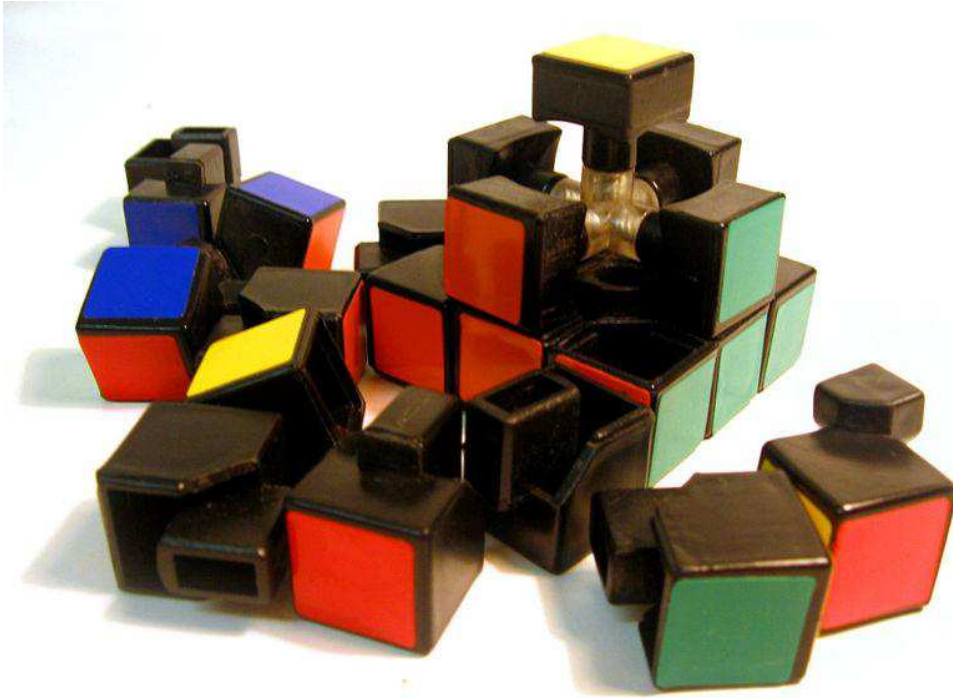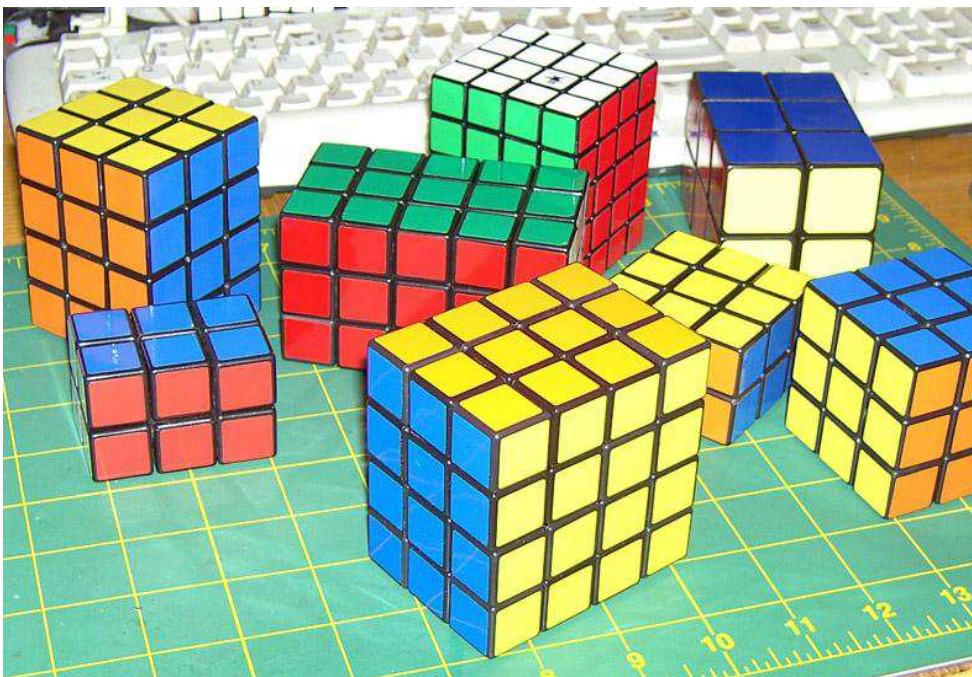Name: _____

