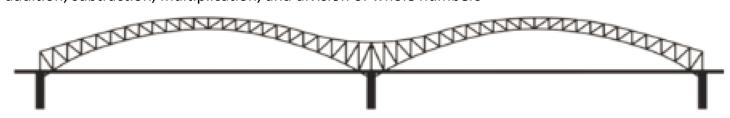


Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Standard of Learning (SOL) 5.4 Create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers



Student Strengths	Bridging Concepts	Standard of Learning
Students can solve a variety of computation problems with a chosen strategy, determine if a total is known or unknown, and restate a single-step	Students can solve a variety of single step problems with an efficient strategy.	Students can create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division
word problem in their own words.	Students can make connections between various computation strategies and determine how they are similar/different.	of whole numbers.

Understanding the Learning Trajectory

Big Ideas:

- By reasoning repeatedly about the connection between math drawings and written numerical work, students can come to see multiplication and division algorithms as abbreviations or summaries of their reasoning (Common Core Writing Team, 2019, p. 14)
- The relationship between inverse operations allows students to make decisions about which operations to use to solve problems. Understanding those relationships will support students' reasoning about problem solving.
- The context of a problem determines the meaning of a remainder and how the remainder affects the solution to the problem.
- In mathematics, emphasis should be placed on representing the problem and applying reasoning to understand it rather than relying on keywords (See Grade 4 VDOE Standards of Learning Document p.19).
- In mathematics, estimation should be used to determine if an answer is reasonable.
- When solving problems, using unit labels with drawings, symbols, numbers will support students' decision making and reasoning about appropriate solutions.

Formative Assessment:

Just in Time Mathematics Quick Check 5.4 PDF

Virginia Department of Education

August 2021

Just in Time Mathematics Quick Check 5.4 Desmos

Important Assessment Look Fors:

- The student determines an appropriate operation to use in a single-step word problem.
- The student uses pictures, numbers, or words to represent and explain the process to solve the problem.
- The student determines the operations of a multi-step word problem and chooses an appropriate plan of action to solve.
- The student labels the units throughout the problem and in the answer to determine reasonableness (in division problems with and without remainders).

Purposeful Questions:

- What are the units? What is being counted in the problem?
- Is the total known or unknown?
- What is happening in the problem? What does that tell you about which operation(s) you will need to use?
- What do the groups represent? How many are in each group?
- How do you know your answer is reasonable and what does your answer mean?

Bridging Activity to Support Standard	Instructional Tips
Routines Would you rather?	In the Would You Rather routine, emphasize reasoning, rather than key words, and making sense of the context of the problem. A key-word focus prepares students to solve a limited set of problems and often leads to incorrect solutions.
	Create your own WYR slides that build in level of difficulty and relate to your number talks. Use real-world and relatable contexts based on content, local/school happenings, etc. Additional Would You Rather slides
Rich Tasks Bakery Problem Bakery Problem Part II -Division	This is a multi-step problem involving addition, subtraction, multiplication, and division. You can manipulate the numbers in this problem based on the students' level of understanding. You may make the numbers larger and use this task as a post-assessment. Have manipulatives available, but support students in drawing a pictorial representation of their work with the manipulatives. In Part II of the problem, students determine how many whole boxes of each item can be sold and how many leftovers there are. This task is meant to help students consider the meaning of the quotient and the remainder. It is a similar bakery problem that can be solved with multiple operations, however it lends itself more to division. Students may struggle with units in both tasks, forgetting what each number represents. Help them label their drawings and numerical representations with appropriate units to help check their strategy. For example, "What does the number represent in your equation here?" or "How does your drawing represent the equation you wrote?" Help students relate their different solutions to the various models/strategies for problem solving. Help them analyze and connect each other's strategies and determine which strategies are most efficient. Use this to leverage them to try a new strategy.
Games	The game Close to 5,000 provides practice in multiplication (multiplying factors),

Close to 5,000

addition (adding products), and subtraction (finding difference between the total and 5,000). Students manipulate 4 numerals to create 2 two-digit numbers that they estimate and then multiply. After 4 rounds the person closest to a sum of 5,000 is the winner. Students can be encouraged to draw arrays to multiply the two-digit numbers throughout the game. In this game estimation is a key factor because the game total is over 4 rounds. Game tip: each round try and get a product between 1,000 and 1,300.

Division Dash

Adapted from Everyday Math

In Division Dash, students practice dividing 2 digit numbers by 1 digit numbers. The object of the game is to reach 100 by adding quotients in the fewest possible divisions. Students use number sense and estimation to make division problems with the largest possible quotients in order to reach 100 in as few turns as possible. Students may play against each other (the first to reach 100 wins) or play against themselves and try to reach 100 with fewer divisions each time they play.

Other Resources:

- <u>Various Division Models</u> Read about different types of problems and models of division. Introduce students to the various types of problems in order to experience different models of division.
- Raise the Bar on Problem Solving Read about how to use a bar model to help students make sense of
 addition/multiplication. Model and solve word problems using interactive tape diagrams. Great for students that
 need a visual component.
- Addition Word Problems Using Thinking Blocks Interactive bar models.
- <u>Multiplication Word Problems Using Thinking Blocks</u>- Interactive bar models.
- <u>Area Model of Multiplication Introduction</u> to 12 x 12 and <u>Area Model representations</u> to 20 x 20. Use these visuals to help students visual the distributive property of multiplication as it relates to the area model.
- VDOE Mathematics Instructional Plans (MIPS)
 - o <u>5.4 Take a Trip: Computation and Estimation with Whole Numbers (Word) / PDF Version</u>
- VDOE Co-Teaching Mathematics Instruction Plans (MIPS)
 - o <u>5.4 Multi-Step Practical Problems</u> (Word) / <u>PDF Version</u>
- VDOE Word Wall Cards: Grade 5 (Word) | (PDF)
 - Addition
 - Subtraction
 - Multiply: ProductDivide: Quotient

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.

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

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 - <u>Standard of Learning Curriculum Framework (SOL)</u>