Just In Time Quick Check

Standard of Learning (SOL) 5.6a

Strand: Computation and Estimation

Standard of Learning (SOL) 5.6a

The student will solve single-step and multistep practical problems involving addition and subtraction with fractions and mixed numbers.

Grade Level Skills:

- Solve single-step and multistep practical problems involving addition and subtraction with fractions (proper or improper) having like and unlike denominators and/or mixed numbers. Denominators in the problems should be limited to 12 or less (e.g., $\frac{5}{8}+\frac{1}{4}$, $\frac{5}{6}-\frac{2}{3}$, $3\frac{3}{4}+2\frac{5}{12}$) and answers should be expressed in simplest form.

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Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - 5.6ab – Enough Room: Adding and Subtracting Fractions (Word)/PDF Version
- VDOE Algebra Readiness Remediation Plans
  - Adding and Subtracting Fractions – Using Pattern Blocks (Word)/PDF Version
- VDOE Word Wall Cards: Grade 5 (Word and PDF)
  - Fraction: Addition
  - Fraction: Subtraction
  - Least Common Multiple
  - Greatest Common Factor

Supporting and Prerequisite SOL: 5.4, 4.5a, 4.5b, 4.5c, 3.5

SOL 5.6a - Just in Time Quick Check

1. Throughout the summer, Logan cuts grass for his dad and his neighbor. It takes him $\frac{2}{3}$ of an hour to cut his dad's grass and $\frac{5}{6}$ of an hour to cut his neighbor's grass. What fraction of hours does it take him to cut both yards? Write your answer in simplest form.

2. In Science class, the students were growing plants as part of a scientific experiment. At the end of the experiment, the students measured the height (in inches) of both plants.
   - **a.** Plant *A* grew to a height of $5\frac{1}{4}$ inches.
   - **b.** Plant *B* grew to a height of $3\frac{5}{8}$ inches.

   What is the difference in height, in inches, between Plant *A* and Plant *B*?

3. Emily ran $1\frac{2}{5}$ miles on Tuesday and $1\frac{3}{4}$ miles on Thursday. How many total miles did Emily run during these two days?

4. When planning for a dinner party, my mom purchased 3 pies of the same size for dessert. We ate $\frac{5}{6}$ of one pie and $\frac{7}{8}$ of another pie. How much pie was left over after the party?

5. Carter wanted to make a birdhouse with his dad. Carter's dad had one piece of wood to use for the project that measured $5\frac{1}{4}$ feet long. He first cut off a piece of wood that measured $2\frac{1}{2}$ feet long and then he cut another piece of wood that measured $1\frac{7}{8}$ feet long. How much wood did Carter's dad have left over?

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Common Errors/Misconceptions and Possible Indications

1. Throughout the summer, Logan cuts grass for his dad and his neighbor. It takes him $\frac{2}{3}$ of an hour to cut his dad's grass and $\frac{5}{6}$ of an hour to cut his neighbor's grass. What fraction of hours does it take him to cut both yards? Write your answer in simplest form.

   Some students may compare the amount of time spent cutting each yard and find the difference, instead of finding the total number of hours.

   Another common error occurs when students do not find common multiples to create equivalent fractions with like denominators. Some students add the numerators and denominators together resulting in the fraction $\frac{7}{9}$. These students will need additional support with concrete models and estimation of benchmark fractions to check for the reasonableness of their answer. When using benchmark fractions to estimate the sum, the fractions $\frac{2}{3}$ and $\frac{5}{6}$ are both more than half; therefore, the sum of the two fractions is more than a whole.

   Representing the fraction in simplest form can be difficult for some students. Students may need additional support identifying the greatest common factor and applying this concept to simplifying fractions. To help students reach higher levels of understanding, students should use a variety of representations, employ multiple approaches, and be encouraged to explain and justify their answers.

2. In Science class, the students were growing plants as part of a scientific experiment. At the end of the experiment, the students measured the height (in inches) of both plants.

   a. Plant *A* grew to a height of $5\frac{1}{4}$ inches.

   b. Plant *B* grew to a height of $3\frac{5}{8}$ inches.

   What is the difference in height, in inches, between Plant *A* and Plant *B*?

   A common error results when students find a common denominator but then subtract the numerator from the first fraction from the numerator from the second fraction rather than regrouping to subtract. If students have this misconception, their answer is $2\frac{3}{8}$. Another common misconception is revealed when students attempt to regroup when subtracting fractions. When regrouping some students will take a whole, divide it into 10 equal pieces adding $\frac{10}{10}$ to the fraction, resulting in a number sentence of $4\frac{12}{8}$- $3\frac{5}{8}$. This is common because students are trying to connect the idea of regrouping with whole numbers when regrouping with fractions, ignoring how many pieces equal the whole.

