

Fraction Piece Puzzles

Build, break apart, and total equal-size fraction pieces.

GRADE 3 • 3.NS.3.d

3.NS.3.d "Compose and decompose fractions (proper and improper) with denominators of 2, 3, 4, 5, 6, 8, and 10 in multiple ways (e.g., $74 = 44 + 34$ or $46 = 36 + 16 = 26 + 26$) with models."

NAME _____

DATE _____

SAME-SIZE PIECES

When you add or split fractions with the same denominator, keep the denominator and add or split the numerators. A fraction-strip model shows equal-size pieces. An improper fraction has enough pieces to make one or more wholes.

WORKED EXAMPLE

Decompose $7/8$ with a fraction-strip model.

1. Model: $[1/8][1/8][1/8] + [1/8][1/8][1/8][1/8]$
2. The first group has 3 eighths.
3. The second group has 4 eighths.
4. Add the parts: $3/8 + 4/8 = 7/8$.

Answer: $7/8 = 3/8 + 4/8$

PRACTICE 6 problems

- 1** Fraction-strip pieces: $[1/3][1/3] + [1/3]$.
Write the total fraction: ____.

ANSWER _____

- 2** Five sixth-size pieces are split into 1 piece and ____ pieces. Write the missing fraction:
 $5/6 = 1/6 + \underline{\hspace{1cm}}$.

ANSWER _____

- 3** Fraction-strip pieces: $[1/4][1/4][1/4] + [1/4][1/4]$. Write the total fraction: ____.

ANSWER _____

- 4** Nine fifth-size pieces are split into one whole and some extra pieces. Complete the equation: $9/5 = 5/5 + \underline{\hspace{1cm}}$.

ANSWER _____

- 5** Fraction-strip pieces: $[1/10][1/10][1/10][1/10] + [1/10][1/10][1/10] + [1/10][1/10]$.
Write the total fraction: ____.

ANSWER _____

- 6** Eleven half-size pieces are grouped into five wholes and one extra piece. Complete the equation: $11/2 = 2/2 + 2/2 + 2/2 + 2/2 + 2/2 + \underline{\hspace{1cm}}$.

ANSWER _____

APPLY IT Show your work

- 1** In a video game, Eli earns $\frac{4}{10}$ of a power bar in one round, $\frac{3}{10}$ in the next round, and $\frac{2}{10}$ in the last round. Use an equation model to show the parts. What fraction of a full power bar does Eli earn?

WORK SPACE

ANSWER _____

- 2** Nora has $\frac{9}{4}$ meters of string for craft bracelets. She uses $\frac{4}{4}$ meter for one bracelet and $\frac{2}{4}$ meter for another bracelet. Use a fraction-strip equation to show all three parts. How much string is left?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Write two different equation models for $\frac{13}{6}$. One model must include two wholes, using $\frac{6}{6}$ for each whole. Then explain why both models equal $\frac{13}{6}$.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Fraction-strip pieces: $[1/3][1/3] + [1/3]$. Write the total fraction: ____.	3/3
2	Five sixth-size pieces are split into 1 piece and ____ pieces. Write the missing fraction: $5/6 = 1/6 + \underline{\hspace{1cm}}$.	4/6
3	Fraction-strip pieces: $[1/4][1/4][1/4] + [1/4][1/4]$. Write the total fraction: ____.	5/4
4	Nine fifth-size pieces are split into one whole and some extra pieces. Complete the equation: $9/5 = 5/5 + \underline{\hspace{1cm}}$.	4/5
5	Fraction-strip pieces: $[1/10][1/10][1/10][1/10] + [1/10][1/10][1/10] + [1/10][1/10]$. Write the total fraction: ____.	9/10
6	Eleven half-size pieces are grouped into five wholes and one extra piece. Complete the equation: $11/2 = 2/2 + 2/2 + \underline{\hspace{1cm}}$.	1/2

PART 2 • APPLY IT

- $4/10 + 3/10 + 2/10 = 9/10$** Add the numerators because all the pieces are tenths. Eli earns 9/10 of a full power bar.
- $9/4 = 4/4 + 2/4 + 3/4$; 3/4 meter is left.** Split 9 fourths into 4 fourths, 2 fourths, and the remaining 3 fourths. The leftover string is 3/4 meter.

CHALLENGE

$13/6 = 6/6 + 6/6 + 1/6$. $13/6 = 4/6 + 4/6 + 5/6$. Both models have 13 sixth-size pieces.

Accept equivalent values when they match the fraction-piece model, such as 1 for 3/3. For items that ask for a fraction with a named denominator, have students keep that denominator in their written answer.