Multiplying Fractions by Fractions

Multiplying Fractions by Fractions: Models and Computation

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A fraction of a fraction can be modeled by overlap in a unit rectangle. For $\frac{2}{5}$ of $\frac{1}{3}$, 2 of 15 cells overlap, so $\frac{2}{5} \times \frac{1}{3} = \frac{2}{15}$. Multiply numerators and denominators, then simplify.

Worked example

Calculate $\frac{3}{7} \times \frac{7}{8}$. Show the place-value or fraction calculation.

1. Multiply numerators: $3 \times 7 = 21$.
2. Multiply denominators: $7 \times 8 = 56$.
3. $\frac{3}{7} \times \frac{7}{8} = \frac{21}{56} = \frac{3}{8}$ after simplifying.

Answer: $\frac{3}{8}$.

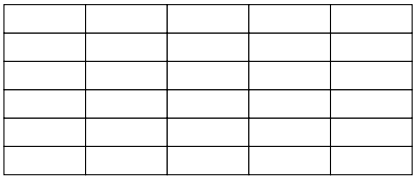
Practice Problems

Show your thinking.

1. Calculate $\frac{2}{3} \times \frac{3}{4}$. Show the place-value or fraction calculation.

2. Model $\frac{3}{5}$ of $\frac{5}{6}$. Mark $\frac{3}{5}$ of the columns and $\frac{5}{6}$ of the rows in two ways. Find the fraction of all cells marked twice.

One whole



3. A full recipe uses $\frac{7}{8}$ kg of flour. A batch is $\frac{2}{3}$ times that recipe. How much flour is needed?

4. Use an inverse operation to verify a proposed result of $\frac{12}{35}$ for $\frac{4}{5} \times \frac{3}{7}$. Show both computations.

5. A student writes $\frac{5}{6} \times \frac{3}{4} = \frac{9}{8}$. Correct the result and check it.

6. Find the missing number: $\frac{3}{8} \times \square = \frac{3}{10}$. Check by substitution.

Answer Key

1. $\frac{1}{2}$.
2. $\frac{1}{2}$.
3. $\frac{7}{12}$ kg.
4. The result $\frac{12}{35}$ is correct.
5. $\frac{5}{8}$, not $\frac{9}{8}$.
6. $\frac{4}{5}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

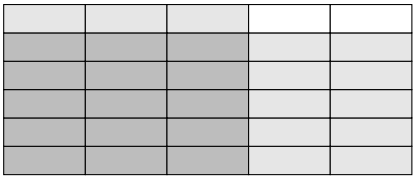
Problem 1

1. Multiply numerators: $2 \times 3 = 6$.
2. Multiply denominators: $3 \times 4 = 12$.
3. $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$ after simplifying.

Problem 2

1. Mark 3 of the 5 columns and 5 of the 6 rows. The dark cells are marked twice.

One whole



2. Overlap: $3 \times 5 = 15$ out of $5 \times 6 = 30$ equal cells.
3. The product is $15/30 = \frac{1}{2}$.

Problem 3

1. The quantities call for $\frac{7}{8} \times \frac{2}{3}$; the result is measured in kg.
2. Multiply numerators: $7 \times 2 = 14$.
3. Multiply denominators: $8 \times 3 = 24$.
4. $\frac{7}{8} \times \frac{2}{3} = \frac{14}{24} = \frac{7}{12}$ after simplifying.

Problem 4

1. Multiply numerators: $4 \times 3 = 12$.
2. Multiply denominators: $5 \times 7 = 35$.
3. $\frac{4}{5} \times \frac{3}{7} = \frac{12}{35} = \frac{12}{35}$ after simplifying.
4. Use like pieces: the product $\frac{12}{35} = \frac{12}{35}$ and the known factor $\frac{3}{7} = \frac{15}{35}$.
5. The product is 12 of the 15 equal pieces in the known factor. The recovered factor is $\frac{12}{15} = \frac{4}{5}$.

Problem 5

1. Multiply numerators: $5 \times 3 = 15$.
2. Multiply denominators: $6 \times 4 = 24$.
3. $\frac{5}{6} \times \frac{3}{4} = \frac{15}{24} = \frac{5}{8}$ after simplifying.
4. The claimed value differs by $\frac{1}{2}$, so it fails the exact calculation.

Problem 6

1. Use like pieces: the product $\frac{3}{10} = \frac{12}{40}$ and the known factor $\frac{3}{8} = \frac{15}{40}$.
2. The product is 12 of the 15 equal pieces in the known factor. The recovered factor is $\frac{12}{15} = \frac{4}{5}$.
3. Check the completed product: $\frac{3}{8} \times \frac{4}{5} = \frac{3}{10}$.

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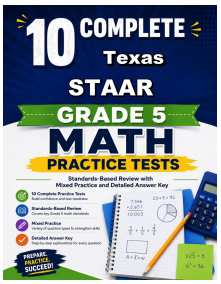

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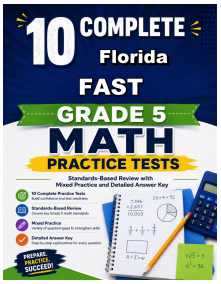

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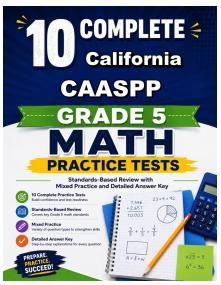

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