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Rubik's Snake

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A **Rubik's Snake** (also Rubik's Twist, Rubik's Transformable Snake, Rubik's Snake Puzzle) is a toy with twenty-four wedges shaped like right isosceles triangular prisms. The wedges are connected such that they can be twisted, but not separated. Through this twisting, the Rubik's Snake can attain positions including a straight line, a ball (technically a nonuniform concave rhombicuboctahedron), a dog, a duck, a rectangle, a snake and many more imaginative shapes and figures.

The toy doesn't require special "strategies" and improves creativity and spatial sense.

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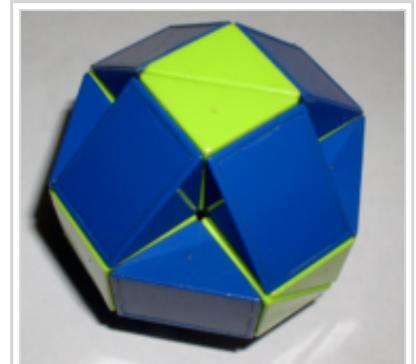
Structure

The 24 prism are aligned in row with an alternating orientation (normal and upside down). Each prism can adopt 4 different positions each with an offset of 90°. Usually the prisms have an alternating color.

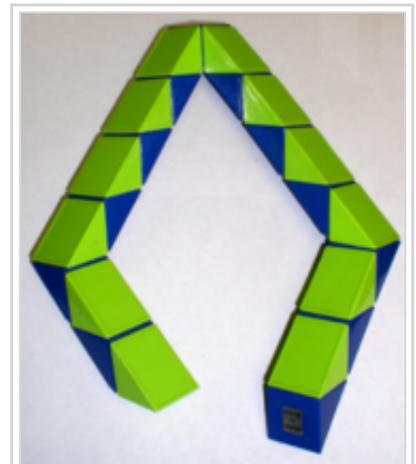
Notation

Twisting instructions

The description of an arbitrary shape or figure is based on a set of instructions of twisting the prisms. The starting point is a straight line, where the 12 prisms at the bottom are numbered from 1 to 12. The left and the right turning area of these prisms are labeled which L and R respectively. The four possible positions of the each turning area numbered with 0, 1, 2 and 3 (twist between the bottom prism and its



Snake in a ball solution.



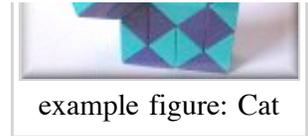
Snake bent in 4 sides.



example figure:
ThreePeaks



neighbor). The numbering is based on the first clockwise turn of a prism. The position 0 is the starting position and therefore isn't explicitly noted.



example figure: Cat

A twist is described as:

1. Number of the prism: 1 to 12
2. Left or right side of the prism: L or R
3. Position of the twist: 1, 2 or 3

- for example **Three Peaks**

6R1-6L3-5R2-5L3-4R2-4L1-1R1-3L3-3R2-7L2-7R3-8L1-8R2-9L1-9R2-10L3-12R3-11L1-10R2

- for example **Cats**

9R2-9L2-8L2-7R2-6R2-6L2-5L3-4L2-3R2-2R2-2L2

Machine processing

The position of the 23 turning areas can also be written directly after each other. Here the position 0, 1, 2 and 3 are always based on the degree of twist between the right-hand prisms relative to the left-hand prism, if you look at the axis of rotation from the right. But this notation is impractical for manual twisting, because you don't know in which order the twists occur.

- for example **Three Peaks**

10012321211233232123003

- for example **Cat**

02202201022022022000000

Mathematics

The number of theoretically different shapes of the Rubik's Snake is $4^{23} = 70368744177664 \sim 7 \cdot 10^{13}$

This number comes from the 4 different positions of each of the 23 turning areas.

The real number of different shapes is lower and still unknown. That's because some configurations are spatially impossible.

External links

- Official Rubik's Online Site (<http://www.rubiks.com/>)

- Collection of shapes and figures of Rubik's Snake (http://www.thomas-wolter.de/index_en.htm)
- Rubik's Snake on TwistyPuzzles.com (<http://www.twistypuzzles.com/cgi-bin/puzzle.cgi?pid=484>)

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Category: Mechanical puzzles

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