

Ultimate Magic Square - Fun with Patterns



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Ultimate Magic Square



Magic in a rectangular grid -
let me count the ways!



Ultimate Magic Square

3x3 Introduction

8	1	6
3	5	7
4	9	2

What is the magic sum?
How many ways can you find it?



Ultimate Magic Square

3x3 Introduction

8	1	6
3	5	7
4	9	2

What is the magic sum?

How many ways can you find it?

fifteen
eight



Ultimate Magic Square

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

What is the magic sum?
How many ways can you find it?



Ultimate Magic Square

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

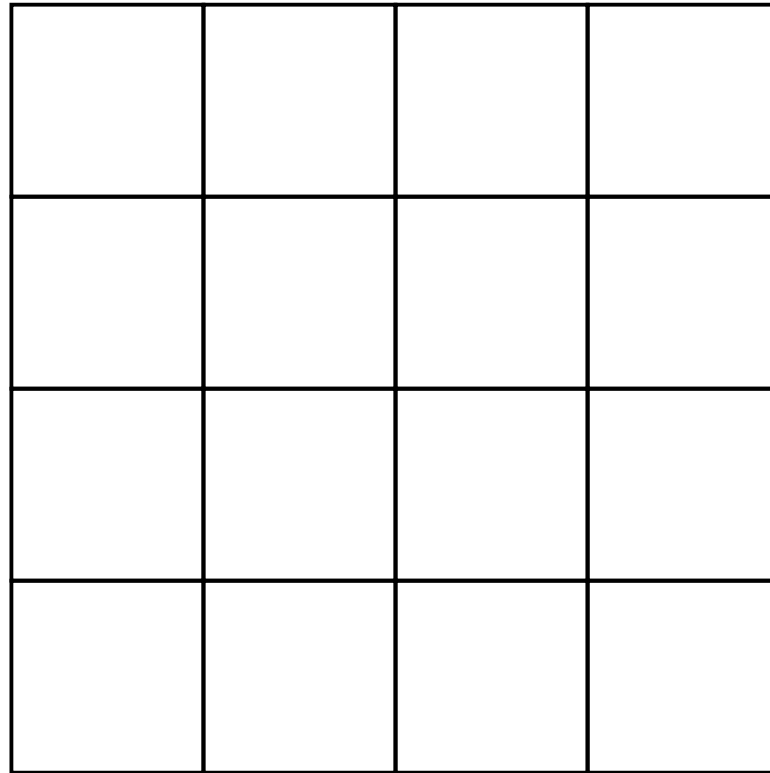
What is the magic sum?

How many ways can you find it?

**Thirty-four
mucho**



Ultimate Magic Square Construction



Create three 4x4 grids



Ultimate Magic Square Construction

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1. Start with a 1-16 grid



Ultimate Magic Square Construction

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

<i>16</i>	2	3	<i>13</i>
5	<i>11</i>	<i>10</i>	8
9	<i>7</i>	<i>6</i>	12
<i>4</i>	14	15	<i>1</i>

1. Start with a 1-16 grid

2. Reverse the diagonals



Ultimate Magic Square

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

2. From the last slide

3. Swap the two middle columns



Ultimate Magic Square

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Aha !! You're a mathemagician !!



Ultimate Magic Square History

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Albrecht Dürer made this in 1514.
Can you find the date?



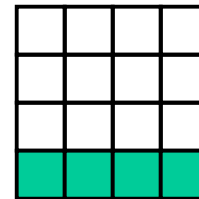
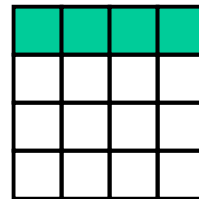
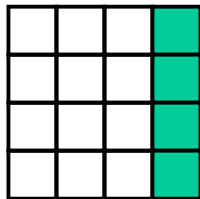
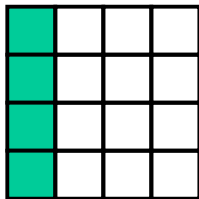
Ultimate Magic Square

CA 4th grade Standard 3.4

Identify figures that have bilateral and rotational symmetry.

CA Geometry Standard 22.0

Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translation, and reflections.



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5	10	11	8
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16	3	2	13
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9	6	7	12
4	15	14	1

Look for interesting patterns.



