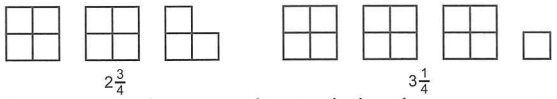
Sample Solutions

2. b) 

3. a) Suppose a red trapezoid is 1 whole. Three green triangles cover the trapezoid. So, each green triangle represents $\frac{1}{3}$. So, $3\frac{2}{3}$ can be shown as 3 trapezoids, or 9 green triangles, plus $\frac{2}{3}$ of a trapezoid, or 2 green triangles, for a total of 11 green triangles, or $\frac{11}{3}$. So, $3\frac{2}{3} = \frac{11}{3}$.

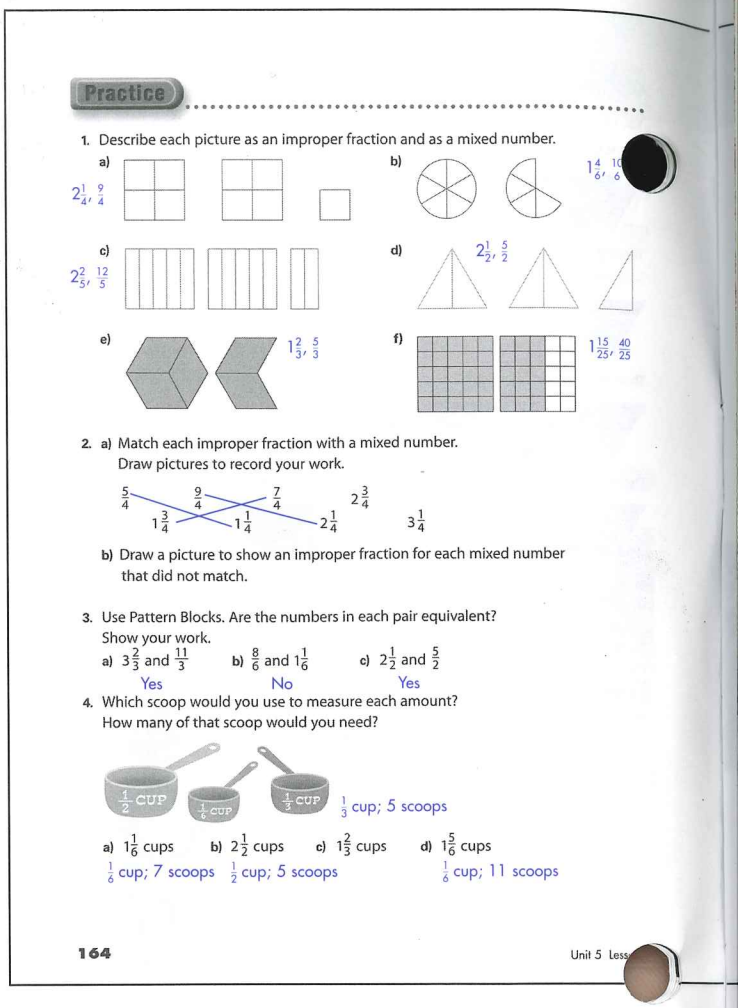
   b) Suppose a yellow hexagon is 1 whole. Six green triangles cover the hexagon. So, each green triangle represents $\frac{1}{6}$. Then, 8 green triangles represent $\frac{8}{6}$. These triangles can be grouped to show that $\frac{8}{6} = 1\frac{2}{6}$. So, $\frac{8}{6}$ and $1\frac{1}{6}$ are not equivalent.

   c) The solution is similar to part a, but with a blue rhombus as 1 whole and 2 green triangles covering the rhombus.

4. a) The fraction part is $\frac{1}{6}$, so I would use the $\frac{1}{6}$-cup scoop. Six $\frac{1}{6}$-cup scoops make up 1 cup, so $1\frac{1}{6}$ cups is:

   6 scoops + 1 scoop = 7 scoops

   The solutions for parts b to d are similar, using the $\frac{1}{2}$-cup scoop, the $\frac{1}{3}$-cup scoop, and the $\frac{1}{6}$-cup scoop, respectively.



Practice

1. Describe each picture as an improper fraction and as a mixed number.
   a) $2\frac{1}{4}, \frac{9}{4}$
   b) $1\frac{4}{6}, \frac{10}{6}$
   c) $2\frac{2}{5}, \frac{12}{5}$
   d) $2\frac{1}{2}, \frac{5}{2}$
   e) $1\frac{2}{3}, \frac{5}{3}$
   f) $1\frac{15}{25}, \frac{40}{25}$

2. a) Match each improper fraction with a mixed number. Draw pictures to record your work.
   $\frac{5}{4}$, $\frac{9}{4}$, $\frac{7}{4}$, $2\frac{3}{4}$, $1\frac{3}{4}$, $1\frac{1}{4}$, $2\frac{1}{4}$, $3\frac{1}{4}$
   b) Draw a picture to show an improper fraction for each mixed number that did not match.

