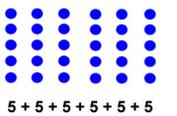


Multiplication: A SHORTCUT TO REPEATED ADDITION

Multiplication is a simpler way of doing repeated addition. Suppose Ron can do 30 push-ups in one minute. If he maintained a steady pace, how many push-ups could he do in five minutes? You could add $30 + 30 + 30 + 30 + 30$, or you could multiply 30×5 to arrive at the answer of 150 push-ups. Some words and symbols used in multiplication are *times*, *the product of*, the "x" sign, or a dot like ".". Sometimes numbers that are being multiplied will be put in parentheses $(30)(5)=150$.

Example 1 - Each person on your six-person crew is carrying five quarts of water. How many quarts of water does your crew have in total?



$$5 \times 6 = 30$$

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The multiplication problem would be $5 \times 6 = 30$. This process is the same as adding 5 six times.

When larger numbers are involved, multiplication is much easier than the repeated addition.

Example 2 - Multiply 17 by 63.

$\begin{array}{r} 17 \\ \times 63 \\ \hline 51 \\ 1020 \\ \hline \end{array}$	<p>Step 1: Multiply the each digit of the top number by the number in ones column.</p>
$\begin{array}{r} 17 \\ \times 63 \\ \hline 51 \\ 1020 \\ \hline \end{array}$	<p>Step 2: Multiply each digit of the top number by the number in the tens column. Remember to fill a "0" in the ones column.</p>
$\begin{array}{r} 17 \\ \times 63 \\ \hline 51 \\ 1020 \\ \hline 1071 \end{array}$	<p>Step 3: Add the two products to get the result.</p>

FINAL ANSWER

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Step 1. Multiply the top number by the number in the ones spot, which is 3.
 $17 \times 3 = 51$

Step 2. Multiply by the number in the tens spot, or 60, by putting a "0" in the ones place and multiplying 17×6 .

1.4 Multiplication

$$17 \times 60 = 1020$$

Step 3. Add these together.

$$17 \times 63 = 51 + 1020 = 1071$$

Example 3 - Multiply 374×261 .

Follow the same steps as shown above.

Step 1. Multiply 374 by 1.

Step 2. Multiply by 60. Put a "0" in the ones place and then multiply 374 by 6.

Step 3. Multiply by 200. Put "0" in the ones and tens places and then multiply 374 by 2.

Step 4. Add the numbers.

$$374 + 22,440 + 74,800 = 97,614$$

The answer to 374×261 is 97,614.

Multiplying Signed Numbers

When multiplying two numbers with the same sign, the answer will be a positive number. A positive number times a positive number always gives a positive answer.

$$5 \times 5 = 25$$

$$4 \times 8 = 32$$

$$2 \times 6 = 12$$

A negative number times a negative number always gives a positive answer.

$$-5 \times (-5) = 25$$

$$-5 \times (-10) = 50$$

$$-9 \times (-7) = 63$$

A positive number times a negative number always gives a negative answer.

$$5 \times (-5) = -25$$

$$-70 \times 8 = -560$$

$$24 \times (-2) = -48$$

Practice

1.4 Multiplication

1. Multiply 545×89 .

456
634
8505
48,505

Select the correct answer.

2. Multiply $7412 \times (-82)$.

7330
607,784
-607,784
-7330

Select the correct answer.