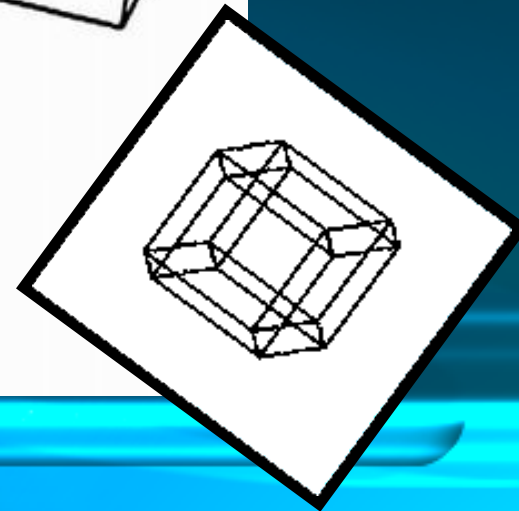
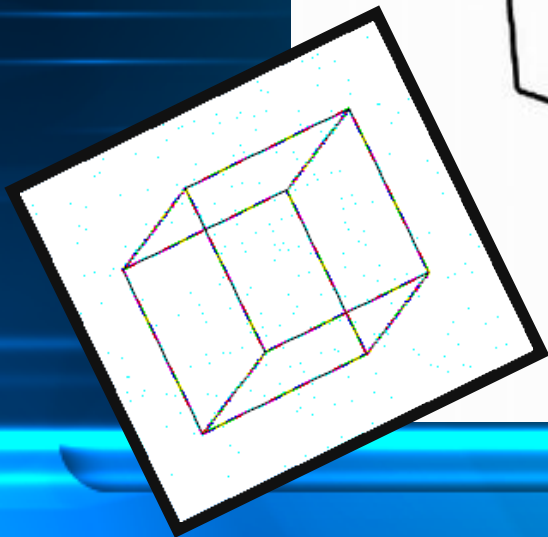
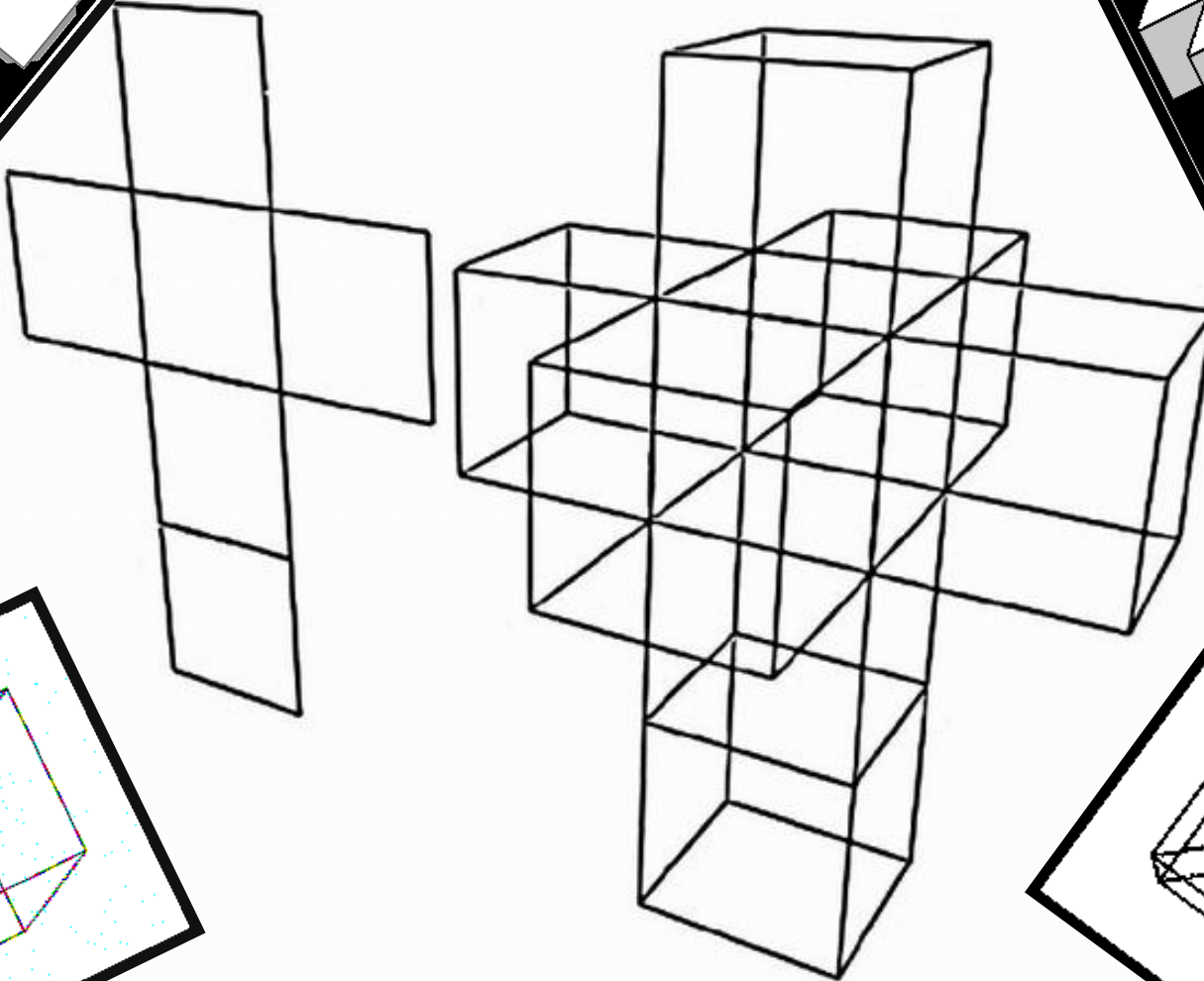
