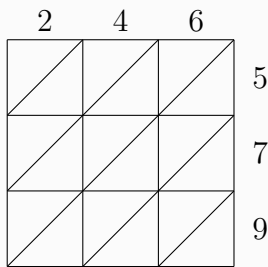# Activity: Lattice Multiplication

Lattice multiplication is a method of multiplication that uses a specially constructed grid to represent long multiplication. ⚙


Example 1: Multiply 246 and 579 using lattice multiplication.

Solution:

1. *Start by drawing a 3 by 3 grid with each cell split diagonally into two triangles as shown below. Arrange the multipliers along the top and right side of the grid (step 1).*

2. *Multiply digits that meet at each cell and write the result in the corresponding cell in such a way that tens are written above the diagonal and the ones are below the diagonal (step 2). For example the first column (2 written above), and the first row (5 written on the right) define the top left cell that contains the result of multiplication $2 \cdot 5 = 10$ with 1 above, and 0 below the diagonal.*

3. *Add numbers on the diagonals starting with the least significant digit (bottom right) and write the least significant digit of the sum along the left and right sides of the grid. If there is a tens digit carry it on to the next diagonal (step 3). In this case, we start with the diagonal that has number 4 in it. This is the sum of this diagonal, write 4 below the last column. The 2nd diagonal from the bottom has numbers 2, 5, and 6 in it. Their sum is 13. We write 3 and carry 1 into the diagonal above. Now there is 1 (that we carried on) + 0 + 4 + 8 + 3 + 8 = 24. Write 4 and carry 2 into the next diagonal...*

4. *Read the result of multiplication starting from the top left and moving toward the bottom right: $246 \cdot 579 = 142\,434$.*
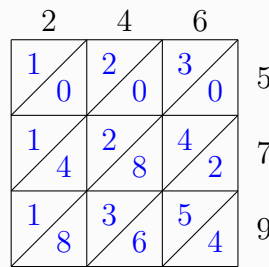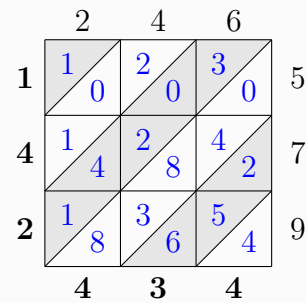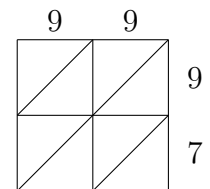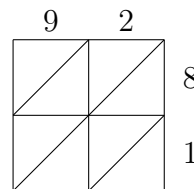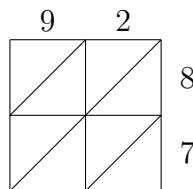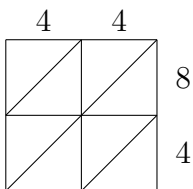

step 1   step 2   step 3

Problem 1: Complete the following lattice multiplications.

Problem 2: Complete the following lattice multiplications.