   Students should focus on estimation and benchmarks when solving problems. Using estimation not only encourages number sense but also supports the reasonableness of their answer. Students should explore a variety of strategies when working on problems that require regrouping. Drawing models, using manipulatives, using a number line to add or subtract, and decomposing fractions are just a few strategies that students should explore when subtracting fractions.

3. Emily ran $1\frac{2}{5}$ miles on Tuesday and $1\frac{3}{4}$ miles on Thursday. How many total miles did Emily run during these two days?

   A common misconception when adding fractions with unlike denominators is to add the numerators and denominators together. If a student is unable to find a common denominator, this student will need additional

support connecting the concept of finding common multiples to creating equivalent fractions with like denominators. Refer to the Grade 5 Curriculum Framework for a variety of models to use when representing fractions. This problem also lends itself nicely to the concept of decimals, which is a strategy that students could use to determine the total number of miles.

Another common misconception is revealed when expressing the factions in simplest form. The sum of the two fractions is an improper fraction. Understanding how to convert this fraction to a mixed number can be difficult for some students. Using models and/or pictorial representations will support those students who are unable to convert an improper fraction into its simplest form as a mixed number.

4. When planning for a dinner party, my mom purchased 3 pies of the same size for dessert. We ate $\frac{5}{6}$ of one pie and $\frac{7}{8}$ of another pie. How much pie was left over after the party?

   If a student has an answer of $1\frac{17}{24}$, this student just determined one answer of a multistep problem; not completing the other steps to determine how much pie is remaining. Using concrete models or pictorial representations can help students see that this fraction represents the amount of pie that was eaten and is just one part of the problem. Discussing strategies to determine the amount of pie of remaining should be discussed with this student.

   Other students may understand that $1\frac{17}{24}$ represents the amount of the pie that was eaten, but are unable to determine the amount of pie remaining. There are several different strategies to determine the fraction of pie remaining; however, some students will attempt to subtract from a whole and not regroup. A common answer could be $2\frac{17}{24}$, just subtracting the two whole numbers disregarding the need to regroup. Other students may attempt to regroup by creating a fraction of $\frac{24}{24}$, but will keep the whole the same ($3\frac{24}{24}$ -$1\frac{17}{24}$). These students will need additional support modeling fractions using a variety of representations. Drawing a pictorial representation, using manipulatives, or other strategies such as adding on to determine the missing part will be important for students to understand regrouping with fractions.

   When determining a student's misconception it is important to look at the strategies used or models that were drawn in order to understand the student's thinking. There are several different strategies that students could use when solving this particular problem. Some may find a common denominator and then subtract from the whole. Other students may find common denominators and add on to determine the missing part to equal 3 wholes ($1\frac{17}{24}$ + ? = 3). Drawing models and subtracting the amount of pie eaten could also be a strategy that a student may use. Some students may not even subtract, but instead notice that each pie was one unit fraction away from a whole. Adding $\frac{1}{6}$ and $\frac{1}{8}$ to the remaining one whole pie to get an answer of $1\frac{7}{24}$. Class conversations about the strategies used to solve this particular problem can aid in helping students make connections and develop a deeper understanding.

5. Carter wanted to make a birdhouse with his dad. Carter's dad had one piece of wood to use for the project that measured $5\frac{1}{4}$ feet long. He first cut off a piece of wood that measured $2\frac{1}{2}$ feet long and then he cut another piece of wood that measured $1\frac{7}{8}$ feet long. How much wood did Carter's dad have left over?

   A common error occurs when students determine a partial answer of a multistep problem and do not complete the other steps to determine how much wood was remaining. Using a variety of models and/or pictorial representations will help students to build a greater understanding of the problem. Focusing on estimation and benchmarks of fractions will also support students when checking for the reasonableness of their answer.

Another common misconception for students is not understanding how to regroup when subtracting fractions. Some students will subtract the numerators, disregarding that they need to regroup. Drawing models, using manipulatives, using a number line to add or subtract, and decomposing fractions are just a few strategies that students should explore when subtracting fractions.

There are several different strategies that students could use when solving this particular problem. Some students may combine the pieces of wood cut and then subtract it from the whole piece of wood. Other students may subtract each piece of wood cut from the whole. Sharing strategies is important when connecting operations and methods of solving practical word problems.