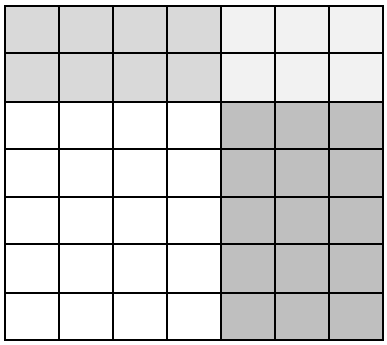
Name: _____ Using the Distributive Property Twice



The figure at the right is made up of little squares.

It has (2+5) rows and (4+3) columns.

That's (2 + 5) x (4 + 3) little squares in all.

There are:

(2 x 4) little squares in the upper left-hand group.
(2 x 3) little squares in the upper right–hand group.
(5 x 4) little squares in the lower left-hand group.
(5 x 3) little squares in the lower right-hand group.

Altogether, there are (2 x 4) + (2 x 3) + (5 x 4) + (5 x 3).

So, we have: **(2 + 5) x (4 + 3) = (2 x 4) + (2 x 3) + (5 x 4) + (5 x 3).**

Notice that the **4** and the **3** *each* get multiplied by *both* the **2** and the **5**; then all the partial products get added together.

What we've done is to apply the distributive law twice, once to the upper part of the figure (top 2 rows) and once again to the lower part (bottom 5 rows).

Now, let's use this method to multiply 21 x 34.

Expanding, we get (21 x 34) = (20 + 1) ▪ (30 + 4).

Now, the 30 and the 4 *each* get multiplied by *both* the 20 and the 1.

21 x 34 = (20 + 1) ▪ (30 + 4) = (20 x 30) + (20 x 4) + (1 x 30) + (1 x 4)

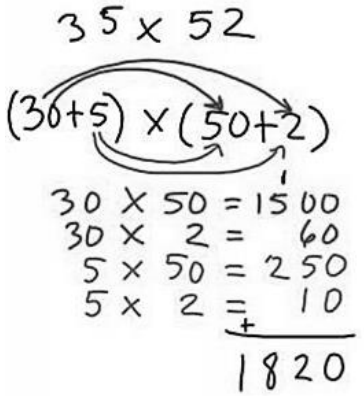
= 600 + 80 + 30 + 4

= **714**

We can multiply any *two* 2-digit numbers this same way—expand and apply the distributive property twice.

Just remember that the ***value*** *of each digit* of one number must get multiplied by the ***value*** *of each digit* of the other number.

At the right, 52 is multiplied by 35. Notice that the 50 and the 2 are *each* multiplied by *both* the 30 and the 5.



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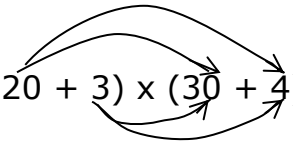
Multiply using the distributive property:



23 x 34 = (20 + 3) x (30 + 4) = (20x30) + (20x4) + (3x30) + (3x4)

= 600 + 80 + 90 + 12

= **782**

Your Turn:

1. 15 x 32 =

2. 19 x 14 =

3. 23 x 31 =