Rubik's Cubes Stickers
And
Follow Up
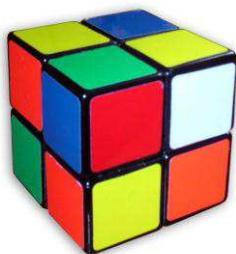# Activities
A – G

**Rubik's
Cube
with
Braille**

Rubik's Cube broken apart

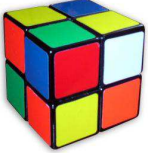**Different Size Rubik's Puzzles**

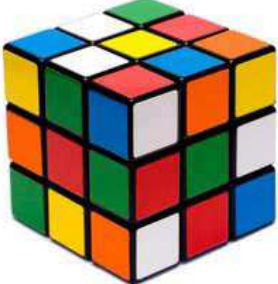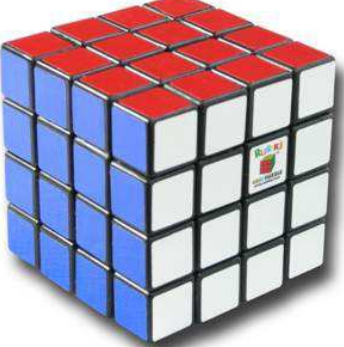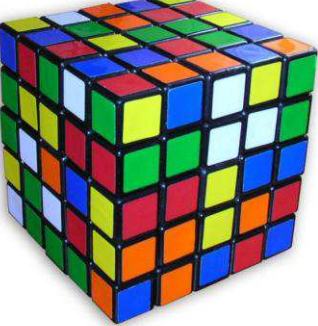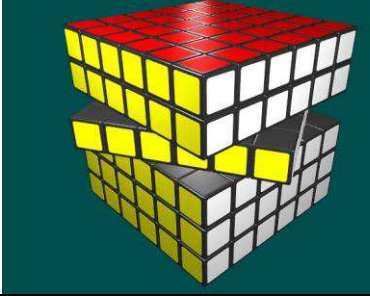# Rubik's Cube Stickers

A. The Rubik's Cube above is made of smaller cubes. How many smaller cubes are there?

B. Each of the exposed faces of each cube is covered with a sticker. Suppose you could break the Rubik's Cube into individual cubes. How many of the smaller cubes would have stickers on

1. Three faces? _____
2. Two faces? _____
3. One face? _____
4. No faces? _____

Answer the questions from above for each of the cubes in the table on the facing page.

C. Study the patterns in the table.
1. Describe the relationship between the edge length of the large cube and the total number of cubes.

2. Describe the relationship between the edge length of the large cube and the number of smaller cubes with stickers on
   a. Three faces
   b. Two faces
   c. One face
   d. Zero faces

3. Decide whether each relationship in parts (1) and (2) is linear, quadratic, exponential, or none of these.

Large Cube	Edge Length	Number of Smaller Cubes	Number of Smaller Cubes with Stickers On only			
			3 faces	2 faces	1 face	0 faces
	2					
	3					
	4					
	5					
	6					
Explicit Rule	e					

5

A

What if you had a 12 X 12 X 12 Rubik's Cube?

1)   How many smaller cubes would make up this Rubik's Cube?

2)   How many of the smaller cubes would have stickers on only three faces?

3)   How many of the smaller cubes would have a sticker on only two faces?

4)   How many of the smaller cubes would have a sticker on only one face?

5)   How many of the smaller cubes would have absolutely no stickers?

6)   How many of the smaller cubes would have stickers?

