Fraction Multiplication Word Problems

Apply the skill to decisions and designs

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

QUICK REVIEW

Multiply the number of groups by the fractional amount in each group. Two $\frac{5}{12}$-m pieces make $2 \times \frac{5}{12} = \frac{10}{12} = \frac{5}{6}$ m. Keep the measurement unit; the group count is not a length. For a plan, check each limit and subtract what is used from the supply.

Worked example

A cook has $4\frac{3}{10}$ cups of broth. Four bowls each need $\frac{7}{10}$ cup. Save $\frac{1}{10}$ cup for tasting. How much is left after both?

1. The bowls use $4 \times \frac{7}{10} = \frac{28}{10}$ cups.
2. Set aside the tasting amount too: $\frac{28}{10} + \frac{1}{10} = \frac{29}{10}$ cups.
3. $4\frac{3}{10} = \frac{43}{10}$, so $\frac{43}{10} - \frac{29}{10} = \frac{14}{10} = 1\frac{2}{5}$ cups remain.
Answer: $1\frac{2}{5}$ cups left.

Practice Problems

Show your thinking.

1. Use the table. A cooler needs at least 2 L and holds at most $2\frac{2}{5}$ L. Which plan works? Give all three volumes.

Plan	Bottles	L each
A	3	$\frac{4}{5}$
B	4	$\frac{2}{5}$
C	5	$\frac{3}{5}$

2. Set aside $\frac{3}{4}$ m from a 4-m cord. Cut as many $\frac{2}{4}$-m ties as possible. Give the count and leftover outside the reserve.

3. Need 2 kg of clay. Small bags: $\frac{3}{8}$ kg for 3 dollars. Large bags: $\frac{5}{8}$ kg for 4 dollars. Buy only one size. Find the cheapest order and extra clay.

4. A 2-L pitcher fills three $\frac{1}{4}$-L cups, then two $\frac{3}{8}$-L cups. Can it fill two more $\frac{3}{8}$-L cups? Give the shortage or spare amount.

5. A plan calls for five $\frac{3}{4}$-m pieces from a $3\frac{1}{4}$-m roll. Change one planned piece to $\frac{1}{4}$ m. Will it fit? Give the new total and leftover.

6. Fill exactly 5 bottles to get $2\frac{3}{4}$ L. Each bottle holds either $\frac{1}{4}$ L or $\frac{3}{4}$ L. How many of each size are needed?

7. A crew starts with 5 kg of seed and uses three $\frac{3}{8}$-kg bags a day. After 3 days, can it cover a fourth day? Give the amount left after day four.

8. Bring enough $\frac{1}{2}$-L bottles to fill four $\frac{3}{8}$-L cups even if one full bottle spills. Find the fewest bottles and the leftover if none spill.

Answer Key

1. A: $2\frac{2}{5}$ L, fits. B: $1\frac{3}{5}$ L, too little. C: 3 L, too much.
2. 6 ties; $\frac{1}{4}$ m left outside the reserve.
3. 4 large bags for 16 dollars, with $\frac{1}{2}$ kg extra.
4. No; $\frac{1}{4}$ L short.
5. Yes; $3\frac{1}{4}$ m used, 0 m left.
6. 2 quarter-liter bottles and 3 three-quarter-liter bottles.
7. Yes; $\frac{1}{2}$ kg left after day four.
8. 4 bottles; $\frac{1}{2}$ L left if none spill.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The allowed volumes run from $\frac{10}{5}$ L through $\frac{12}{5}$ L.
2. Plan A gives $3 \times \frac{4}{5} = \frac{12}{5}$ L, right at the upper limit.
3. Plan B gives $4 \times \frac{2}{5} = \frac{8}{5}$ L, below the lower limit.
4. Plan C gives $5 \times \frac{3}{5} = \frac{15}{5}$ L, above the upper limit. Only A works.

