Just In Time Quick Check

Standard of Learning (SOL) 6.5b

Strand: Computation and Estimation

Standard of Learning (SOL) 6.5b

The student will solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers.

Grade Level Skills:

- Solve single-step and multistep practical problems that involve addition and subtraction with fractions (proper or improper) and mixed numbers, with and without regrouping, that include like and unlike denominators of 12 or less. Answers are expressed in simplest form.
- Solve single-step and multistep practical problems that involve multiplication and division with fractions (proper or improper) and mixed numbers that include denominators of 12 or less. Answers are expressed in simplest form.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - Solve problems involving operations with fractions and mixed numbers (Word) / PDF
- VDOE Algebra Readiness Formative Assessments
  - SOL 6.5b (Word) / PDF
- VDOE Algebra Readiness Remediation Plans
  - Adding and Subtracting Fractions using Pattern Blocks (Word) / PDF
  - Mixed Numbers and Improper Fractions (Word) / PDF
  - Multiplying and Dividing Fractions using Number Lines (Word) / PDF
  - Problem Solving- Strategies for Finding the Hidden Question (Word) / PDF
- VDOE Word Wall Cards: Grade 6 (Word) / PDF
  - Multiplying Fractions with Models
  - Fraction Division with Models
- VDOE Rich Mathematical Tasks
  - 6.5 Cookie Topping Template (Word) / PDF Version
  - 6.5 Cookie Topping Student Version of Task (Word) / PDF Version
  - 6.5 Cookie Topping Anchor Papers (Word) / PDF Version
  - 6.5 Cookie Topping Anchor Papers Scoring Rationales (Word) / PDF Version
- VDOE Instructional Videos for Teachers
  - Area Model for Multiplying Fractions
  - Models for Dividing Fractions
- Desmos Activity
  - Multiplying Fractions with an Area Model

- **Supporting and Prerequisite SOL:** 6.5a, 5.2a, 5.5a, 5.6b, 4.4d, 4.5c

SOL 6.5b - Just in Time Quick Check

1. Melissa has $\frac{4}{5}$ of a bag of dog food. Her dog eats $\frac{1}{10}$ of a bag each day. With the dog food that Melissa has, how many days will she have enough food for her dog?

2. Marcus has $3\frac{1}{6}$ feet of string and he buys a piece that is $2\frac{7}{12}$ feet long. He is making necklaces that each use $1\frac{1}{2}$ feet of string. How many complete necklaces can Marcus make with both pieces of string?

3. In his garden, Juan planted 1200 tomato plants. Two thirds of the plants got plenty of water and survived. How many plants did not survive?

4. Tamika is having 5 friends over for a birthday party. Each serving of ice cream is $\frac{2}{3}$ of a cup. She would like to double that amount for each serving and have enough ice cream for her and her friends. How much ice cream will she need?

5. Mrs. Sanchez is making cupcakes, and each batch makes 3 ½ dozen cupcakes. If she triples the recipe and then splits the total number of cupcakes equally with 7 classes, how many dozen cupcakes does each class get?

SOL 6.5b - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Melissa has $\frac{4}{5}$ of a bag of dog food. Her dog eats $\frac{1}{10}$ of a bag each day. With the dog food that Melissa has, how many days will she have enough food for her dog?

   Students are responsible for single and multiple step questions involving operations with fractions. Isolating the division, which is a new skill, can help the teacher determine student understanding.

   A common mistake that students make is that they multiply to solve this problem. Giving students multiple examples of real-world context may help. Real conversations like, "What is happening with the bag of food. Are you adding pieces together when you feed the dog? Are you taking away food? Are you putting food in multiple times? Are you breaking the food into pieces?" Students can usually determine that it is subtraction or division. Conversations about the relationship between repeated subtraction being the same as division, and repeated addition being the same as multiplication may benefit struggling students.

   Teachers may also wish to encourage students to estimate. If they multiply, they come up with the answer that the dog can be fed $\frac{4}{50}$ of a time. If a student finds that as the answer, ask him/her, "Does it make sense that Melissa can only feed her dog less than one time?" Many times, when students think about real world context, they realize their answer is not reasonable.