7)   If you would try to build a 12 X 12 X 12 Rubik's Cube, using your standard 3 X 3 X 3 Rubik's Cubes, how many would you need?

B
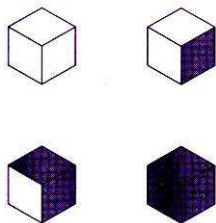
In a particular Rubik's Cube, 1000 smaller cubes have no stickers.

1)   What are the dimensions of this Rubik's Cube?

2)   How many of the smaller cubes have a sticker on only one face?

3)   How many of the smaller cubes have a sticker on only two faces?

4)   How many of the smaller cubes have a sticker on only three faces?

C

There is a Rubik's Cube of unknown size. Of the smaller cubes on this Rubik's Cube, 864 have a sticker on only one face.

1)   What are the dimensions of this Rubik's Cube?
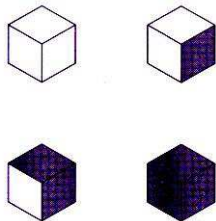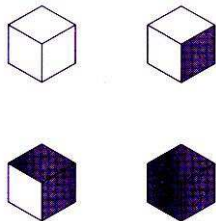
2)   How many of the smaller cubes would have no stickers?

3)   How many of the smaller cubes have a sticker on only two faces?

4)   How many of the smaller cubes have a sticker on only three faces?

D
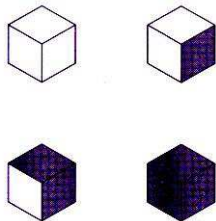
There is a Rubik's Cube of unknown size. Of the smaller cubes on this Rubik's Cube, 132 have stickers on only two faces.

1)   What are the dimensions of this Rubik's Cube?

2)   How many of the smaller cubes have no stickers?

3)   How many of the smaller cubes have a sticker on only one face?

4)   How many of the smaller cubes have a sticker on only three faces?

E
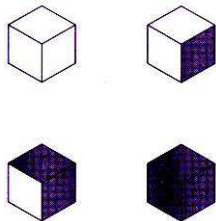
There is a Rubik's Cube of unknown size. Of the smaller cubes on this Rubik's Cube, 8 have stickers on only three faces.

1) What is the length of an edge of this Rubik's Cube?

2) How many of the smaller cubes would have no stickers?

3) How many of the smaller cubes would have a sticker on only one face?

4) How many of the smaller cubes would have a sticker on only two faces?

F

You have a Rubik's Cube with edges of length "*e*".

1) If the Rubik's Cube consists of 125 smaller cubes, what is the value of "e"?

2) If the Rubik's Cube has 343 smaller cubes that have no stickers, what is the value of "e"?

3) If the Rubik's Cube has 120 smaller cubes that have stickers on only two faces, what is the value of "e"?

4) If the Rubik's Cube has 486 smaller cubes that have a sticker on only one face, what is the value of "e"?

