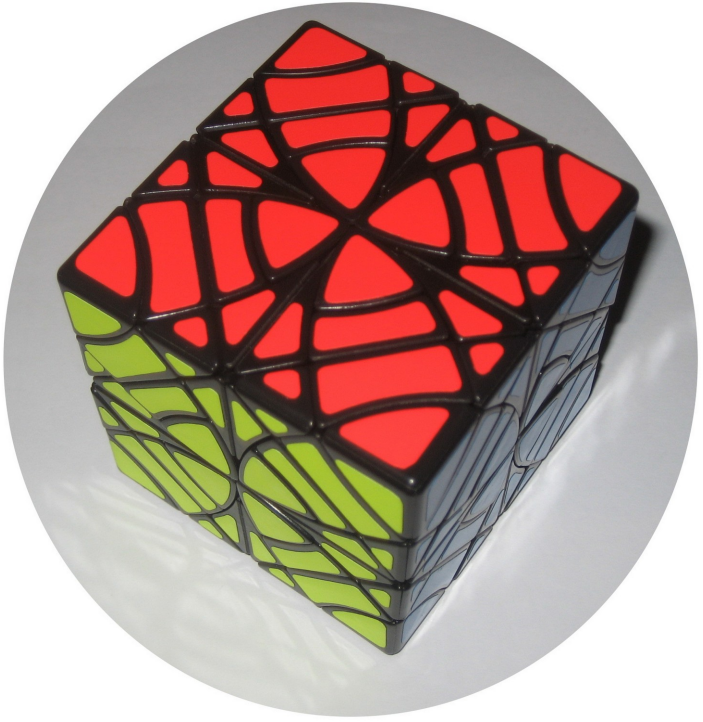
Exploring the Exploding Twins Cube

Dr. Goetz Schwandtner

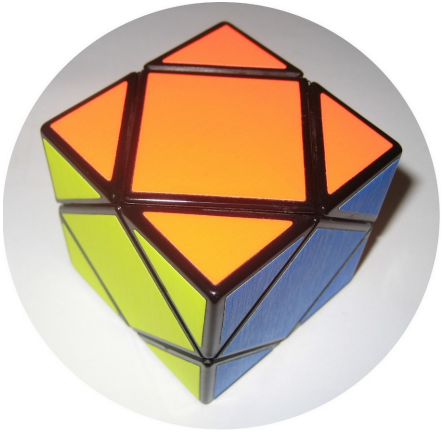
https://puzzles.schwandtner.info

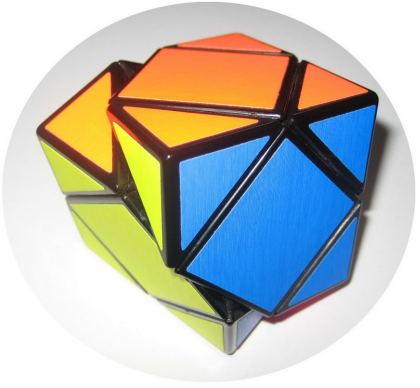
Twins Cube (Skewb Version)

Twins Cube (Skewb Version)