2. Marcus has $3\frac{1}{6}$ feet of string and he buys a piece that is $2\frac{7}{12}$ feet long. He is making necklaces that each use $1\frac{1}{2}$ feet of string. How many complete necklaces can Marcus make with both pieces of string?

   When there are multistep word problems, students often have a hard time knowing which operations to use and when to use them. A hands-on activity may help students understand the context of the problem. Breaking students into small groups and giving them $3\frac{1}{6}$ ft. and $2\frac{7}{12}$ ft. (total of $5\frac{9}{12} = 5\frac{3}{4}$ feet) of string is a good activity to reinforce this skill. Students can combine the string and then see how much string they have all together. They can then create "necklaces" that are each $1\frac{1}{2}$ feet long. Cutting string repeatedly into equal parts will reinforce the need to use division or (repeated subtraction). Allowing them to come up with the correct answer with the activity, and then completing the computation will show them if there is a discrepancy. If students combine the string, the final quotient is $3\frac{5}{6}$ necklaces. Some students may round that to 4 necklaces. Students who think about the question holistically and do not think that the string would not be tied together when making necklaces may see that they can make two necklaces from the first piece of string and only one necklace from the second piece of string. Students can be reminded about the word "COMPLETE" so that they understand that the partial section of string cannot count toward a complete necklace. Relating this concept to real life often clears up misconceptions.

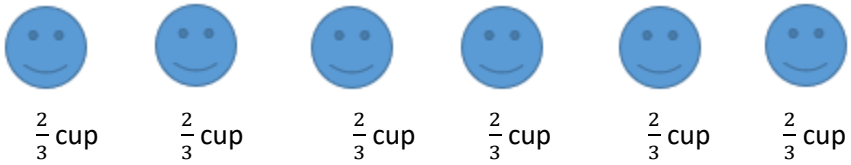
3. In his garden, Juan planted 1200 tomato plants. Two thirds of the plants got plenty of water and survived. How many plants did not survive?

400 plants	400 plants	400 plants
Survive	Survive	Did Not Survive

For this question, some students may divide the 1200 total plants by $\frac{2}{3}$ since it is being broken into parts. This may indicate that students need more experiences with thinking about the concept that "part of a whole" is multiplying a fraction by a whole number. To reinforce the idea of part of whole, have them complete multiple examples of multiplying a whole by a fraction and analyzing the pattern. This will show them when a whole number is multiplied by a proper fraction, the product is smaller than the whole.

Drawing a picture may be beneficial to students, as well. Remind students that the total number of parts is 3, since the denominator is three. Drawing a diagram like the one above may help those who need to see it in a more concrete way. From the picture, students can see that of the three parts, two of the parts survived and the one part did not survive ($\frac{1}{3}$). There are multiple questions that can be answered from this diagram.

4. Tamika is having 5 friends over for a birthday party. Each serving of ice cream is $\frac{2}{3}$ of a cup. She would like to double that amount for each serving and have enough ice cream for her and her friends. How much ice cream will she need?



One common mistake is that students skip over words in the question that are related to operations, such as double, triple, half, etc. It may be helpful to encourage students to draw a picture or model. There are six children, and each gets $\frac{2}{3}$ of a cup of ice cream (see picture above). This may be a good time to have rich conversations about when the doubling should happen. Ask students, "Will you get the same answer if you double the $\frac{2}{3}$ first and then multiply by 6, or double the 6 and then multiply by $\frac{2}{3}$, or multiply 6 by $\frac{2}{3}$, and then double the answer?" Having students share and discuss different strategies also promotes greater understanding.

5. Mrs. Sanchez is making cupcakes, and each batch makes 3 ½ dozen cupcakes. She triples the recipe and then splits the total number of cupcakes equally with 7 classes. How many dozen cupcakes does each class get?

One common mistake when answering this type of question is that students skip over words that describe math action, such as triple. Many students focus on the numbers and would see that the total dozens (of cupcakes) are to be split or divided into 7 parts.

When there are multiple steps to solving a problem, students sometimes lose track of the big picture, and complete only the first step. Highlighting steps, with multiple colors if possible, is a strategy some students may use to ensure they complete each step to answer the question.

Additionally, some students' understanding may be impeded by the word "dozens". A background discussion about where dozen is applied in real life may help. The teacher may also wish to engage students in thinking about how the answer would be different if the question asked for number of cupcakes rather than number of dozens.