G
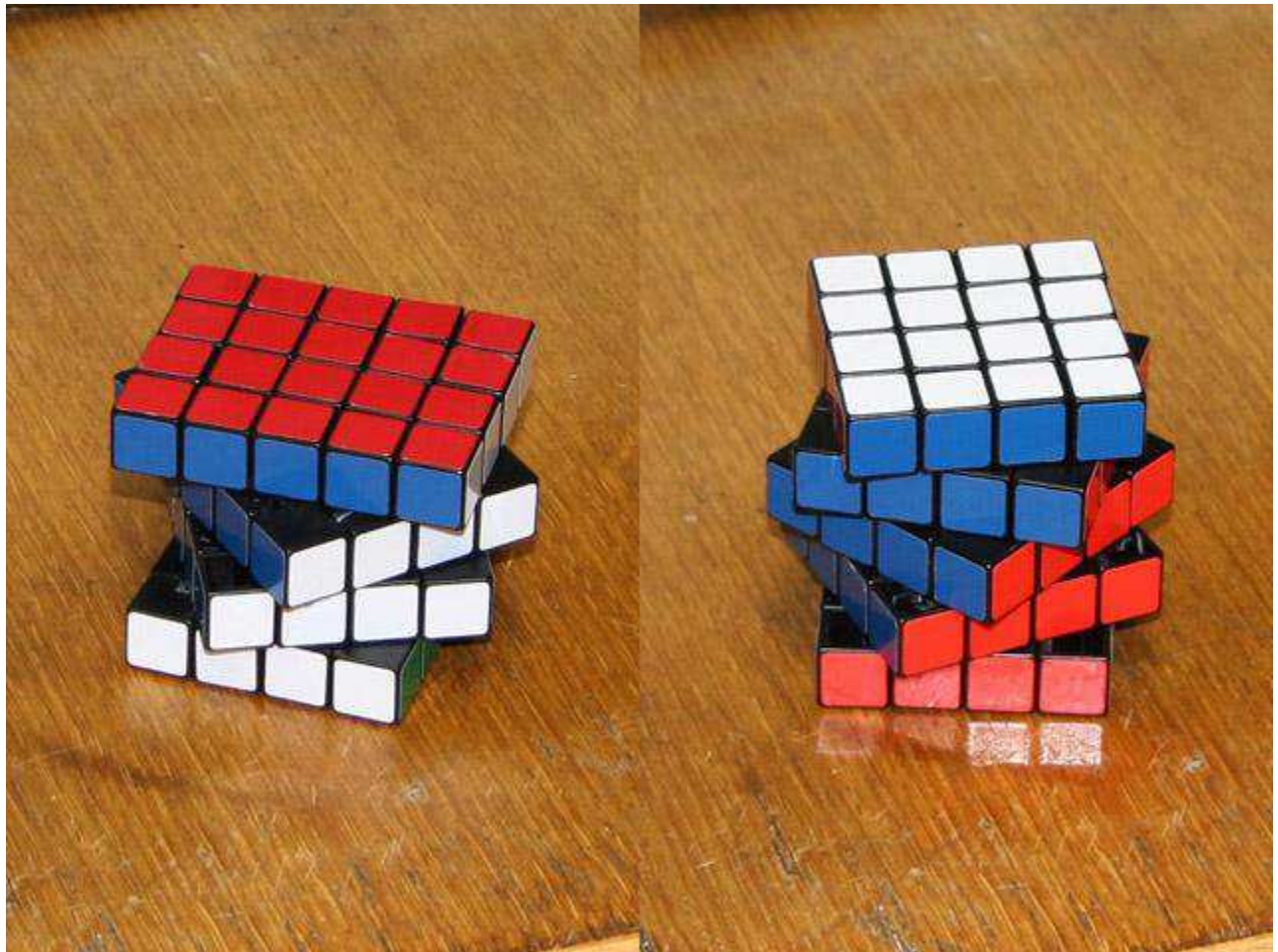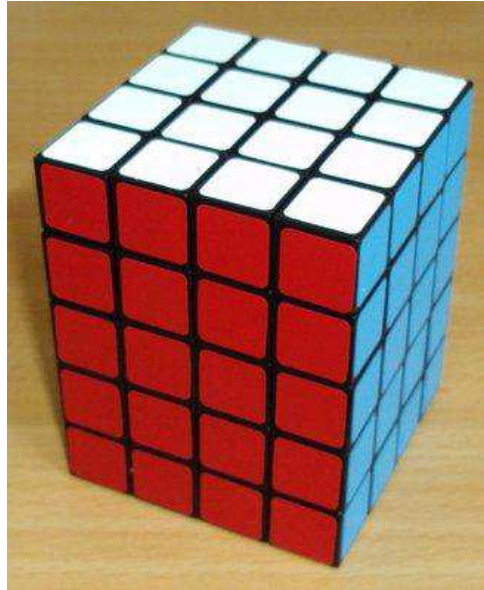
This Rubik's Puzzle pictured is not your typical Rubik's Puzzle because it is not a cube.

1)   Why is this puzzle not a cube?

2)   What is a geometric term we could use for this puzzle?

