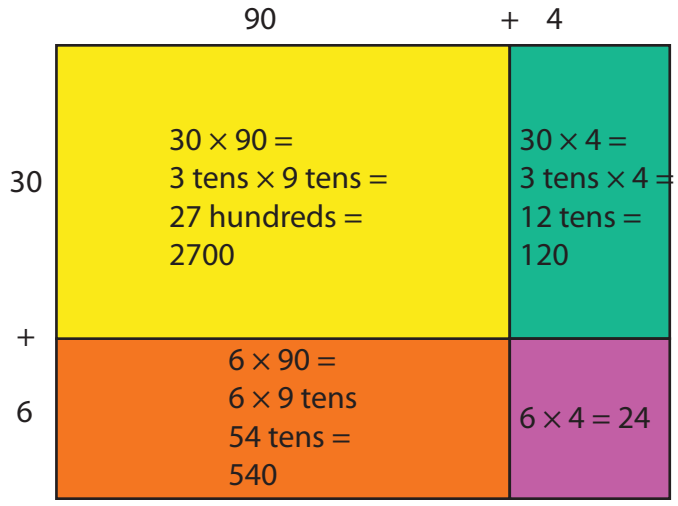
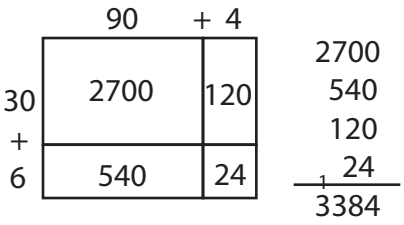
Written Methods for the Standard Multiplication Algorithm, 2-digit × 2-digit

Array/area drawing for 36 × 94

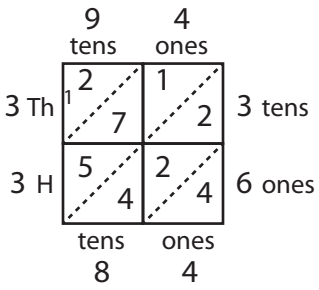


36 × 94 = (30 + 6)×(90 + 4)
= 30×90 + 30×4 + 6×90 + 6×4

Area Method 1:



Lattice Method 5:



Method 2:

Showing the partial products

94
× 36

thinking:

24 — 6 × 4
540 — 6 × 9 tens
120 — 3 tens × 4
2700 — 3 tens × 9 tens

1
3384

Method 3:

Recording the carries below for correct place value placement

94
× 36

5 2
44
2 1
720
1
3384

0 because we are multiplying by 3 tens in this row

Method 4:

94
× 36

2
564
1
2820
1
3384

Traditional Method 6:

94
× 36

564
1
2820
3384

Written Methods 2 and 3 are shown from right to left, but could go from left to right.

In Methods 3 and 4, digits that represent newly composed tens and hundreds in the partial products are written below the line intead of above 94. This way, the 1 from 30 × 4 = 120 is placed correctly in the hundreds place, unlike in Traditional Method 6, where it is placed in the (incorrect) tens place. In Method 4, the 2 tens from 6 × 4 = 24 are added to the 4 tens from 6 × 90 = 540 and then crossed out so they will not be added again; the situation is similar for the 1 hundred from 30 × 4 = 120.

In Method 3, all multiplying is done first and then all adding. In Method 4 and Traditional Method 6, multiplying and adding alternate, which is more difficult for some students.

Note that the 0 in the ones place of the second line of Methods 3, 4, and 6 is there because the whole line of digits is produced by multiplying by 30 (not 3).