Problem 2

1. After setting aside the reserve, $\frac{16}{4} - \frac{3}{4} = \frac{13}{4}$ m is available.
2. Six ties use $6 \times \frac{2}{4} = \frac{12}{4}$ m. Seven need $\frac{14}{4}$ m, which is too much.
3. $\frac{13}{4} - \frac{12}{4} = \frac{1}{4}$ m remains outside the reserve.

Problem 3

1. The goal is $\frac{16}{8}$ kg. Five small bags give $\frac{15}{8}$ kg, so buy at least six: $\frac{18}{8}$ kg for $6 \times 3 = 18$ dollars.
2. Three large bags give $\frac{15}{8}$ kg, so buy at least four: $\frac{20}{8}$ kg for $4 \times 4 = 16$ dollars.
3. $16 < 18$, so choose four large bags. $\frac{20}{8} - \frac{16}{8} = \frac{1}{2}$ kg is extra.

Problem 4

1. The first round uses $3 \times \frac{1}{4} = \frac{3}{4} = \frac{6}{8}$ L.
2. The second round uses $2 \times \frac{3}{8} = \frac{6}{8}$ L. Both rounds use $\frac{12}{8}$ L.
3. $\frac{16}{8} - \frac{12}{8} = \frac{4}{8}$ L remains, but the next round needs $\frac{6}{8}$ L.
4. $\frac{6}{8} - \frac{4}{8} = \frac{1}{4}$ L is missing.

Problem 5

1. The old plan uses $5 \times \frac{3}{4} = \frac{15}{4}$ m, more than the roll of $\frac{13}{4}$ m.
2. Four long pieces and one short piece use $4 \times \frac{3}{4} + \frac{1}{4} = \frac{13}{4} = 3\frac{1}{4}$ m.
3. $\frac{13}{4} - \frac{13}{4} = 0$ m remains. The revised plan fits exactly.

Problem 6

1. Five small bottles give $\frac{5}{4}$ L. The target is $\frac{11}{4}$ L, so add $\frac{6}{4}$ L.
2. Switching a small bottle to a large one adds $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$ L. $6 \div 2 = 3$ switches are needed.
3. That leaves $5 - 3 = 2$ small bottles. Check: $2 \times \frac{1}{4} + 3 \times \frac{3}{4} = \frac{11}{4} = 2\frac{3}{4}$ L.

Problem 7

1. One day uses $3 \times \frac{3}{8} = \frac{9}{8}$ kg. Three days use $9 \times \frac{3}{8} = \frac{27}{8}$ kg.
2. $\frac{40}{8} - \frac{27}{8} = \frac{13}{8}$ kg remains. This is enough for another $\frac{9}{8}$ kg.
3. After day four, $\frac{13}{8} - \frac{9}{8} = \frac{4}{8} = \frac{1}{2}$ kg remains.

Problem 8

1. The cups need $4 \times \frac{3}{8} = \frac{12}{8} = 1\frac{1}{2}$ L.
2. Three unspilled bottles provide $3 \times \frac{1}{2} = 1\frac{1}{2}$ L. Bring 4 so that 3 remain after a spill; bringing 3 would leave only 1 L after a spill.
3. Without a spill, $4 \times \frac{1}{2} = 2$ L. After filling the cups, $2 - 1\frac{1}{2} = \frac{1}{2}$ L remains.

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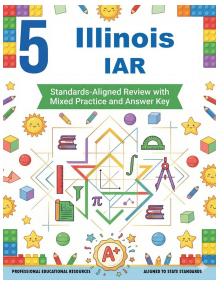

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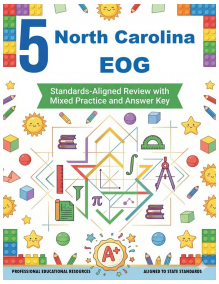

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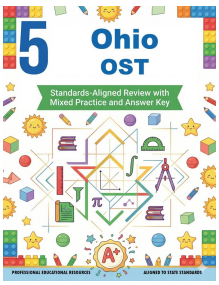

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