

# Smallest Perfect Magic Hypercubes

## THE SMALLEST PERFECT MAGIC HYPERCUBE

in a 0-Dimensional Space is a point with the number One assigned to it and is a trivial case.

## THE SMALLEST PERFECT MAGIC HYPERCUBES

in a 1-Dimensional Space does not exist.

## THE SMALLEST PERFECT MAGIC HYPERCUBES

in 2-Dimensional Space are Pandiagonal Magic Squares of Order 4. They were well known to the Jaina priests at Nasik, India around 1100 A.D.

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

Figure 1a. Diagonals including broken ones.

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

Figure 1b. Diagonals including broken ones.

All the numbers from 1 to 16 are arranged in such a way that the Magic Sum is; 34 in:

- 4 rows (parallel to x-axis).
- 4 columns (parallel y-axis)
- 8 diagonals (both continuous & broken)
- Altogether, 16 ways

## THE SMALLEST PERFECT MAGIC HYPERCUBES

in 3-Dimensional Space are Perfect Magic Cubes of Order 8. After many people had claimed the first one, Benson & Jacoby, in *Magic Cubes New Recreations* Dover, 1981 presented it in Chapter 5.

All the numbers from 1 to 512 are arranged in such a way that the Magic Sum is; 2,052 in:

- 64 rows (parallel to x-axis).
- 64 columns (parallel y-axis)
- 64 pillars (parallel to z-axis)
- 384 diagonals (both continuous & broken)
- 256 triagonals (both continuous & broken))

Altogether, 8323 ways which includes 24 Pandiagonal Magic Squares of Order 8.

## **THE SMALLEST PERFECT MAGIC HYPERCUBES**

**in 4-Dimensional Space are Perfect Magic Tesseracts of Order 16.**

**John R. Hendricks 21 May 1999. Dr. Clifford Pickover checked all additions by computer using about 10 hours of computer time.**

**All the numbers from 1 to 65,536 are arranged in such a way that the Magic Sum is; 524,296 in:**

**4,096 rows (parallel to x-axis). It contains 1536 perfect magic squares**

**\**  
**4,096 columns (parallel y-axis)**

**4,096 pillars (parallel to z-axis\**

**4,096 files (parallel to w-axis)**

**9,152 diagonals (both continuous & broken)**

**65,536 triagonals (both continuous & broken)**

**32,768 quadragonals (both continuous & broken)**

**Altogether, 163,840 ways, which includes 1536 perfect magic squares and 64 perfect magic cubes.**

## **THE SMALLEST PERFECT MAGIC HYPERCUBES**

**in 5-Dimensional Space are of Order 32**

**All the numbers from 1 to 33,554,432 arranged in such a way that the Magic Sum is; 536,870,928 in:**

**1,044,576 rows (parallel to x-axis)**

**1,044,576 columns (parallel y-axis)**

**1,044,576 pillars (parallel to z-axis)**

**1,044,576 files (parallel to w-axis)**

**1,044,576 posts (parallel to v-axis)**

**20,971,220 diagonals (both continuous & broken)**

**41,943,040 triagonals (both continuous & broken)**

**41,943,040 quadragonals (both continuous & broken)**

**16,777,216 pentagonals (both continuous & broken)**

**Altogether 126,877,696 ways. This includes 160 perfect Magic Tesseracts, 10,240 perfect Magic Cubes and 327,680 perfect Magic Squares.**

**The booklet, *Perfect n-Dimensional Magic Hypercubes of Order 2<sup>n</sup>* by John Hendricks shows how to make the smallest Perfect Hypercube of any dimension.**

**John Robert Hendricks**