End-of-Unit Assessment

Problem 1

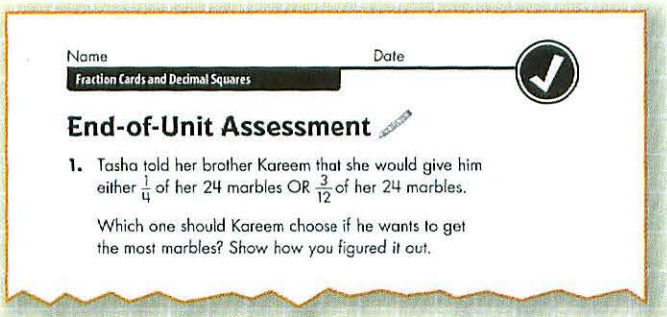
Benchmarks addressed:

Benchmark 2: Identify fractional parts of a group (of objects, people, etc.).

Benchmark 4: Order fractions with like and unlike denominators.

In order to meet the benchmarks, students' work should show that they can:

- Compare these quantities either by finding the fractions of 24 or by reasoning about the equivalence of $\frac{1}{4}$ and $\frac{3}{12}$.



Name Date

Fraction Cards and Decimal Squares

End-of-Unit Assessment

1. Tasha told her brother Kareem that she would give him either $\frac{1}{4}$ of her 24 marbles OR $\frac{3}{12}$ of her 24 marbles.

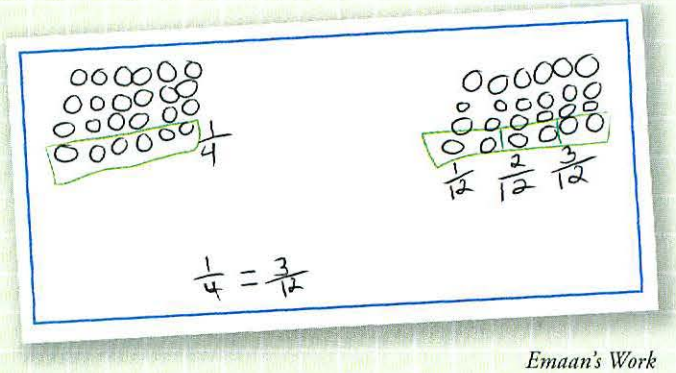
   Which one should Kareem choose if he wants to get the most marbles? Show how you figured it out.

▲ Resource Masters, M31

Meeting the Benchmarks

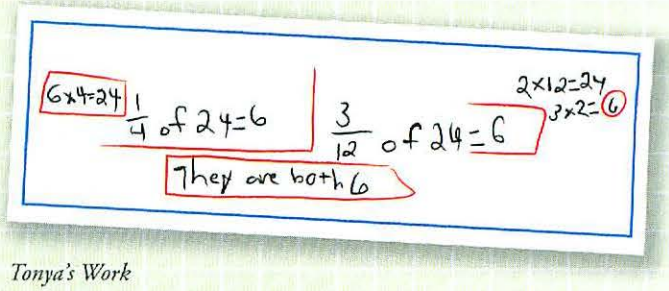
Students who meet the benchmarks can show clearly that $\frac{1}{4}$ of 24 is equal to $\frac{3}{12}$ of 24 using representations or by reasoning about the meaning of the fractions. The following examples demonstrate three different ways students might explain that the two quantities are equal.

Emaan shows two sets of 24 objects. He divides the first set into four equal groups and identifies one of these groups of 6 as $\frac{1}{4}$. On the other set, he identifies $\frac{1}{12}$ of the groups as 2 marbles. He sees that these two quantities are equal and records $\frac{1}{4} = \frac{3}{12}$.



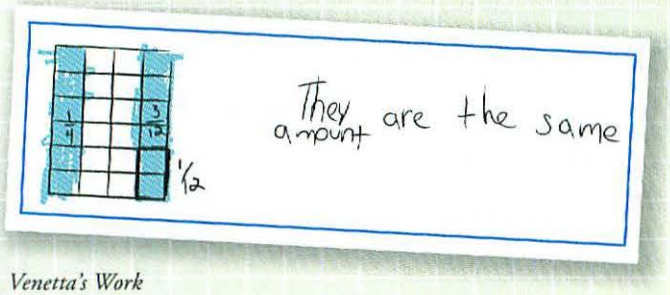
Emaan's Work

Another student, Tonya, uses her knowledge that $6 \times 4 = 24$ to figure out that $\frac{1}{4}$ of 24 is 6. She also knows that 12 groups of 2 equal 24, so three of those groups of 2 is $\frac{3}{12}$ of the marbles.