3)   What are its dimensions?

4)   How many smaller cubes does the puzzle contain?

5)   How many of the smaller cubes have a sticker on only three faces?

6)   How many of the smaller cubes have a sticker on exactly two faces?

7)   How many of the smaller cubes have a sticker on only one face?

8)   How many of the smaller cubes have no stickers?
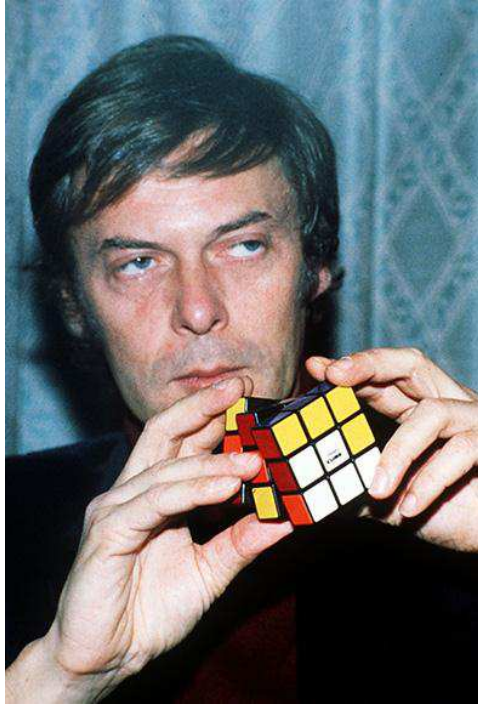
Erno Rubik

Jan. 30, 1975: Rubik Applies for Patent on Magic Cube

Who is Erno Rubik?

Ernõ Rubik (b. July 13, 1944) is a Hungarian inventor whose name is known globally due to the popularity of the cube puzzle that bears his name. Born in Budapest, Rubik studied sculpture in college, then architecture at the Academy of Applied Arts and Design, where he taught interior design and invented his world-famous puzzle cube. His invention went on to become the most popular puzzle game of all time, making Rubik the first self-made millionaire from the communist bloc.

The Invention of Rubik's Cube:

While working as a professor in Budapest, Rubik became intrigued with a structural design problem. He wanted to construct a cube with adjustable squares on each side that would move independently without the entire structure falling apart. In 1974, he came up with a solution, hand-carved the blocks and marked each side of the cube with a different color. He then tested his invention, twisting the blocks in various ways to see if they held together. It was only when he discovered how challenging it was to realign the colors to match on each side that he realized his invention could be used as a puzzle.

Too tough for mass appeal?

To date, the Rubik's Cube puzzle has sold over 350 million units. Surprisingly, when Rubik first approached toy companies they were cool to his idea and told him that the puzzle was too difficult for mainstream appeal. Undeterred, Rubik forged ahead and managed to introduce the puzzle in his home country of Hungary where it became very popular simply via word-of-mouth and without any large scale advertising.

The Cube Becomes an Eighties Sensation:

As the puzzle's popularity spread, it caught the attention of an American toy manufacturer that began selling it world-wide. The puzzle fell out of fashion in the late 1980s but made a comeback in the early '90s, appealing to a whole new generation of "cubes". It is still selling well today, more than thirty-five years later!

Speed Solving Competitions:

In 1982, the first international "Speedcubing" competition, a contest where the world's best "cubers" compete to see who can solve the Cube the fastest, was held. Today, various Rubik's Cube competitions are organized around the world by The World Cube Association.

As of 2009, the world record for solving time on a 3×3 Rubik's Cube was 7.08 seconds, set by Dutch solver Erik Akkersdijk at the Czech Open 2008.

The World's Best-Selling Puzzle:

With over 350 million units sold, Rubik's Cube holds the record as the world's best-selling puzzle toy. Today, there are many spin-offs of Rubik's Cube, some proving to be even more complex than the original. See *Rubik's Puzzles* for a list of the several variations of the cube as well as other puzzle games by Ernõ Rubik.

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