

Lesson: Estimating Products

4th Grade Objective: 1.02b Estimation of products and quotients in appropriate situations.

Lesson:

Estimate first and use that estimated answer to check the actual result after solving. $8 \times 67 = ?$

67 can be rounded up to 70, or $67 \approx 70$.

Therefore $8 \times 67 \approx 8 \times 70 = 560$.

$$\begin{array}{r} 5 \\ 67 \\ \times 8 \\ \hline 356 \end{array}$$

Oops! 356 is far from the estimation 560. There must be an error. Can you find it?

$$\begin{array}{r} 5 \\ 67 \\ \times 8 \\ \hline 536 \end{array}$$

This result sounds right, because it is fairly close to 560.

Before we start using estimation as a checking method, let's review the rounding rules.

When rounding to nearest ten,

- If the last digit is 0, 1, 2, 3, or 4, round down to the previous ten.
- If the last digit is 5, 6, 7, 8, or 9, round up to the next ten.

The symbol \approx is used to indicate rounding, and is read as "is approximately" or "is about".

Examples: $34 \approx 30$ $143 \approx 140$ $704 \approx 700$
 $598 \approx 600$ $255 \approx 260$ $705 \approx 710$

Example 2	$91 \approx 90$ $4 \times 91 \approx$ $4 \times 90 = 360$	$\begin{array}{r} 91 \\ \times 4 \\ \hline 364 \end{array}$
Example 3	$34 \approx \underline{\quad}$ $6 \times 34 \approx$ $6 \times \underline{\quad} = \underline{\quad}$	$\begin{array}{r} 34 \\ \times 6 \\ \hline \end{array}$
Example 4	$99 \approx \underline{\quad}$ $5 \times 99 \approx$ $5 \times \underline{\quad} = \underline{\quad}$	$\begin{array}{r} 99 \\ \times 5 \\ \hline \end{array}$
Example 5	$48 \approx \underline{\quad}$ $3 \times 48 \approx$ $3 \times \underline{\quad} = \underline{\quad}$	$\begin{array}{r} 48 \\ \times 3 \\ \hline \end{array}$
Example 6	$91 \approx \underline{\quad}$ $5 \times 91 \approx$ $5 \times \underline{\quad} = \underline{\quad}$	$\begin{array}{r} 91 \\ \times 5 \\ \hline \end{array}$

Practice:

1) 58 people are invited to the party; you are going to the store to buy supplies. You figure that for each person you need two cups, two plates, and three napkins. How many cups, plates, and napkins do you approximately need?

2) A can of beans costs 29 cents. A bag of lentils costs 42 cents. Estimate which is cheaper: to buy 8 cans of beans or to buy 5 bags of lentils.

3) Jill needs 21 inches of material to make a skirt. *About* how much should she buy for seven skirts?

Now, add to the answer above 10 inches to make sure she has enough. The material costs 1 dollars per each 9 inches (or 4 dollars a yard). How much will it cost Jill to buy what she needs? Draw a picture! You can for example mark the 9-inch strips in your picture and use that to help.

5) What if you have a situation similar to the one in a) but just with 92 people. How many cups, plates, and napkins would you need?

How many packages of each would you buy?