Summarize the strategies for finding equivalent fractions that students bring out and make them explicit.

ACE

Assignment Guide for Problem 1.3

Applications: 5–18
Connections: 44–46, 52–53, 55–64, 71–80

Answers to Problem 1.3

A. **1.** Check students' strips.

2. Answers will vary. Possible answers: For **thirds:** Make an S with a strip and press it together, keeping all three pieces the same length. For **thirds:** Fold a strip around itself until all three parts are equal length and then press it together, keeping all three sections of equal length. For **sixths:** Fold thirds, then fold in half. For **fifths:** Fold a strip around two fingers two-and-a-half times. Take the strip off your fingers—still rolled—and flatten the roll, making the five sections as close as possible to the same length.

B. **1.** Fold halves in half, then in half again.

2. One part of a halves strip is four times the size of one part of an eighths strip.

3. You can fold a thirds strip in half to make **sixths**. You can fold a thirds strip in thirds to make **ninths**. You can fold a thirds strip in fourths to make **twelfths**, etc.

4. Halves, thirds, fourths, sixths, eighths, ninths and tenths. The fifths strip may have marks that are close to marks on the twelfths strip, but these marks will not line up exactly (unless the folds are inaccurate). This suggests $\frac{1}{2}=\frac{6}{12}$, $\frac{1}{3}=\frac{4}{12}$, $\frac{1}{4}=\frac{3}{12}$, $\frac{1}{6}=\frac{2}{12}$, $\frac{3}{9}=\frac{4}{12}$, $\frac{5}{10}=\frac{6}{12}$, etc.

C. **1.** **a.** $\frac{4}{6}$, $\frac{6}{9}$, and $\frac{9}{12}$

b. Additional fractions will vary, but include $\frac{10}{15}$, $\frac{12}{18}$, and $\frac{14}{21}$.

2. Answers will vary. Possible answers: If you double (or triple, or...) both the numerator and denominator, you get a fraction equivalent to the one you started with. If you add the numerator to itself and the denominator to itself, you get a fraction equivalent to the one you started with.

D. **1.** **a.** The distance between 0 and $\frac{7}{10}$ is $\frac{7}{10}$.

b. The distance between $\frac{3}{5}$ and $\frac{7}{10}$ is $\frac{1}{10}$.

c. The distance between $\frac{7}{10}$ and 1 is $\frac{3}{10}$.

d. The distance between $\frac{3}{5}$ and 1 is $\frac{2}{5}$.

2. **a.** The distance between 0 and $\frac{1}{3}$ is $\frac{1}{3}$.

b. The distance between $\frac{1}{3}$ and $\frac{1}{2}$ is $\frac{1}{6}$.

c. The distance between $\frac{1}{3}$ and $\frac{2}{3}$ is $\frac{1}{3}$.

d. The distance between $\frac{1}{2}$ and $\frac{2}{3}$ is $\frac{1}{6}$.

e. The distance between $\frac{1}{2}$ and 1 is $\frac{1}{2}$.

f. The distance between $\frac{2}{3}$ and 1 is $\frac{1}{3}$.

E. **1.** Answers will vary. Possible answers: $\frac{4}{12}=\frac{1}{3}=\frac{2}{6}=\frac{3}{9}=\frac{5}{15}=\frac{6}{18}$

2. Answers will vary. Possible answers: $\frac{1}{4}$, $\frac{2}{5}$, $\frac{3}{8}$, $\frac{3}{10}$, $\frac{4}{10}$, $\frac{3}{12}$ and $\frac{5}{12}$

3. Answers will vary. Possible answers: With fraction strips, you line up the ends and look for the marks that match up exactly. With number lines, you can cut lengths into smaller pieces (such as cutting each fourth into two pieces to get eighths). With numbers, you can multiply (or divide) the numerator and denominator by the same number to get equivalent fractions.

4. He is correct. You can fold a strip in thirds and then use this to mark the number line from 0 to 1. This locates the point $\frac{1}{3}$ on the line. You can also use the fraction strip to measure a distance from $\frac{2}{3}$ to 1, or from $\frac{1}{2}$ to $\frac{5}{6}$. In both these cases the distance is $\frac{1}{3}$.

5. This is a good idea. You would have to make sure that the whole strip matched the whole thermometer. Then you could fold the fraction strip in a way such that one piece matched the shaded portion of the thermometer, or some multiple of folded pieces matched the shaded portion.