Bridging for Math Strength Resources

Standards of Learning Curriculum Framework

Standard of Learning (SOL) 3.7b Estimate and measure liquid volume in cups, pints, quarts, gallons, and liters



Student Strengths	Bridging Concepts	Standard of Learning
Students can use nonstandard units to measure liquid volume.	Students can choose appropriate tools for measuring liquid volume. Students can use benchmarks to make meaningful estimates of liquid volume.	Students can estimate and measure liquid volume in cups, pints, quarts, gallons, and liters.

Understanding the Learning Trajectory

Big Ideas:

- Volume measurements can be estimated using appropriate known referents (Charles pg. 22).
- Benchmarks of common objects need to be established for each of the specified units of measure (cup, pint, quart, gallon, liter). (VDOE Curriculum Framework)
- Liquid measurement can be represented with one-dimensional scales. Problems may be presented with drawings or diagrams, such as measurements on a beaker with a measurement scale in milliliters (Common Core Progressions, pg. 19).

Formative Assessment:

- VDOE Just in Time Mathematics Quick Check 3.7b (PDF)
- VDOE Just in Time Mathematics Quick Check 3.7b (Desmos)

Important Assessment Look Fors:

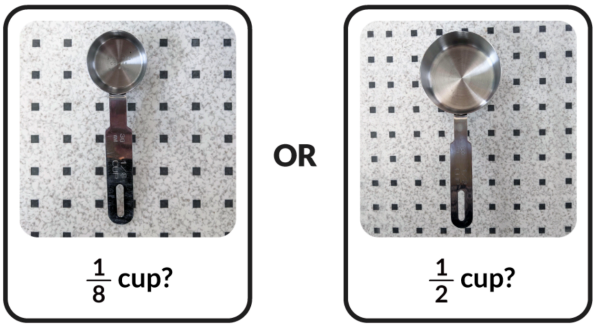
- Student recognizes and uses the scales on the containers (when appropriate).
- Student measures the liquid volume by using the appropriate unit of measure.
- Student understands that larger containers hold more water than smaller containers.

Purposeful Questions:

- Why did you choose that unit of liquid volume for that specific container?
- Explain how you got _____ for the liquid volume of that container.

Copyright ©2021 by the Commonwealth of Virginia, Department of Education, P.O. Box 2120, Richmond, Virginia 23218-2120. All rights reserved. Except as permitted by law, this material may not be reproduced or used in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, without written permission from the copyright owner. Commonwealth of Virginia public school educators may reproduce any portion of these items for non-commercial educational purposes without requesting permission. All others should direct their written requests to the Virginia Department of Education at the above address or by e-mail to vdoe.mathematics@doe.virginia.gov.

- What is the scale (if appropriate) for the container? Explain how you know.

Bridging Activity to Support Standard	Instructional Tips
Routine Collaborative Estimates for Volume Adapted from Theresa Wills routine Would You Rather: Slime Time Math in Our World: Watering Flowers	Students will use pictures, models, words, numbers or symbols to justify their choice. **Suppose you want to make slime.** **Would you rather measure 1 cup of glue with …** 
Rich Tasks Liquid Volume Sort Henrico County Public Schools	
Games Matching/Go Fish	These cards can be used as a matching game or Go Fish. Teachers can add or substitute cards to best fit their classroom. For example, the benchmarks can be changed to more familiar ones, the measurements to target particular areas of understanding, or pictures of authentic classroom objects and measurements can be added.

Other Resources:

- Anchor chart Henrico County Public Schools
  - Create an anchor chart (it does not have to be this exact one) and use it daily to discuss liquid volume units and their sizes. Have examples of a real cup, pint, quart, gallon, and liter in the classroom.
- VDOE Mathematics Instructional Plans (MIPS):
  - 3.7b - Measuring Liquid Volume (Word) / PDF Version
- VDOE Word Wall Cards: Grade 3 (Word) and (PDF)

Learning Trajectory Resources:

Charles, R. (2005). Big ideas and understandings as the foundation for elementary and middle school mathematics. *Journal of Mathematics Education Leadership*, *7*(3), NCSM.

Clements, D. H., & Sarama, J. (2019). Learning and teaching with learning trajectories [LT]2. Marsico Institute, Morgridge College of Education, University of Denver. https://www.learningtrajectories.org/

Common Core Standards Writing Team. (2019). Progressions for the Common Core State Standards for Mathematics. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.

Richardson, K. (2012). How Children Learn Number Concepts: A Guide to Critical Learning Phases. Bellingham: Math Perspectives Teacher Development Center.

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2018). *Elementary and Middle School Mathematics: Teaching Developmentally.* (10th edition) New York: Pearson (2019:9780134802084)

VDOE Curriculum Framework for All Grades - Standard of Learning Curriculum Framework (SOL)