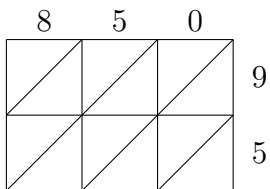|	5	0	2	
				1
				6
				1

	4	9	7	
				7
				6
				6

	8	4	6	
				2
				0
				4

	2	9	9	
				3
				7
				4

	5	1	8	
				9
				4
				4

	7	5	2	
				7
				7
				9
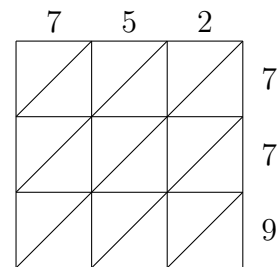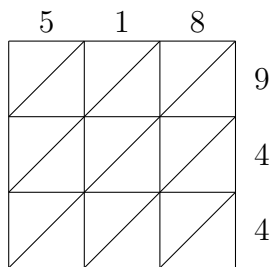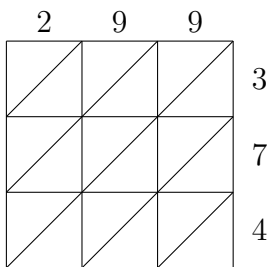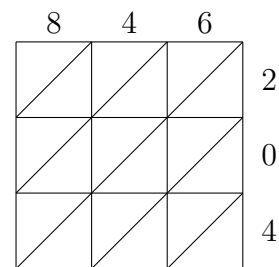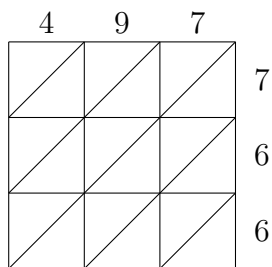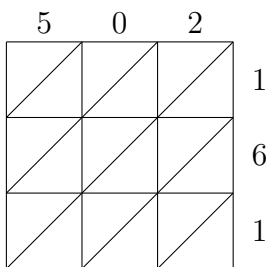
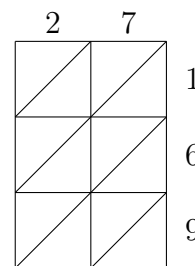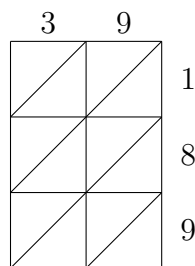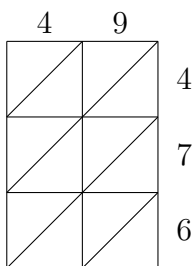**Problem 3:** Complete the following lattice multiplications.

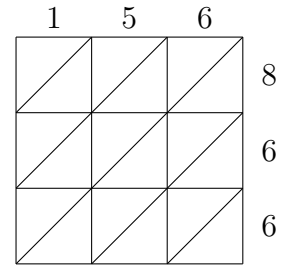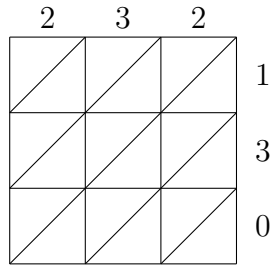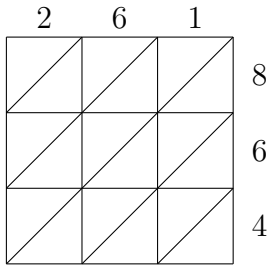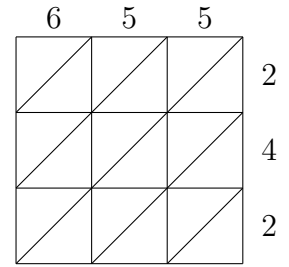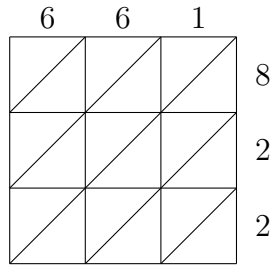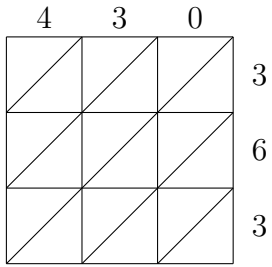|	4	9	
			4
			7
			6

	3	9	
			1
			8
			9

	2	7	
			1
			6
			9

	8	5	0	
				9
				5

	4	9	3	
				5
				7

	3	7	8	
				1
				6

	3	9	5	
				7
				8

	7	7	6	
				6
				7

	8	8	7	
				4
				3
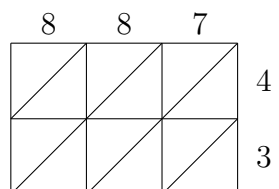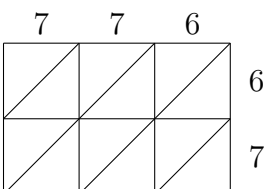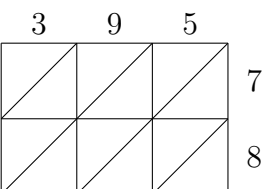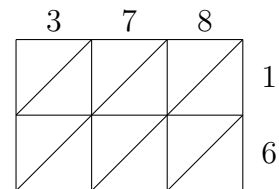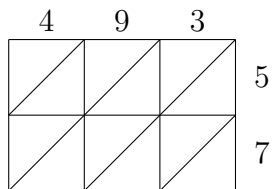
Problem 4: Complete the following lattice multiplications.

