

PUZZLED?

A Look at the Rubik's Cube



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Ernö Rubik



- Hungarian Architect
- Academy of Applied Arts and Design
 - Taught Interior Design

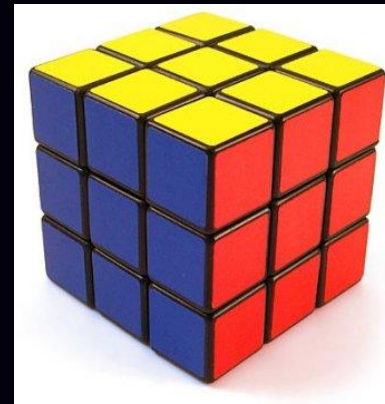
The Project

- Three-dimensional Geometry
 - River Danube: Pebbles
 - Elastic Bands
- Spring 1974: “Magic Cube”



Solving It Himself

“It was wonderful, to see how, after only a few turns, the colors became mixed, apparently in random fashion. It was tremendously satisfying to watch this color parade. Like after a nice walk when you have seen many lovely sights you decide to go home, after a while I decided it was time to go home, let us put the cubes back in order. And it was at that moment that I came face to face with the Big Challenge: What is the way home?” (Bellis)



Magic Cube to Rubik's Cube



- 1977: “Magic Cube” was patented and began appearing in Hungarian toy stores
- In 1980: Ideal Toy Corporation → Rubik's Cube
- “Best selling puzzle of ALL time!”

Why is it so Hard?

4.3×10^{19}

- Number of Combinations
 - ONLY ONE CORRECT SOLUTION!
- 1 Center Pieces
- 8 Corner Pieces:
 - $8! \times 2187 = 88,179,840$
- 12 Edge Pieces:
 - $12! \div 2 \times 2048 = 490,497,638,400$
- $88,179,840 \times 490,497,638,400 = ?$

ANSWER

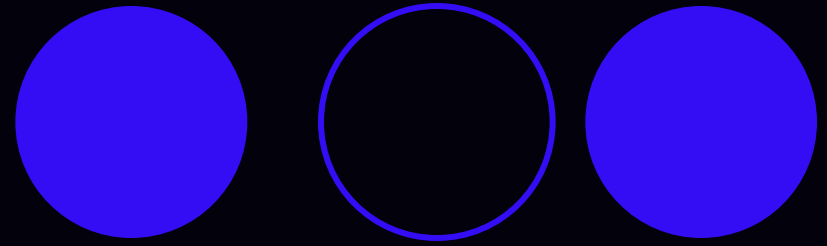
43,252,033,274,489,856,000

Algorithm

- Memorized sequence of moves
- God's Algorithm
 - 25 moves



Speed Cubing



- World Championships since 2003
 - 3x3x3, 4x4x4, & 5x5x5 Cubes
 - Blindfolded, one-handed, & feet
- “Cuber’s Wrist”



Rubik's Cube-based Math Curriculum

- 12 schools in New York City
- Geometry & Algebra
 - Direction following
 - Memorization
 - Perseverance
 - Sense of Accomplishment
- Seven Towns



Cube Facts

- Current World Record: 7.08 sec. (2008)
- Variations: 2x2x2, 3x3x3, 4x4x4, 5x5x5, 6x6x6, 7x7x7
- 2007: E-Cube
- 2009: Rubik's Touch Cube
- World's Largest Cube
 - 3 meters tall & 500+ kilograms
 - Knoxville, Tennessee





Conclusion

**It's still easier just
to pull off the
stickers and put
them back on
CORRECTLY!**

Work Cited

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A person wearing a multi-colored striped t-shirt is holding a large, oversized Rubik's cube. The cube is partially solved, with a blue face on the left and a green face on the right. The person's hands are visible at the bottom, gripping the cube. The background is dark and out of focus.

THANK YOU!