

Fraction Split Strategies

Break one fraction into same-denominator parts.

GRADE 4 • NY-4.NF.3.b

NY-4.NF.3.b "Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions."

NAME _____

DATE _____

SPLIT THE NUMERATOR

To decompose a fraction, keep the denominator the same in every addend. Split the numerator into parts that add to the original numerator, then write an equation to show the parts.

WORKED EXAMPLE

Decompose $7/12$ in two different ways.

1. Start with 7 twelfths.
2. Split 7 into 1 and 6.
3. Split 7 another way into 3 and 4.

Answer: $7/12 = 1/12 + 6/12$; $7/12 = 3/12 + 4/12$

PRACTICE 6 problems

- 1** Write $5/6$ as a sum of unit fractions.

ANSWER _____

- 2** Decompose $4/5$ into two fractions with denominator 5. Use $1/5$ as the first addend.

ANSWER _____

- 3** Write two different equations that decompose $3/4$.

ANSWER _____

- 4** Which decomposition equals $5/8$? Circle A, B, or C. Then explain how you know. A. $2/8 + 3/8$ B. $2/8 + 2/8$ C. $1/8 + 3/8$

ANSWER _____

- 5** Write two different equations that decompose $9/10$ into exactly three fractions with denominator 10.

ANSWER _____

- 6** A student says that $2/3 + 2/3 = 4/6$. Is the student correct? Write the correct sum and explain.

ANSWER _____

APPLY IT Show your work

- 1** Jalen practices drums for $\frac{4}{5}$ of an hour total over two days. Write two different equations that show how the practice time could be split between the days.

WORK SPACE

ANSWER _____

- 2** A robotics club completes $\frac{8}{10}$ of a coding project during three work sessions. Write an equation to show one possible amount completed in each session. Then justify your equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

List every way to decompose $\frac{6}{10}$ into exactly two nonzero fractions with denominator 10. Do not count reversed addends as a new way. Explain why your list is complete.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Write $\frac{5}{6}$ as a sum of unit fractions.	$\frac{5}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$
2	Decompose $\frac{4}{5}$ into two fractions with denominator 5. Use $\frac{1}{5}$ as the first addend.	$\frac{4}{5} = \frac{1}{5} + \frac{3}{5}$
3	Write two different equations that decompose $\frac{3}{4}$.	$\frac{3}{4} = \frac{1}{4} + \frac{2}{4}$; $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$
4	Which decomposition equals $\frac{5}{8}$? Circle A, B, or C. Then explain how you know. A. $\frac{2}{8} + \frac{3}{8}$ B. $\frac{2}{8} + \frac{2}{8}$ C. $\frac{1}{8} + \frac{3}{8}$	A. $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$ because $2 + 3 = 5$.
5	Write two different equations that decompose $\frac{9}{10}$ into exactly three fractions with denominator 10.	$\frac{9}{10} = \frac{1}{10} + \frac{3}{10} + \frac{5}{10}$; $\frac{9}{10} = \frac{2}{10} + \frac{3}{10} + \frac{4}{10}$
6	A student says that $\frac{2}{3} + \frac{2}{3} = \frac{4}{6}$. Is the student correct? Write the correct sum and explain.	No. $\frac{2}{3} + \frac{2}{3} = \frac{4}{3}$ because the denominator stays 3 and $2 + 2 = 4$.

PART 2 • APPLY IT

- $\frac{4}{5} = \frac{1}{5} + \frac{3}{5}$; $\frac{4}{5} = \frac{2}{5} + \frac{2}{5}$ Both equations split 4 fifths into two amounts with denominator 5. The numerators in each equation add to 4.
- $\frac{8}{10} = \frac{1}{10} + \frac{3}{10} + \frac{4}{10}$. The denominators are all 10, and $1 + 3 + 4 = 8$. Use three fractions with denominator 10. Choose numerators that add to 8, such as 1, 3, and 4.

CHALLENGE

$\frac{6}{10} = \frac{1}{10} + \frac{5}{10}$; $\frac{6}{10} = \frac{2}{10} + \frac{4}{10}$; $\frac{6}{10} = \frac{3}{10} + \frac{3}{10}$. These are all the ways because the first numerator can be 1, 2, or 3. Larger first numerators only reverse a listed pair.

Accept addends in either order when the problem does not set an addend order. Accept other valid same-denominator decompositions when a problem asks for one possible equation.