4	3	0	
			3
			6
			3

6	6	1	
			8
			2
			2

6	5	5	
			2
			4
			2

2	6	1	
			8
			6
			4

2	3	2	
			1
			3
			0

1	5	6	
			8
			6
			6

Problem 5: Use lattice multiplications to multiply the following numbers.

$23 \cdot 347 =$

$88 \cdot 572 =$
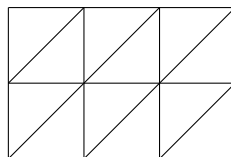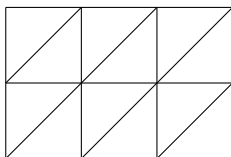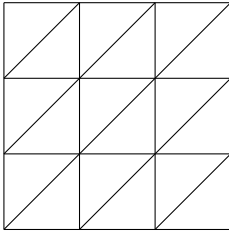
$95 \cdot 256 =$
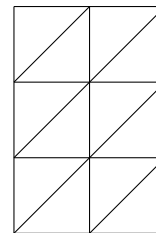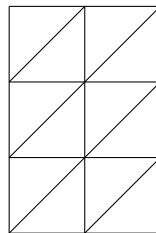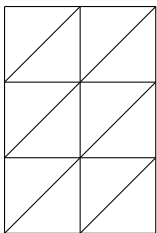
$566 \cdot 72 =$
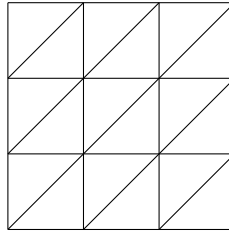
$585 \cdot 96 =$

$851 \cdot 57 =$
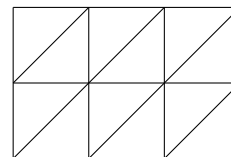
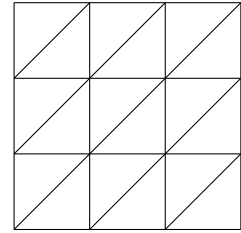**Problem 6:** Use lattice multiplications to multiply the following numbers.
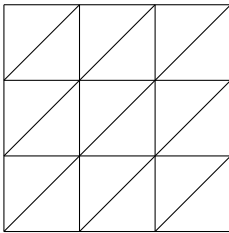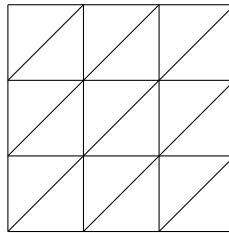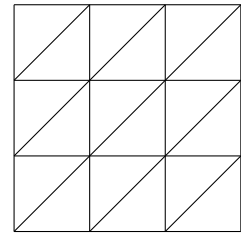
a) $588 \cdot 596 =$

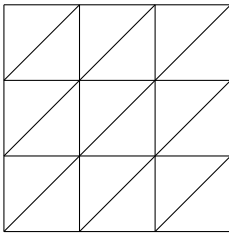b) $618 \cdot 169 =$

c) $860 \cdot 920 =$
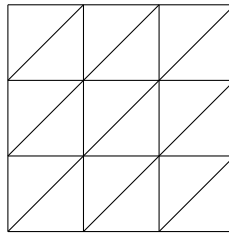
d) $387 \cdot 669 =$

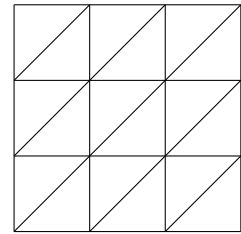e) $702 \cdot 598 =$

f) $432 \cdot 467 =$
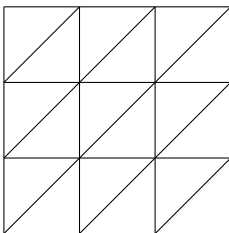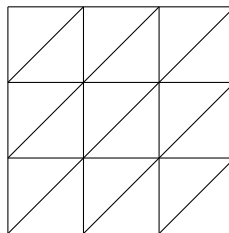
g) $671 \cdot 849 =$

h) $632 \cdot 209 =$

i) $766 \cdot 364 =$

j) $907 \cdot 886 =$

k) $723 \cdot 431 =$

l) $159 \cdot 635 =$