Fractions as Multiples of Unit Fractions

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

The numerator counts unit fractions: $\frac{5}{8} = 5 \times \frac{1}{8}$. The unit is $\frac{1}{8}$, not $\frac{1}{5}$. This expresses one fraction as a multiple of its own unit fraction.

Worked example

Express $\frac{9}{10}$ as a whole number times a unit fraction.

1. One equal part is $\frac{1}{10}$.
2. The amount contains 9 of these parts, so use multiplier 9.
3. Check: $9 \times \frac{1}{10} = \frac{9}{10}$.
Answer: $\frac{9}{10} = 9 \times \frac{1}{10}$.

Practice Problems

Show your thinking.

1. A $\frac{7}{8}$-m border uses unit pieces of $\frac{1}{8}$ m. Write the length as a product.

2. A $\frac{4}{5}$-L measure is built from fifth-liters. Name the multiplier and unit.

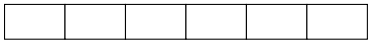
3. A $1\frac{1}{10}$-m strip uses tenth-meter pieces. Express its length as a unit-fraction multiple.

4. A design covers $\frac{5}{12}$ of a panel. Express that as a multiple of one equal part.

5. A $\frac{6}{10}$-m design calls for six quarter-meter pieces. Repair the piece size.

6. Design one whole using only eighth-sized units. Give the multiplier and product.

7. Shade five sixths of the blank bar. Label the unit size and write the multiplier.



8. Explain why a $\frac{3}{4}$-m strip may be made from 3 quarter-meter units or 6 eighth-meter units.

Answer Key

1. $\frac{7}{8}$ m $= 7 \times (\frac{1}{8}$ m$)$.
2. Multiplier 4; unit $\frac{1}{5}$ L, giving $\frac{4}{5}$ L.
3. $\frac{11}{10}$ m $= 11 \times (\frac{1}{10}$ m$)$.
4. $\frac{5}{12} = 5 \times \frac{1}{12}$.
5. Use six $\frac{1}{10}$-m pieces.
6. 8 units; $8 \times \frac{1}{8} = 1$.
7. Unit $\frac{1}{6}$; multiplier 5.
8. $3 \times \frac{1}{4} = 6 \times \frac{1}{8} = \frac{3}{4}$ m.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. One equal part is $\frac{1}{8}$ m.
2. The amount contains 7 of these parts, so use multiplier 7.
3. Check: $7 \times (\frac{1}{8}$ m$) = \frac{7}{8}$ m.

Problem 2

1. One equal part is $\frac{1}{5}$ L.
2. The amount contains 4 of these parts, so use multiplier 4.
3. Check: $4 \times (\frac{1}{5}$ L$) = \frac{4}{5}$ L.

Problem 3

1. One equal part is $\frac{1}{10}$ m.
2. The amount contains 11 of these parts, so use multiplier 11.
3. Check: $11 \times (\frac{1}{10}$ m$) = \frac{11}{10}$ m.

Problem 4

1. One equal part is $\frac{1}{12}$.
2. The amount contains 5 of these parts, so use multiplier 5.
3. Check: $5 \times \frac{1}{12} = \frac{5}{12}$.

Problem 5

1. The target denominator 10 specifies tenth-meter pieces.
2. $6 \times \frac{1}{10} = \frac{6}{10}$ m.
3. Six quarters would total $\frac{6}{4} = 1\frac{1}{2}$ m, too long.

Problem 6

1. One whole is $\frac{8}{8}$.
2. The numerator gives 8 unit pieces.
3. $8 \times \frac{1}{8} = \frac{8}{8} = 1$ checks the design.

Problem 7

1. The bar contains 6 equal pieces, so each is $\frac{1}{6}$.
2. Shade 5 pieces to show $\frac{5}{6}$.
3. $5 \times \frac{1}{6} = \frac{5}{6}$ is the matching product.

Problem 8

1. Each quarter equals 2 eighths.
2. Three quarters use $3 \times 2 = 6$ eighths.
3. $\frac{6}{8} = \frac{3}{4}$ m verifies both unit choices.

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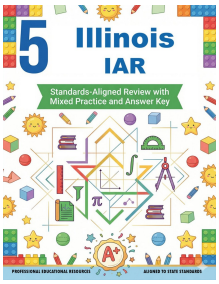

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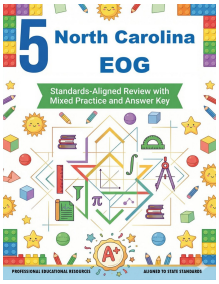

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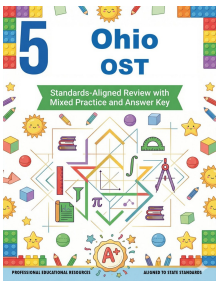

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