Ultimate Magic Square

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4	15	14	1

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5	10	11	8
9	6	7	12
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More interesting patterns.



Ultimate Magic Square

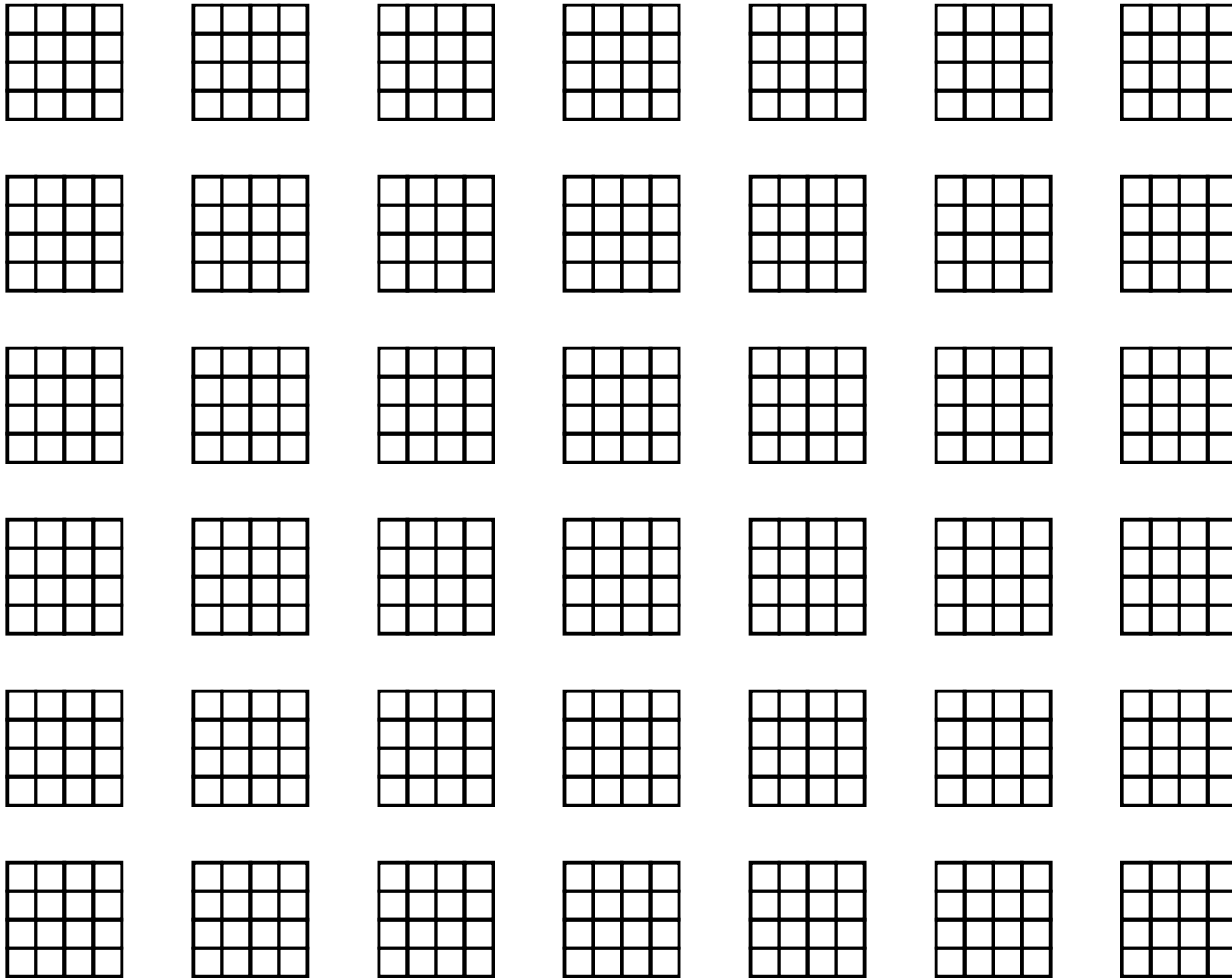
Good Tip! 

Have the students use grid paper to shade the squares which add up to the magic sum.

This will illustrate symmetry types and make a great project.



Ultimate Magic Square Wallpaper Grids



Ultimate Magic Square Grid Project

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

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5	10	11	8
9	6	7	12
4	15	14	1

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Ultimate Magic Square Grid Project

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Kite shapes



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