

Magic square:

Start with a Magic trick on Magic squares.

The magic squares have long fascinated human beings since ancient times. People believed that these squares possessed magic powers, which humans used as religious symbols, and were considered a magic shield. People dug them into stones and carried them to the belief that they protected their bearer from dangers and evils.

- A question was posed by **Martin LaBar** in 1984, Can a 3x3 magic square be constructed with nine distinct square numbers?
- The above question became famous when **Martin Gardner** republished it in 1996 and offered \$100 to the first person to construct such a square. Two years later, Gardner wrote, so far no one has come forward with a “square of squares” – but no one has proved its impossibility either. If it exists, its numbers would be huge, perhaps beyond the reach of today’s fastest computers.
- Today, this problem is not yet solved. Several other articles in various magazines have been published
- **John P. Robertson** showed that the problem is equivalent to other mathematical problems on arithmetic progressions, on Pythagorean right triangles, on congruent numbers and elliptic curves $y^2 = x^3 - n^2x$.
- **Lee Sallows** discussed the subject in *The Mathematical Intelligencer* presenting the nice square, a near-solution with only one bad sum.

*Three rows, three columns and one diagonal have the same magic sum $S_2=21609$.
But unfortunately the other diagonal has a different magic sum $S_2=38307$:*

127^2	46^2	58^2
2^2	113^2	94^2
74^2	82^2	97^2

Exploration:

1. Figure out the sequence in which the numbers need to be arranged in the magic card trick.
2. Create a formula for higher odd order Magic Squares.
3. Create a formula to find the central cell entry for any order Magic Squares.
4. Create a formula for the birth date Magic Square.
5. Find a pattern for the singly even magic squares

Interesting links for further fun with magic squares:

- <https://www.youtube.com/watch?v=aTSYARnB-3Y>
- <https://www.youtube.com/watch?v=aQxCnmhqZko>
- <https://www.youtube.com/watch?v=FANbncTMCGc&t=11s>
- https://www.youtube.com/watch?v=aOT_bG-vWyg
- <https://www.youtube.com/watch?v=FCczHiXPVcA>
- <https://www.youtube.com/watch?v=Kdsj84UdeYg>