

Fraction Build-Up

Build fractions greater than 1 from unit fractions.

GRADE 4 • 4.NF.B.3

CCSS.Math.Content.4.NF.B.3 "Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$."

NAME _____

DATE _____

BUILD WITH UNIT FRACTIONS

A fraction greater than 1 can be built from unit fractions. Keep the same denominator, then write $1/b$ once for each part named by the numerator. Count the unit fractions to check your work.

WORKED EXAMPLE

Write $11/8$ as a sum of unit fractions.

1. The denominator is 8, so each unit fraction is $1/8$.
2. The numerator is 11, so write eleven copies of $1/8$.
3. $1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 = 11/8$

Answer: $11/8 = 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8$

PRACTICE 6 problems

- 1 Write $7/4$ as a sum of unit fractions.

ANSWER _____

- 2 Which sum equals $6/5$? A. $1/5 + 1/5 + 1/5 + 1/5 + 1/5 + 1/5$ B. $1/5 + 1/5 + 1/5 + 1/5 + 1/5$ C. $1/6 + 1/6 + 1/6 + 1/6 + 1/6$

ANSWER _____

- 3 Find the fraction: $1/3 + 1/3 + 1/3 + 1/3 =$ _____.

ANSWER _____

- 4 Complete the equation: $9/7 =$ _____. Write only unit fractions.

ANSWER _____

- 5 A student writes $7/6$ as $1/6 + 1/6 + 1/6 + 1/6 + 1/6 + 1/6$. What should be changed?

ANSWER _____

- 6 How many $1/12$ terms are needed to make $13/12$?

ANSWER _____

APPLY IT Show your work

- 1** In an adventure game, each checkpoint fills $\frac{1}{4}$ of a map meter. Kai finishes 10 checkpoints. Write the total filled meter as a sum of unit fractions.

WORK SPACE

ANSWER _____

- 2** The school garden uses $\frac{1}{6}$ of a bag of soil for each raised bed. The garden club fills 14 raised beds. Write the total amount of soil as a sum of unit fractions.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A student writes $\frac{15}{12}$ as twelve copies of $\frac{1}{12}$ plus $\frac{3}{12}$. Is this written using only unit fractions? Rewrite $\frac{15}{12}$ using only unit fractions and explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Write $\frac{7}{4}$ as a sum of unit fractions.	$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$
2	Which sum equals $\frac{6}{5}$? A. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ B. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ C. $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$	A. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$
3	Find the fraction: $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \underline{\hspace{1cm}}$.	$\frac{4}{3}$
4	Complete the equation: $\frac{9}{7} = \underline{\hspace{1cm}}$. Write only unit fractions.	$\frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7}$
5	A student writes $\frac{7}{6}$ as $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$. What should be changed?	Add one more $\frac{1}{6}$: $\frac{7}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$
6	How many $\frac{1}{12}$ terms are needed to make $\frac{13}{12}$?	13

PART 2 • APPLY IT

- $\frac{10}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ Each checkpoint adds $\frac{1}{4}$ of a meter. Ten checkpoints make ten copies of $\frac{1}{4}$, or $\frac{10}{4}$.
- $\frac{14}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$ Each bed uses $\frac{1}{6}$ of a bag. Fourteen beds make fourteen copies of $\frac{1}{6}$, or $\frac{14}{6}$.

CHALLENGE

No. $\frac{3}{12}$ is not a unit fraction because its numerator is 3. $\frac{15}{12} = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12}$.

Accept unit-fraction terms in any order. Require the denominator to stay the same and the number of $\frac{1}{b}$ terms to match the numerator, a simplified fraction alone does not show the target skill.