History of the Twins Cube





Skewb

Designer:	Tony Durham
Manufacturer:	Mefferts
Year:	1982

Deep-cut corner turning

History of the Twins Cube

Helicopter Cube

Designer:	Adam G. Cowan
Manufacturer:	The Twisty Store
Year:	2006

Edge turning

Introduced Jumbling

History of the Twins Cube

Curvy Copter

Designer:	Tom van der Zanden
Manufacturer:	Mefferts
Year:	2010

Edge turning

History of the Twins Cube

Curvy Copter Plus

Designer:	Tom van der Zanden
Manufacturer:	Mefferts
Year:	2010

Edge turning

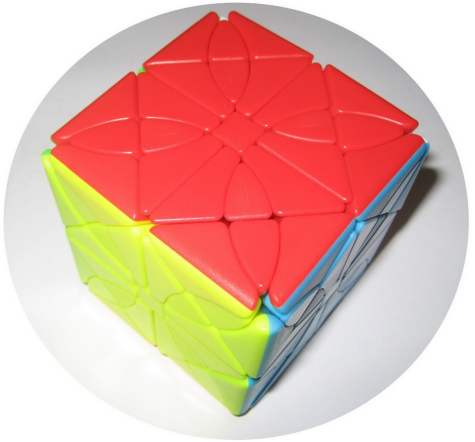
History of the Twins Cube

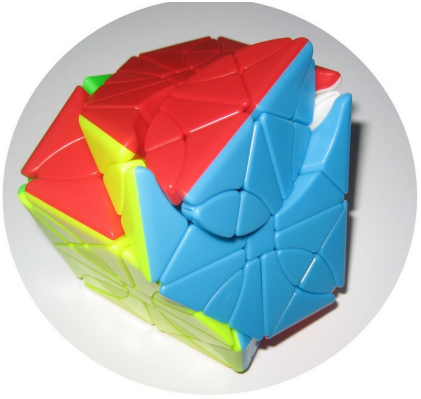
Skewby Copter Plus

Designer:	Diogo Sousa
Manufacturer:	MF8
Year:	2017

Edge turning
Deep-cut corner turning

History of the Twins Cube





Curvy Copter Extreme

Designer:	Guan Yang
Manufacturer:	Lim Cube
Year:	2019

Edge turning
Deep-cut corner turning

History of the Twins Cube

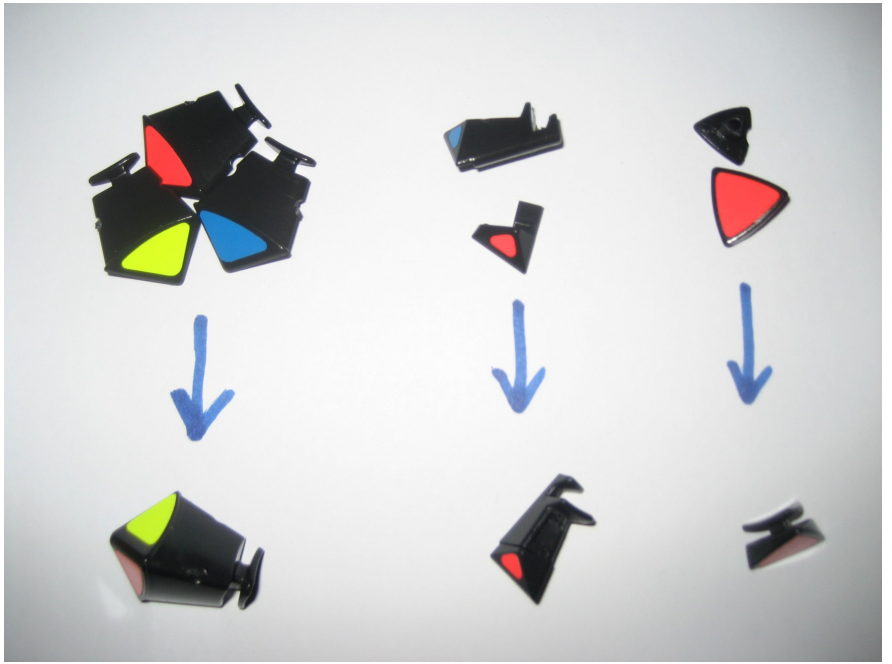
Twins Cube (Skewb Version)

Designer:	Mr. Fok
Manufacturer:	mf8
Year:	2019

Edge turning
Deep-cut corner turning

Exploding Twins Cube

- Many small pieces, can lock up/catch in strange angles, this can push out pieces.
- Stability improvement possible, just super glue some pieces together:



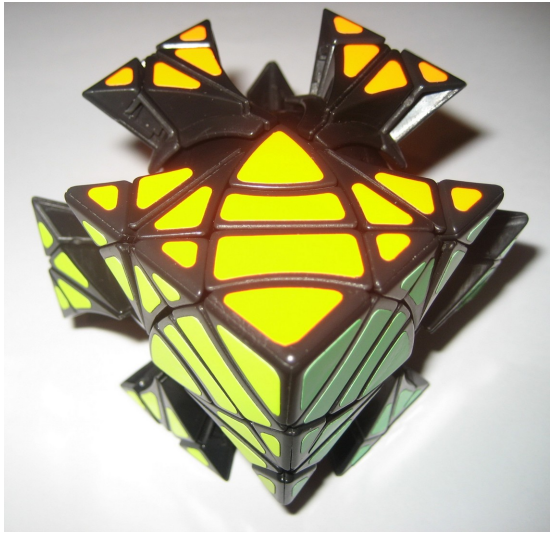
Twins Cube Reassembly

1st: place all edge pieces

Six pieces per edge, use corners to determine correct positions

2nd: Choose a corner and fill corners, starting from one center, then 2nd center, then corner, and fill up to 3rd center in this corner

3rd: iterate for all Remaining corners



How to Solve the Twins Cube?

