

LESSON

Problem Solving**5-4****Regrouping to Subtract Mixed Numbers**

Write the correct answer in simplest form.

- The average person in the United States eats $6\frac{13}{16}$ pounds of potato chips each year. The average person in Ireland eats $5\frac{15}{16}$ pounds. How much more potato chips do Americans eat a year than people in Ireland?

- The average person in the United States eats $270\frac{1}{16}$ pounds of meat each year. The average person in Australia eats $238\frac{1}{2}$ pounds. How much more meat do Americans eat a year than people in Australia?

- The average Americans eats $24\frac{1}{2}$ pounds of ice cream every year. The average person in Israel eats $15\frac{4}{5}$ pounds. How much more ice cream do Americans eat each year?

- People in Switzerland eat the most chocolate—26 pounds a year per person. Most Americans eat $12\frac{9}{16}$ pounds each year. How much more chocolate do the Swiss eat?

- The average person in the United States chews $1\frac{9}{16}$ pounds of gum each year. The average person in Japan chews $\frac{7}{8}$ pound. How much more gum do Americans chew?

- Norwegians eat the most frozen foods— $78\frac{1}{2}$ pounds per person each year. Most Americans eat $35\frac{15}{16}$ pounds. How much more frozen foods do people in Norway eat?

Circle the letter of the correct answer.

- Most people around the world eat $41\frac{7}{8}$ pounds of sugar each year. Most Americans eat $66\frac{3}{4}$ pounds. How much more sugar do Americans eat than the world's average?
A $25\frac{7}{8}$ pounds more
B $25\frac{1}{8}$ pounds more
C $24\frac{7}{8}$ pounds more
D $24\frac{1}{8}$ pounds more
- The average person eats 208 pounds of vegetables and $125\frac{5}{8}$ pounds of fruit each year. How much more vegetables do most people eat than fruit?
F $83\frac{5}{8}$ pounds more
G $82\frac{3}{8}$ pounds more
H $123\frac{5}{8}$ pounds more
J $83\frac{3}{8}$ pounds more

LESSON Challenge
5-4 Popular First Names

What are the most popular first names in the United States?

Regroup fractions or mixed numbers to solve each problem below. Write your answers in simplest form. Then, in the box at the bottom of the page, write each problem's letter in the blanks above its solution. When you have solved all the problems, you will have found the answer to the question.

$8\frac{7}{12} - 7\frac{3}{4}$	$\frac{5}{6}$	A
$9\frac{1}{8} - 8\frac{3}{4}$	$\frac{3}{8}$	E
$10\frac{1}{3} - 9\frac{2}{3}$	$\frac{2}{3}$	J
$6\frac{1}{2} - 5\frac{4}{5}$	$\frac{7}{10}$	M
$5\frac{1}{5} - 4\frac{4}{5}$	$\frac{2}{5}$	R
$7\frac{2}{9} - 6\frac{2}{3}$	$\frac{5}{9}$	S
$12\frac{2}{5} - 11\frac{1}{2}$	$\frac{9}{10}$	Y

#1 Name For American Men: $\frac{J}{3}$ $\frac{A}{6}$ $\frac{M}{10}$ $\frac{E}{8}$ $\frac{S}{9}$

#1 Name For American Women: $\frac{M}{10}$ $\frac{A}{6}$ $\frac{R}{5}$ $\frac{Y}{10}$

LESSON Problem Solving
5-4 Regrouping to Subtract Mixed Numbers

Write the correct answer in simplest form.

- The average person in the United States eats $6\frac{13}{16}$ pounds of potato chips each year. The average person in Ireland eats $5\frac{15}{16}$ pounds. How much more potato chips do Americans eat a year than people in Ireland?
 $7\frac{7}{8}$ pound more
- The average person in the United States eats $270\frac{1}{16}$ pounds of meat each year. The average person in Australia eats $238\frac{1}{2}$ pounds. How much more meat do Americans eat a year than people in Australia?
 $31\frac{9}{16}$ pounds more
- The average Americans eats $24\frac{1}{2}$ pounds of ice cream every year. The average person in Israel eats $15\frac{4}{5}$ pounds. How much more ice cream do Americans eat each year?
 $8\frac{7}{10}$ pounds more
- The average person in the United States chews $1\frac{9}{16}$ pounds of gum each year. The average person in Japan chews $\frac{7}{8}$ pound. How much more gum do Americans chew?
 $\frac{11}{16}$ pound more
- People in Switzerland eat the most chocolate—26 pounds a year per person. Most Americans eat $12\frac{9}{16}$ pounds each year. How much more chocolate do the Swiss eat?
 $13\frac{7}{16}$ pounds more
- Norwegians eat the most frozen foods— $78\frac{1}{2}$ pounds per person each year. Most Americans eat $35\frac{15}{16}$ pounds. How much more frozen foods do people in Norway eat?
 $42\frac{9}{16}$ pounds more

Circle the letter of the correct answer.

