Multiplying Fractions by Whole Numbers

Explore ideas and representations

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

QUICK REVIEW

A whole number times a fraction means equal groups: $3 \times \frac{2}{5} = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5} = 1\frac{1}{5}$. Multiply the numerator by the group count; do not multiply the denominator.

Worked example

Find $4 \times \frac{3}{8}$ using equal groups.

1. 4 equal groups give $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8}$.

2. The numerator count is $4 \times 3 = 12$, so the product is $\frac{12}{8}$.

3. $\frac{12}{8} = 1\frac{1}{2}$; dividing the total by 4 gives $\frac{3}{8}$ per group.

Answer: $1\frac{1}{2}$.

Practice Problems

Show your thinking.

1. Find $3 \times \frac{2}{7}$.

2. Calculate $4 \times \frac{3}{10}$.

3. Write $5 \times \frac{3}{8}$ as repeated addition, then find its value.

4. Show two groups of $\frac{5}{6}$ using the bars. Each bar is one whole. Find the product.



5. Fix: $4 \times \frac{2}{5} = \frac{8}{20}$.

6. How many groups of $\frac{3}{8}$ make $\frac{9}{8}$?

7. Is $2 \times \frac{5}{8}$ more or less than one? Show the exact amount.

8. A maker joins three $\frac{4}{9}$-m pieces. Find the full length.

Answer Key

1. $\frac{6}{7}$.
2. $1\frac{1}{5}$.
3. $\frac{3}{8}+\frac{3}{8}+\frac{3}{8}+\frac{3}{8}+\frac{3}{8}=1\frac{7}{8}$.
4. $1\frac{2}{3}$.
5. $\frac{8}{5}=1\frac{3}{5}$.
6. 3.
7. $1\frac{1}{4}$, more than one.
8. $1\frac{1}{3}$ m.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. 3 equal groups give $\frac{2}{7}+\frac{2}{7}+\frac{2}{7}$.
2. The numerator count is $3\times 2=6$, so the product is $\frac{6}{7}$.
3. $\frac{6}{7}=\frac{6}{7}$; dividing the total by 3 gives $\frac{2}{7}$ per group.

Problem 2

1. 4 equal groups give $\frac{3}{10}+\frac{3}{10}+\frac{3}{10}+\frac{3}{10}$.
2. The numerator count is $4\times 3=12$, so the product is $\frac{12}{10}$.
3. $\frac{12}{10}=1\frac{1}{5}$; dividing the total by 4 gives $\frac{3}{10}$ per group.

Problem 3

1. 5 equal groups give $\frac{3}{8}+\frac{3}{8}+\frac{3}{8}+\frac{3}{8}+\frac{3}{8}$.
2. The numerator count is $5\times 3=15$, so the product is $\frac{15}{8}$.
3. $\frac{15}{8}=1\frac{7}{8}$; dividing the total by 5 gives $\frac{3}{8}$ per group.

Problem 4

1. 2 equal groups give $\frac{5}{6}+\frac{5}{6}$.
2. Mark 5 cells for the first group. For the second group, use the last cell of the first bar and 4 cells of the next bar.
3. The numerator count is $2\times 5=10$, so the product is $\frac{10}{6}$.
4. $\frac{10}{6}=1\frac{2}{3}$; dividing the total by 2 gives $\frac{5}{6}$ per group.

Problem 5

1. There are 4 groups of 2 fifths, so $4\times 2=8$ fifths.
2. The piece size stays $\frac{1}{5}$, giving $\frac{8}{5}$.
3. $\frac{8}{5}=1\frac{3}{5}$; $\frac{8}{20}$ would wrongly shrink the parts.

Problem 6

1. The target contains 9 eighths; each group contains 3.
2. $9\div 3=3$ groups.
3. $3\times\frac{3}{8}=\frac{9}{8}$ checks the count.

Problem 7

1. $2\times 5=10$ eighths.
2. $\frac{10}{8}=\frac{8}{8}+\frac{2}{8}=1\frac{1}{4}$.
3. The excess above one is $\frac{2}{8}=\frac{1}{4}$.

Problem 8

1. 3 equal groups give $\frac{4}{9}+\frac{4}{9}+\frac{4}{9}$.
2. The numerator count is $3\times 4=12$, so the product is $\frac{12}{9}$.
3. $\frac{12}{9}=1\frac{1}{3}$; dividing the total by 3 gives $\frac{4}{9}$ per group.

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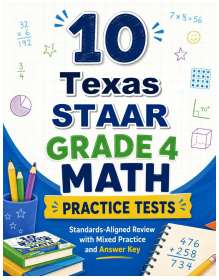

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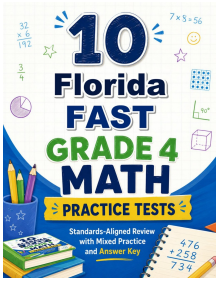

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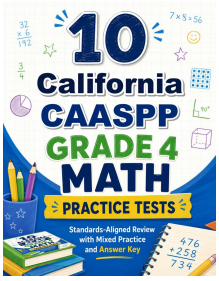

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