Tonya's Work

Venetta shows $\frac{1}{4}$ and $\frac{3}{12}$ on the same 4 × 6 rectangle. This is one of the representations used in the unit, and she seems to have chosen wisely because it easily accommodates both fourths and twelfths. She identifies $\frac{1}{12}$ as 2 squares, and three of those are shaded in as $\frac{3}{12}$. It is clear from her drawing that the two fractions are equal.



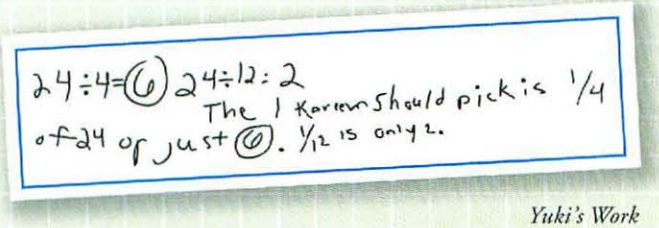
Venetta's Work

Partially Meeting the Benchmarks

Some students may have the correct answer to the problem but may offer no explanation or representation that shows their reasoning. In this case, it is impossible to determine how much they understand about fractions and whether they can extend their understanding to other problems. If a student's answer is limited to "It doesn't matter, they are the same thing," ask questions such as these:

How do you know that they are equal? How can you compare fourths and twelfths? Can you show me $\frac{1}{4}$ and $\frac{3}{12}$? What does the denominator mean? The numerator?

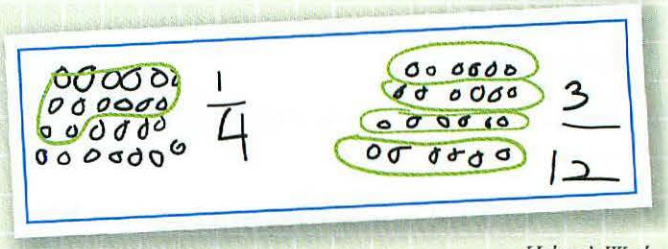
Other students show knowledge about fourths and twelfths but are not able to solve the problem. For example, Yuki demonstrates an understanding of fractions as equal pieces of a whole but compares $\frac{1}{12}$ and $\frac{1}{4}$ of the marbles instead of $\frac{3}{12}$ and $\frac{1}{4}$. Ask questions to find out whether a student like Yuki simply did not keep in mind all parts of the problem or had difficulty with the meaning of fractions with numerators greater than one.



Yuki's Work

Not Meeting the Benchmarks

Students who do not meet the benchmarks show confusion about the meaning of the fractions. Helena, for example, draws representations that show 24 objects, but the pictures do not show fourths or twelfths.

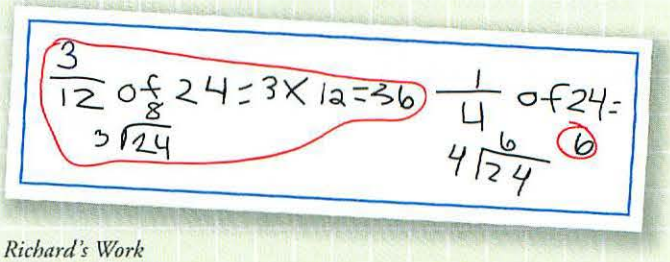


Helena's Work

Helena should be asked to explain her drawing. If necessary, use a context that is more familiar to her. For example:

You have 24 apples to share. If you give me $\frac{1}{4}$ of them, how many will I get? Show me with cubes (or a picture). Show me four equal groups of apples. What if 12 people shared the apples? How many apples would one person get? Let's look at the cubes again.

Richard seems to know that fractions have something to do with equal groups and that multiplying or dividing are operations about equal groups. He does successfully find $\frac{1}{4}$ of 24, but he seems confused as he tries to manipulate the numbers 3, 12, and 24 to find $\frac{3}{12}$ of 24. He seems to treat the numbers 3 and 12 as if they represent separate whole numbers.



Richard's Work

Richard and Helena can both benefit from continuing work on identifying fractions of both rectangles and groups.