- Most people around the world eat $41\frac{7}{8}$ pounds of sugar each year. Most Americans eat $66\frac{3}{4}$ pounds. How much more sugar do Americans eat than the world's average?
A $25\frac{7}{8}$ pounds more
B $25\frac{1}{8}$ pounds more
C $24\frac{7}{8}$ pounds more
D $24\frac{1}{8}$ pounds more
- The average person eats 208 pounds of vegetables and $125\frac{5}{8}$ pounds of fruit each year. How much more vegetables do most people eat than fruit?
F $83\frac{5}{8}$ pounds more
G $82\frac{3}{8}$ pounds more
H $123\frac{5}{8}$ pounds more
J $83\frac{3}{8}$ pounds more

LESSON Reading Strategies
5-4 Compare and Contrast

When you subtract whole numbers, you often need to regroup a number before you can subtract.

$$\begin{array}{r} 7\ 13 \\ 83 \\ -17 \\ \hline \end{array}$$

In the above example, there were only 3 ones—not enough to subtract 7. A ten was regrouped as ten ones. The ten ones were added to the three ones to make 13 ones. Now there are enough ones to subtract 7.

You can compare regrouping fractions to regrouping whole numbers.

$$\begin{array}{r} 3\frac{1}{8} \\ -1\frac{3}{8} \\ \hline \end{array}$$

Look at the fractions first. There aren't enough eighths to subtract $\frac{3}{8}$ from $\frac{1}{8}$. Regrouping fractions is different from regrouping whole numbers, because you regroup a whole number as a fraction. You can regroup 1 as a fraction with the same numerator and denominator.

$$1 = \frac{2}{2} \quad 1 = \frac{5}{5} \quad 1 = \frac{8}{8}$$

$$\begin{array}{r} 2\frac{9}{8} \\ 3\frac{1}{8} \\ -1\frac{3}{8} \\ \hline \end{array}$$

Take one from three and regroup as it $\frac{8}{8}$. Combine $\frac{8}{8}$ with $\frac{1}{8}$ to make $\frac{9}{8}$. Now there are enough eighths to subtract.

$$1. \text{ What is } \frac{9}{8} - \frac{3}{8} ? \underline{\frac{6}{8}}$$

2. What is the same about subtracting whole numbers and subtracting fractions?

Numbers may have to be renamed.

3. What is different about subtracting whole numbers and subtracting fractions?

When you subtract whole numbers, you rename whole numbers. With fractions you rename a whole number as a fraction.

LESSON Puzzles, Twisters & Teasers
5-4 Subtraction Chains

Start with the first number in the chain. Subtract the next number, and the next, and the next. If, however, the next number to be subtracted is larger than your current answer, end the chain. Circle the last number you were able to subtract in that chain.

Example chain: | 7 | 2 | 4 | 3 | 7 - 2 = 5. 5 - 4 = 1. Stop now, because 3 is larger than your current answer. Circle 4, the last number you were able to subtract.

1.

$1\frac{2}{3}$	$1\frac{1}{3}$	$\frac{2}{3}$	$3\frac{1}{3}$
O	H	N	J

2.

$3\frac{1}{7}$	$1\frac{5}{7}$	$\frac{5}{7}$	$\frac{4}{7}$
U	I	M	E

3.

$5\frac{1}{5}$	$3\frac{3}{5}$	$\frac{4}{5}$	$1\frac{1}{5}$
C	Y	T	H

4.

$4\frac{1}{8}$	$1\frac{5}{8}$	$2\frac{5}{8}$	$\frac{1}{8}$
B	A	W	E

5.

$3\frac{3}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{7}{12}$
V	F	R	S



Now you are ready to solve the riddle. Place the letters for the circled numbers in the numbered spaces and you will have your answer!

In a contest at a local restaurant, the restaurant owner hung two sirloins from the ceiling. Anyone who could jump up and get one won a free dinner. A customer came in, but when he was asked if he would like to try, he responded: "No thanks,

$\frac{T}{3}$ $\frac{H}{1}$ $\frac{E}{2}$ $\frac{S}{5}$ $\frac{T}{3}$ $\frac{E}{2}$ $\frac{A}{4}$ K $\frac{S}{5}$ $\frac{A}{4}$ R $\frac{E}{2}$
 $\frac{T}{3}$ O O $\frac{H}{1}$ I G $\frac{H}{1}$