3. Use Pattern Blocks. Are the numbers in each pair equivalent? Show your work.
   a) $3\frac{2}{3}$ and $\frac{11}{3}$ — Yes
   b) $\frac{8}{6}$ and $1\frac{1}{6}$ — No
   c) $2\frac{1}{2}$ and $\frac{5}{2}$ — Yes

4. Which scoop would you use to measure each amount? How many of that scoop would you need?
   $\frac{1}{2}$ CUP, $\frac{1}{6}$ CUP, $\frac{1}{3}$ CUP
   $\frac{1}{3}$ cup; 5 scoops
   a) $1\frac{1}{6}$ cups — $\frac{1}{6}$ cup; 7 scoops
   b) $2\frac{1}{2}$ cups — $\frac{1}{2}$ cup; 5 scoops
   c) $1\frac{2}{3}$ cups
   d) $1\frac{5}{6}$ cups — $\frac{1}{6}$ cup; 11 scoops

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Ask:

- Why do you think $\frac{9}{6}$ is called an improper fraction?
  (We usually think of fractions as being less than 1. We can think of fractions less than 1 as being "proper." The fraction $\frac{9}{6}$ shows an amount greater than 1, so it's "improper.")
- Why do you think $1\frac{3}{6}$ is called a mixed number? *(The number $1\frac{3}{6}$ has a whole number part and a fraction part. So, it is a mix of two different ways of writing numbers.)*

Practice

Question 3 requires Pattern Blocks. Students can record their answers for questions 2 and 3 on triangular grid paper (PM 27) using coloured pencils. Make counters available for question 8. For question 8, ensure students understand that 1 dozen crepes is 12 crepes.

Assessment Focus: Question 7

Students will likely consider the pies separately. Since more than $2\frac{1}{2}$ but less than three 8-piece pies were left, students should determine which fractions with eighths are greater than $2\frac{1}{2}$, but less than 3. They should do the same thing with the 6-piece pies.

Students who need extra support to complete the Assessment Focus questions may benefit from the Step-by-Step masters (Masters 5.15 to 5.21).

5. The Fernandez family drank $3\frac{1}{2}$ pitchers of water on a picnic. Draw pictures to show the amount, then write this mixed number as an improper fraction. Show your work. $\frac{7}{2}$

6. Kendra mowed her lawn for $2\frac{1}{2}$ h.
Mario mowed his lawn for $\frac{1}{4}$ h, then stopped. He did this 7 times.
Who spent more time mowing the lawn? Kendra
How do you know?

7. Carlo baked pies for a party. He cut some pies into 6 pieces and some into 8 pieces. After the party, more than $2\frac{1}{2}$ but less than 3 pies were left.
How much pie might have been left?
Show how you know. $2\frac{4}{6}$, $2\frac{5}{6}$, $2\frac{5}{8}$, $2\frac{6}{8}$, $2\frac{7}{8}$

8. Renée was making crepes by the dozen. Renée's family ate $2\frac{1}{3}$ dozen crepes.
How many crepes did they eat? Show your work. 28

9. How can you find out if $2\frac{1}{2}$ and $\frac{10}{4}$ name the same amount?
Use words, numbers, and pictures to explain.

Reflect

Can $\frac{5}{6}$ be written as a mixed number?
Use words and pictures to explain.

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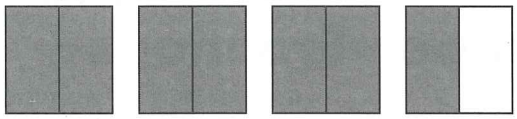
5. Each square represents 1 pitcher of water. Each rectangle in the square represents half of a pitcher of water. The Fernandez family drank $3\frac{1}{2}$ pitchers:



This can also be written as the improper fraction $\frac{7}{2}$.

6. Mario mowed his lawn for $\frac{7}{4}$ h. $\frac{7}{4}$ is the same as $1\frac{3}{4}$, and $2\frac{1}{2} > 1\frac{3}{4}$. So, Kendra spent more time mowing.

7. Find all the mixed numbers that are greater than $2\frac{1}{2}$ but less than 3. The fraction parts must have denominators of 6 or 8. $\frac{1}{2}$ is the same as both $\frac{3}{6}$ and $\frac{4}{8}$. So, $2\frac{4}{6}$, $2\frac{5}{6}$, $2\frac{5}{8}$, $2\frac{6}{8}$, and $2\frac{7}{8}$ are between $2\frac{1}{2}$ and 3.

8. 2 dozen is 24. $\frac{1}{3}$ dozen is 4. $24 + 4 = 28$
Renée's family ate 28 crepes.

9. Change $2\frac{1}{2}$ to $2\frac{2}{4}$. Then change $2\frac{2}{4}$ to an improper fraction:
$2\frac{2}{4} = \frac{8}{4} + \frac{2}{4} = \frac{10}{4}$; the numbers name the same amount.

REFLECT: $\frac{5}{6}$ cannot be written as a mixed number because $\frac{5}{6}$ is less than 1 and mixed numbers are greater than 1.

ASSESSMENT FOR LEARNING

What to Look For

Conceptual Understanding

✔ Students explain that an improper fraction represents more than one whole, and that its numerator is greater than its denominator.

Procedural Knowledge

✔ Students can rename an improper fraction as a mixed number.

✔ Students can rename a mixed number as an improper fraction.

What to Do If You Don't See It

Adjust Instruction

Provide students with small pieces of paper folded into equal parts, such as fourths. Have them colour the parts to show an improper fraction, such as $\frac{7}{4}$. Then ask students to record how many wholes there are and how many fourths are left over.

Have students work in pairs. One student models an improper fraction with Pattern Blocks. The other student arranges the blocks into wholes and fractions and then names the mixed number.