Just In Time Quick Check

Standard of Learning (SOL) 4.5b

Strand: Computation and Estimation

Standard of Learning (SOL) 4.5b

The student will add and subtraction fractions and mixed numbers having like and unlike denominators.

Grade Level Skills:

- Determine a common denominator for fractions, using common multiples. Common denominators should not exceed 60.
- Estimate the sum or difference of two fractions.
- Add and subtract fractions (proper or improper) and/or mixed number having like and unlike denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and simplify the resulting fraction. (Subtraction with fractions will be limited to problems that do not require regrouping).

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- 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

Supporting and Prerequisite SOL: 4.2b, 4.2c, 4.3d, 4.4a, 4.5a, 3.2a, 3.2b, 3.5, 2.4a, 2.4b

SOL 4.5b - Just in Time Quick Check

1. Use estimation to explain if the problems shown below have a sum that is more than one whole or less than one whole. Explain your answer in the space provided.

a) $\frac{5}{8} + \frac{3}{4} =$

b) $\frac{2}{6} + \frac{3}{8} =$

c) $\frac{3}{5} + \frac{3}{12} =$

2. What is the difference between $3\frac{9}{10}$ and $1\frac{3}{4}$?

3. Solve the problem shown below. Write your answer in simplest form.

$$\frac{5}{3} + 1\frac{3}{4}$$

4. The teacher gave the students the following problem.

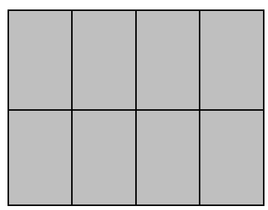
$$2\frac{3}{5} - \frac{6}{12}$$

Both students used estimation strategies to estimate the difference.

a) Xavier said the difference would be a little more than 2 wholes.
b) Ava said that the difference would be less than 2 wholes.

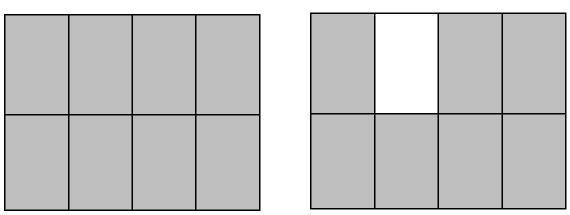
Explain which estimate you most agree with and why?

5. This model is shaded to represent one whole.

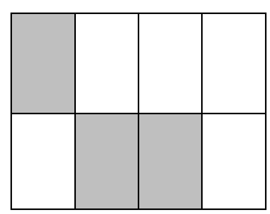


What is the sum of the models shown below? Write your answer in simplest form.

Model 1



Model 2



SOL 4.5b - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Use estimation to explain if the problems shown below have a sum that is more than one whole or less than one whole. Explain your answer in the space provided.

   a) $\frac{5}{8} + \frac{3}{4} =$

   b) $\frac{2}{6} + \frac{3}{8} =$

   c) $\frac{3}{5} + \frac{3}{12} =$

   A common misconception for students is assuming that in order to estimate the sum of a problem you must first solve the problem. Students should use estimation skills such as fraction benchmarks of 0, $\frac{1}{2}$, and 1, prior to solving the problem. Students can use benchmarks to get an estimate without using an algorithm. Estimation encourages reflective thinking and allows students to determine the reasonableness of an answer. Refer to the Grade 4 Curriculum Framework.

   For example with question a, $\frac{5}{8}$ and $\frac{3}{4}$ are both greater than $\frac{1}{2}$, so the sum is greater than 1. If a student did not use estimation strategies and incorrectly tried to solve the problem <u>without finding common denominators</u> the sum would be less than one whole (8/12). Other students may solve the problem procedurally without estimating. If students are unable to estimate fractions using benchmarks, students should explore models to assist them in comparing fractions to common benchmarks. When exploring fractions in relation to benchmarks it is important for students to identify the relationship between the numerator and denominator in order to apply this concept when solving problems. Encouraging students to estimate sums or differences will help them to continue to build fraction number sense.

2. What is the difference between $3\frac{9}{10}$ and $1\frac{3}{4}$?

   A common error for students is incorrectly applying the term "difference." Using word wall cards and other strategies will help students understand and apply mathematics vocabulary.

   Another common error when subtracting fractions with unlike denominators is to subtract the numerators and denominators without finding common denominators. If a student has this misconception then their answer would be $2\frac{6}{6}$ or 3. This student will need additional support using a variety of models, such as fraction circles or fraction strips, to build a greater understanding of subtracting fractions with unlike denominators. This student may also need more instruction in finding least common multiples.

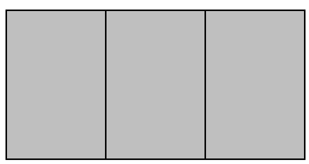
3. Solve the problem shown below.

   $$\frac{5}{3} + 1\frac{3}{4}$$

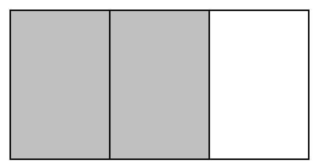
   There are several different strategies that students can use when finding the sum of $\frac{5}{3} + 1\frac{3}{4}$.

