155 done in unit 2.1 with measuring volume)

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to estimate and measure liquid volume and solve problems about liquid volume and mass following the lesson guidelines in lessons 76 and 78 (TM pp 81-82), teachers will: Remind students that a meter is a unit for measuring length in the metric system. Have students estimate lengths of several objects, using the phrases *about a meter, less than a meter*, and *more than a meter.* Discuss the terms liquid volume and liter and guide students through the example. The water bottle is an everyday object that helps to understand about how much liquid is in a liter. Discuss why the estimates for the other objects are reasonable; more than a liter because it would take more than one water bottle to fill it. When solving problems discuss how using a bar model can help them decide on an appropriate equation.	In Lessons 76 and 78 students will: • Estimate how much liquid volume there would be in a container when it is filled. They will answer *about a meter, less than a meter*, and *more than a meter.* •Write an estimate and solve a problem about liquid volume and mass. •Label their answers using grams, kilograms, and liters. •Complete Student pp. 151-152 and 156.

Grade 3

Unit	Unit Title	Lesson	Day
4.1	Measurement – Liquid Volume	2 of 3	2-4

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). [6] 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.[7] [6]Excludes compound units such as cm^3 and finding the geometric volume of a container. [7]Excludes multiplicative comparison problems (problems involving notions of "times as much"	Understand measures of liquid volume. Estimate and measure liquid volume Solve story problems involving liquid volume.	**SMP1** Make sense of problems and preserve in solving them. **SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically.	How do you estimate liquid volume or masses of objects using standard units?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
	Liquid volume Milliliter (mL) Liter (L)	•Volume in this investigation focuses only on liquid volume. Students should also know that volume can refer to the amount of space a solid object takes up. •Misconceptions occur when children compare the volume of liquid in two containers. Children often believe that the amount of liquid is more in the one that has the highest level. This happens because fluids take the shape of their container and they appear to be different when actually the volume is the same. Students make a comparison on height rather than capacity.	**Investigations** Unit 9 Snap-In 4A.1 Student pp. 62-64

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will be following lesson activities from session 4A.1 in the Unit 9 Investigations Snap-In materials. (TM CC73-75) In the activities teachers will: Provide groups of students a teaspoon, a small jar, a liter bottle, and a pitcher of water to learn about measuring the volume of liquids and to discover that 100 mL of water is still 100 m of water no matter what size container it is poured into. Provide groups of students a 100 mL cylinder and a pitcher of water. Have students take turns adding some water to the measuring cylinder. The rest of the group determines the volume of the water in the cylinder.	In Investigations Snap-In 4A.1 students will: •Measure the volume of liquids using a 100 mL cylinder and a pitcher of water. • Determine measurements that are likely for objects given. •Estimate and measure the volume of liquids. Solve story problems about liquid volume. •Complete student pages C 62-C64.

Grade 3

Unit	Unit Title	Lesson	Day
4.1	Measurement – Liquid Volume	3 of 3	5-7

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). [6] 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.[7] [6]Excludes compound units such as cm^3 and finding the geometric volume of a container. [7]Excludes multiplicative comparison problems (problems involving notions of "times as much"	Understand measures of liquid volume and weight and mass. Estimate and measure liquid volumes and weight and mass. Solve story problems involving liquid volumes and weight and mass.	**SMP1** Make sense of problems and preserve in solving them. **SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically.	How can you estimate and measure liquid volume in metric units?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
	Mass Gram (g) Kilogram (kg) Liquid volume Milliliter (mL) Liter (L)	Volume in this investigation focuses only on liquid volume. Students should also know that volume could also refer to the amount of space a solid object takes up. •Misconceptions occur when children compare the volume of liquid in two containers. Children often believe that the amount of liquid is more in the one that has the highest level. This happens because fluids take the shape of their container and they appear to be different when actually the volume is the same. Students make a comparison on height rather than capacity.	**Investigations** Unit 9 Snap-In 4A.3 Student pp. C 68-C69

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will be following lesson activities from session 4A.3 in the Unit 9 Investigations Snap-In materials. (TM CC81-CC84) In the activities teachers will: Write a measurement story problem on the board, read it aloud, and ask students to talk through the problem and discuss what it's asking. Then ask students to suggest an equation that represents the problem. Give two examples, one for liquid volume and one for weight and mass.	In Investigations Snap-In 4A.3 students will: •Explain what they know about liquid volume and weight and mass. • Determine measurements that are likely for objects given. •Find the liquid volume of measuring cylinders. Solve story problems about liquid volume and weight and mass, and include units in their answer. •Complete student pages C 68-C69