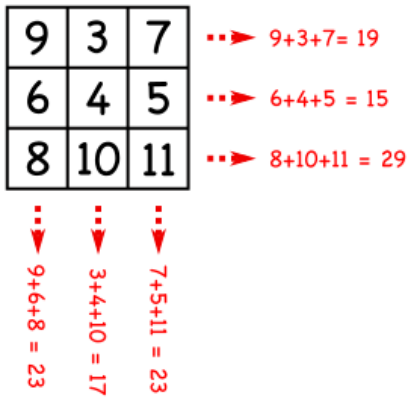
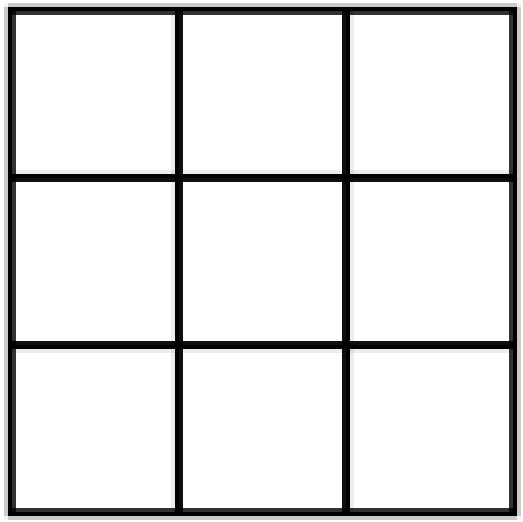
Puzzle of the Week
Prime Squares

The first few prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, and 23. A *Prime Square* is a square grid of numbers in which the numbers in each row and column add up to a prime number. This 3 by 3 square, which uses the numbers from 3 to 11, is almost a Prime Square - it fails because the second row adds up to 15, which is not a prime!



THE CHALLENGE: Use the numbers from 1 to 9 to form a 3 by 3 Prime Square.



1 2 3 4 5 6 7 8 9

Puzzle of the Week
Prime Squares – Notes

THE CHALLENGE: A good way to warm up for this puzzle is to start with the Odd Squares Puzzle. Because the only even prime number is too small to be the sum of three positive numbers, we know all the sums for this puzzle will be odd numbers. As mentioned in the Notes section of that puzzle, for a row and column to add up to an odd number, it must have 1 or 3 odd numbers in it. Because there are a total of 5 odd numbers, that means one row will have 3 odd numbers and two rows will have one odd number. Similarly, one column will have 3 odd numbers and two columns will have one odd number.

ODD	ODD	ODD
EVEN	EVEN	ODD
EVEN	EVEN	ODD

We can slide the rows and columns around and not really change the answer in an interesting way, so we might as well assume that the answer looks like this:

The challenge now is to pick numbers that will add up to primes. There are lots of ways to do this, perhaps too many!

Things can be slid around without creating an answer that is really different, so we can assume that 2 is in the upper left corner of even numbers, and the upper right corner is less than the lower left corner.

ODD	ODD	ODD
2	4	ODD
6	8	ODD

ODD	ODD	ODD
2	4	ODD
8	6	ODD

ODD	ODD	ODD
2	6	ODD
8	4	ODD

Here are the answers with (2 4) (8 6) for the two rows of even numbers::

1	7	3
2	4	5
8	6	9

1	7	9
2	4	5
8	6	3

3	9	1
2	4	7
8	6	5

3	9	7
2	4	1
8	6	5

7	1	3
2	4	5
8	6	9

7	1	9
2	4	5
8	6	3

9	3	1
2	4	7
8	6	5

9	3	7
2	4	1
8	6	5