One strategy is to convert the improper fraction to a mixed number or another strategy is to convert the mixed number into an improper fraction.

A common error occurs when converting an improper fraction to a mixed number. Some students will just switch the numerator and denominator, changing the value of the fraction. Other students will use procedural strategies such as dividing the denominator by the numerator and using the remainder and original denominator to create a fraction. This process can be confusing to students. Instead, students should understand that an improper fraction is a fraction where the numerator is equal to or greater than the denominator. Drawing a pictorial representation or using concrete models is one strategy to use when converting improper fractions to mixed numbers. Decomposing a fraction is another strategy. When students decompose an improper fraction to a mixed number, the student will focus on creating fractions that are equivalent to a whole and identify the remaining fractional part. For example, $\frac{5}{3}$ is equivalent to $\frac{3}{3}$ and $\frac{2}{3}$ identifying that the improper fraction $\frac{5}{3}$ is equivalent to $1\frac{2}{3}$ written as a mixed number. The model below shows the different strategies of using a pictorial representation and decomposing a fraction when converting an improper fraction to a mixed number.



$\frac{3}{3} = 1$



$\frac{2}{3}$

4. The teacher gave the students the following problem.

$$2\frac{3}{5} - \frac{6}{12}$$

Both students used estimation strategies to estimate the difference.

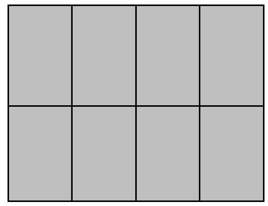
a) Xavier said the difference would be a little more than 2 wholes.
b) Ava said that the difference would be less than 2 wholes.

Explain which estimate you most agree with and why?

Sometimes students have difficulty comparing fractions with an odd denominator to common fraction benchmarks. Understanding that the fraction $\frac{3}{5}$ is more than a half or that the fraction $\frac{1}{3}$ is less than a half is not easy for some students to recognize. Some students will need additional support using fraction circles or number lines to explore this concept. When exploring fractions in relation to benchmarks students should be able to identify, for example, how much greater than a half or even the distance from a whole. It is important for students to understand that the fraction $\frac{3}{5}$ is greater than a half, but also that it is $\frac{1}{10}$ more than a half and $\frac{2}{5}$ from a whole. This understanding of fractions will help students to develop a greater fraction number sense.

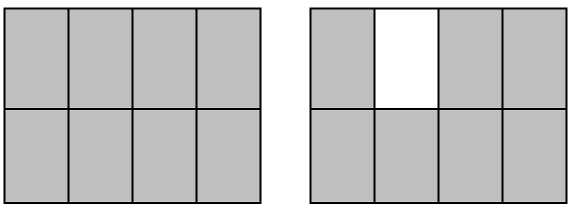
When solving the problem shown above, $2\frac{3}{5}$ is slightly greater than $2\frac{1}{2}$ and the fraction $\frac{6}{12}$ is equivalent to $\frac{1}{2}$ therefore the difference is a little more than 2 wholes. Encouraging students to apply estimation strategies such as benchmarks may lead students to discovering the actual difference and solving this problem without the use of an *algorithm. When students apply what they know about fractions they will discover that the difference is* $2\frac{1}{10}$*. When comparing the estimation to the actual difference, this answer is reasonable because the difference is a little more than 2 wholes.*

5. This model is shaded to represent one whole.

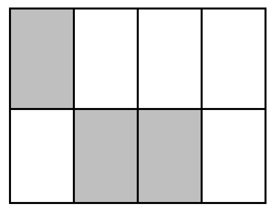


What is the sum of the models shown below? Write your answer in simplest form.

Model 1



Model 2



A common misconception for students when identifying a fraction with a given model is not identifying the whole. When identifying the fraction for model 1, some students may count all parts creating a fraction of $\frac{15}{16}$ *not recognizing that model 1 is more than a whole. Others may correctly identify the fraction* $\frac{8}{8}$ *and* $\frac{7}{8}$*, but instead will add the denominators resulting in the fraction of* $\frac{15}{16}$*. These students will need additional support with concrete models such as fraction circles or fraction strips.*

Some students have difficulty simplifying the resulting fraction. When solving this problem there are several different strategies that students could use resulting in different fractions. Some students may identify the fraction for each figure $(\frac{8}{8}+\frac{7}{8}+\frac{3}{8})$ *getting a sum of* $\frac{18}{8}$*. Other students may identify the fraction for each model* $(1\frac{7}{8}+\frac{3}{8})$ *resulting in the sum of* $1\frac{10}{8}$*. Another strategy is to use the given model by moving* $\frac{1}{8}$ *from model 2 to model 1 creating the number sentence* $2+\frac{2}{8}=2\frac{2}{8}$*. Regardless of the strategies used to solve the problem, students will need to apply the concept of factors by identifying the greatest common factor to simplify the resulting fraction. It is important for students to understand that the fractions are equivalent and are all equal to the fraction* $2\frac{1}{4}$ *in simplest form.*