How to Solve the Twins Cube?

A strategy in three phases:

1st Transform
to cube shape

2nd Reduce to
Curvy Copter +

3rd Solve
Curvy Copter +

Solving Phase 1.1: Make Cube Shape

Join edges and create edges like in cubic puzzle
by using Skewb moves and others to pair matching edge parts

Moves required:

Flatten “Valleys” / “Peaks”
by using Curvy Copter moves to place 3 or 6 valleys and peaks along a Skewb cut and then rearrange them by a Skewb move

Solving Phase 1.2: Make Cube Shape

Moves required:

Flatten “Ears”
by using standard Curvy Copter approach and ignoring the side centers and corners

“Ear” Parity:
If only one ear remains after this step, this is a parity situation. Use a Skewb move to create valley+peak+flat among Skewb cut, then solve using “Flatten Valleys/Peaks” step.

Fix Corners and Center pieces:
by using Curvy Copter + method. **First the corners** can be put into corner places, **then the center pieces** can be rotated using Curvy Copter + move sequences.

Solving Phase 2.1: Reduce to CC+

Moves required:

Pair Edge Centers
Prepare opposite pairs of edge centers and combine them with a Skewb move

Place Edge Triangles:
Take one corner as a guide and using Skewb and Curvy Copter moves, place the little edge triangles to the right position (and orientation). If required, place other corners to verify.

Solving Phase 2.2: Reduce to CC+

Prepare Parity Checks:
Using a standard Curvy Copter method, solve all the corners according to the edge triangles. Then:

Moves required:

Fix CC+ Parity:
If two corners need to be swapped only, then swap two centers using CC+ moves. Optional step, can also be done as last one.

Fix Skewby Copter Parity:
If one corner needs to be oriented, then rotate this corner using a Skewb move and then clean up using Skewb moves and Curvy Copter moves.

Solving Phase 2.3: Reduce to CC+

Place Edge Centers:
using a commutator with a Curvy Copter move and Skewb move sequence (also commutator)

Moves required:

Complete CC+ Petals:
Setting up matching incomplete CC+ petals along Skewb cuts, join these parts and move the joined petal aside with a “single jumble maneuver”.

Solving Phase 3.1: Solving the CC+

Moves required:

Join CC+ Centers and Petals:
using a short CC+ move sequence, swap CC+ centers to join the centers with the petals of the same colour

Place the Petals of the Top:
Choose a side and place all top petals.

NB: Pictures left show results from here on.

Complete Top Face:
Put all top corners in place and also maintain correct orientation of all adjacent edges.

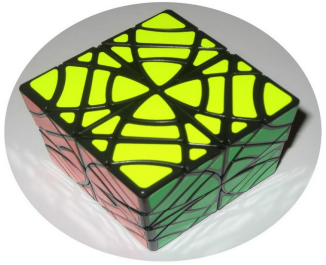
Solving Phase 3.2: Solving the CC+

Complete Upper Half:
Put petals in the upper half of the side faces in place.

Moves required:

Turn Puzzle over and solve bottom edges and petals:
First solve the bottom edges (at most one move per edge), then the petals of the bottom half of the sides, and the bottom face.

Solving Phase 3.3: Solving the CC+



Moves required:

Place Bottom Corners:
Put the corners in place, optionally using the “C” move scheme.

Orient Bottom Corners:
Use the move scheme of “running around the top” many times to orient all corners correctly, while maintaining all other pieces’ orientations.

Fix CC+ Parity:
If two corners need to be swapped only, then swap two centers using CC+ moves.

Solving Observations

- Typical reduction approach to known puzzles.
- Question for solution planning: In which order to solve the various elements?
- The solution presented starts with many different moves and reduces the number of different move types more and more.
- Also difficult to scramble and plan required!

References - Youtube

- Superantoniovivaldi's channel with various tutorials: https://www.youtube.com/user/SuperAntoniovivaldi/videos
  - Videos on solving a similar puzzle (Skewby Copter Plus) first part, links to parts 2 to 4 in the video description: https://www.youtube.com/watch?v=Ku4sCb1ZlfQ
  - Video on Curvy Copter Extreme: https://www.youtube.com/watch?v=brTHluYkJmQ

- Kevin Sadler's instructions on how to scramble the Skewby Copter: https://www.youtube.com/watch?v=V0WGQp6U_pk

Explored the Exploding Twins Cube!

https://puzzles.schwandtner.info