Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Standard of Learning (SOL) 4.5b Add and subtract fractions and mixed numbers having like and unlike denominators

Student Strengths	Bridging Concepts	Standard of Learning
Students can solve practical problems that involve addition and subtraction with proper fractions having like denominators of 12 or less.	Students can represent equivalent forms of fractions greater than 1.	Students can add and subtract fractions and mixed numbers having like and unlike denominators.

Understanding the Learning Trajectory

Big Ideas:

- Some real-world problems involving joining, separating, part-part-whole, or comparison can be solved using addition; others can be solved using subtraction.
- The effects of operations for addition and subtraction with fractions and decimals are the same as those with whole numbers (Charles, 2005).
- Estimation keeps the focus on the meaning of the numbers and operations, encourages reflective thinking, and helps build informal number sense with fractions. Students can reason with benchmarks to get an estimate without using an algorithm (VDOE Curriculum Framework).
- A variety of strategies can be utilized to add and subtract fractions including area models, linear models, decomposing fractions, and finding a common denominator.

Formative Assessment:

- Just in Time Mathematics Quick Check 4.5b PDF
- Just in Time Mathematics Quick Check 4.5b Desmos

Important Assessment Look Fors:

- The student recognizes and uses equivalent relationships to add and subtract fractions.
- The student uses benchmark fractions to determine reasonable estimates.
- The student names fractions greater than 1 in multiple ways.
- The student adds and subtracts with or without models.

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Purposeful Questions:

- How do you know your answer is reasonable?
- How did that benchmark help you?
- What is an equivalent name for that fraction?
- What relationships do you notice? How can those relationships help you?

Bridging Activity to Support Standard	Instructional Tips
Routines: Fraction Splat, from Steve Wyborney	Fraction splat is an interactive powerpoint presentation that focuses on fraction number sense, part-part-whole, and using a variety of strategies to compose and/or decompose fractions. More information about the Fraction Splat series can be found here: Fraction Splat. Select the slide that best meets the needs of your students. Use Presentation mode to see all animations and versions of the slide in the proper progression. Potential questions to highlight the big ideas: ● ___ used addition to find the missing number. ___ used subtraction. How are addition and subtraction related in this splat? ● What equations matched your thinking? ● Where do you see the __(number) in __'s strategy? ● Why did you get to the next whole? How did that help you? ● What equivalent relationships do you see?
Rich Tasks: Pizza Task Region 1	Consider slowly revealing the information to help students make sense of the task. For example, after revealing the information about Ben's pizza, ask "What would Ben's pizza look like?" Encourage students to represent what's happening in the problem using any strategy that works best for them.
Games/Tech: Greater or Less than 1 FCPS Add Up and Take Down Desmos 4.5b The Fraction Challenge Desmos 4.5b Fractions: Estimating Sums and Differences	For Greater or Less than 1, make a copy of the slides. On slide 3, to reveal the game cards, pull down the cover of the deck of cards to the left of the game mat.Encourage students to record and share their thoughts. If students solve procedurally, encourage them to use benchmarks and number sense to estimate sums and differences. The Add Up and Take Down game requires students to build up/take down a fraction kit using addition and subtraction.This resources is from the 4th grade curriculum at http://www.sfusdmath.org/ In the Desmos Fraction Challenge activity, students will practice adding and subtracting fractions. They will create expressions to match given criteria (e.g., the greatest value, the least positive value, etc.). Students will reason abstractly and structurally, arguing that their expressions are the greatest or least possible. In Desmos Estimating activity, students estimate sums and differences closest to 0,1/2, and 1. The first sort has common denominators and promotes an understanding of decomposing fractions. The second sort has unlike denominators and encourages students to use benchmarks to estimate the sum or difference.

Desmos 4.5b Adding and Subtracting Fractions	In this Desmos Adding and Subtracting activity students use a visual tool for adding and subtracting fractions with like and unlike denominators

Other Resources:

- Color 10 Fractions Game
- VDOE Mathematics Instructional Plans (MIPS)
  - 4.5b – Four in a Row: Fraction Addition and Subtraction (Word)/PDF Version
  - 4.5b – Fraction Strips: What is the Meaning of Addition? (Word)/PDF Version
  - 4.5b – Fraction Riddle: Adding and Subtracting Fractions (Word)/PDF Version
  - 4.5b – Fraction Strips to Number Sentences: Adding Fractions (Word)/PDF Version
  - 4.5b – Fraction Strips: Subtracting Fractions (Word)/PDF Version
  - 4.5b – Which is Closer? Estimating and Finding the Sum of Fractions (Word)/PDF Version
- VDOE Co-Teaching Mathematics Instruction Plans (MIPS)
  - 4.5b- Fraction Strips Addition and Subtraction (Word)/PDF Version
- VDOE Algebra Readiness Remediation Plans
  - Adding and Subtraction Fractions – Using Pattern Blocks (Word)/PDF Version
- VDOE Word Wall Cards: Grade 4 (Word and PDF Version)
  - Fraction: Addition
  - Fraction: Subtraction
  - Least Common Multiple
  - Greatest Common Factor
- Desmos Activities
  - The Fraction Challenge
  - Fractions: Estimating Sums and Differences
  - Adding and Subtracting Fractions

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). Progressions for the Common Core State Standards for Mathematics. 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 - Standard of Learning Curriculum Framework (SOL)