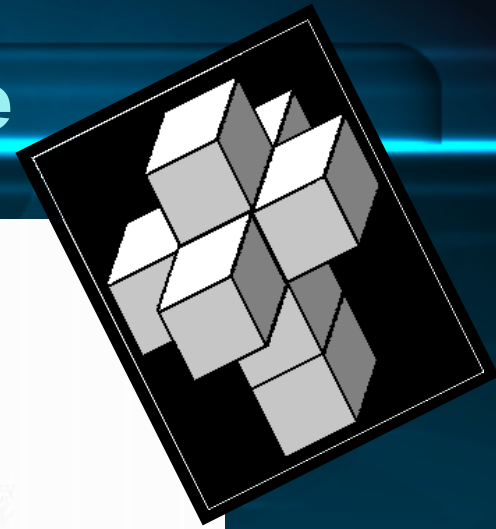


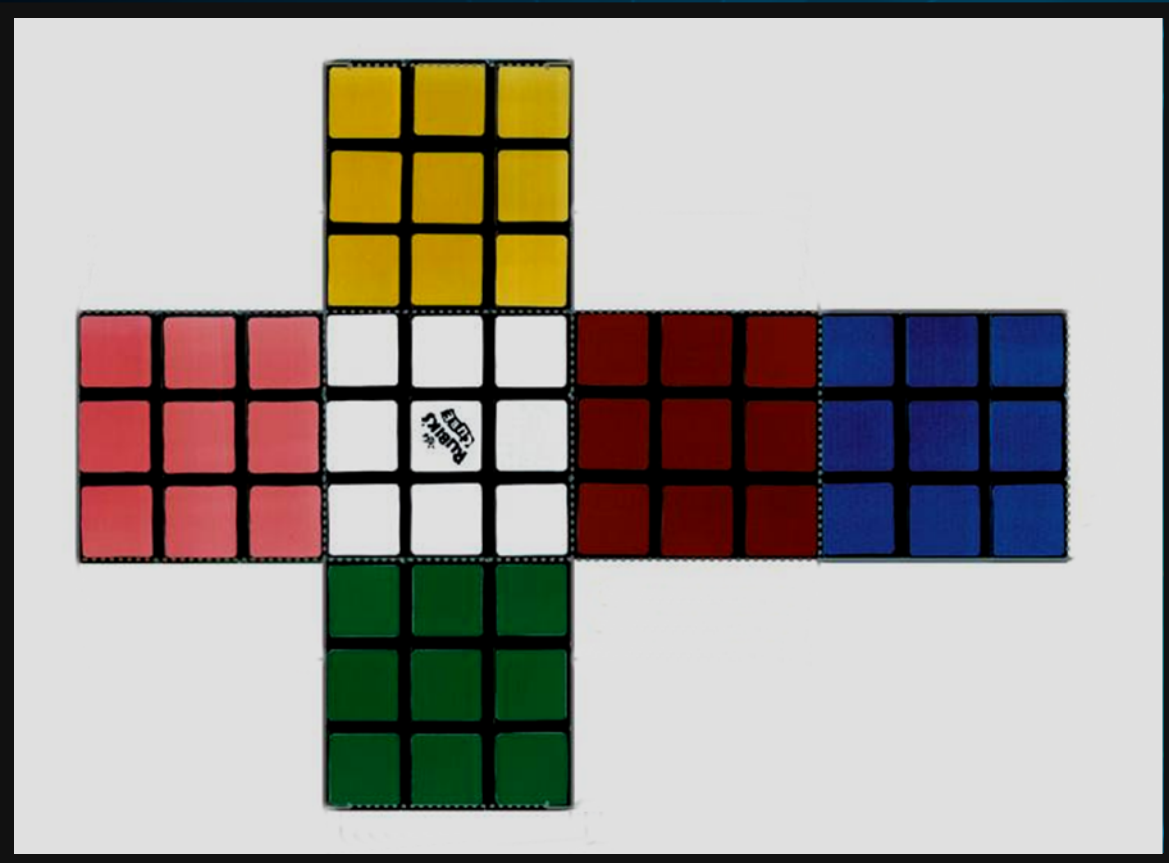
# Hypercubes

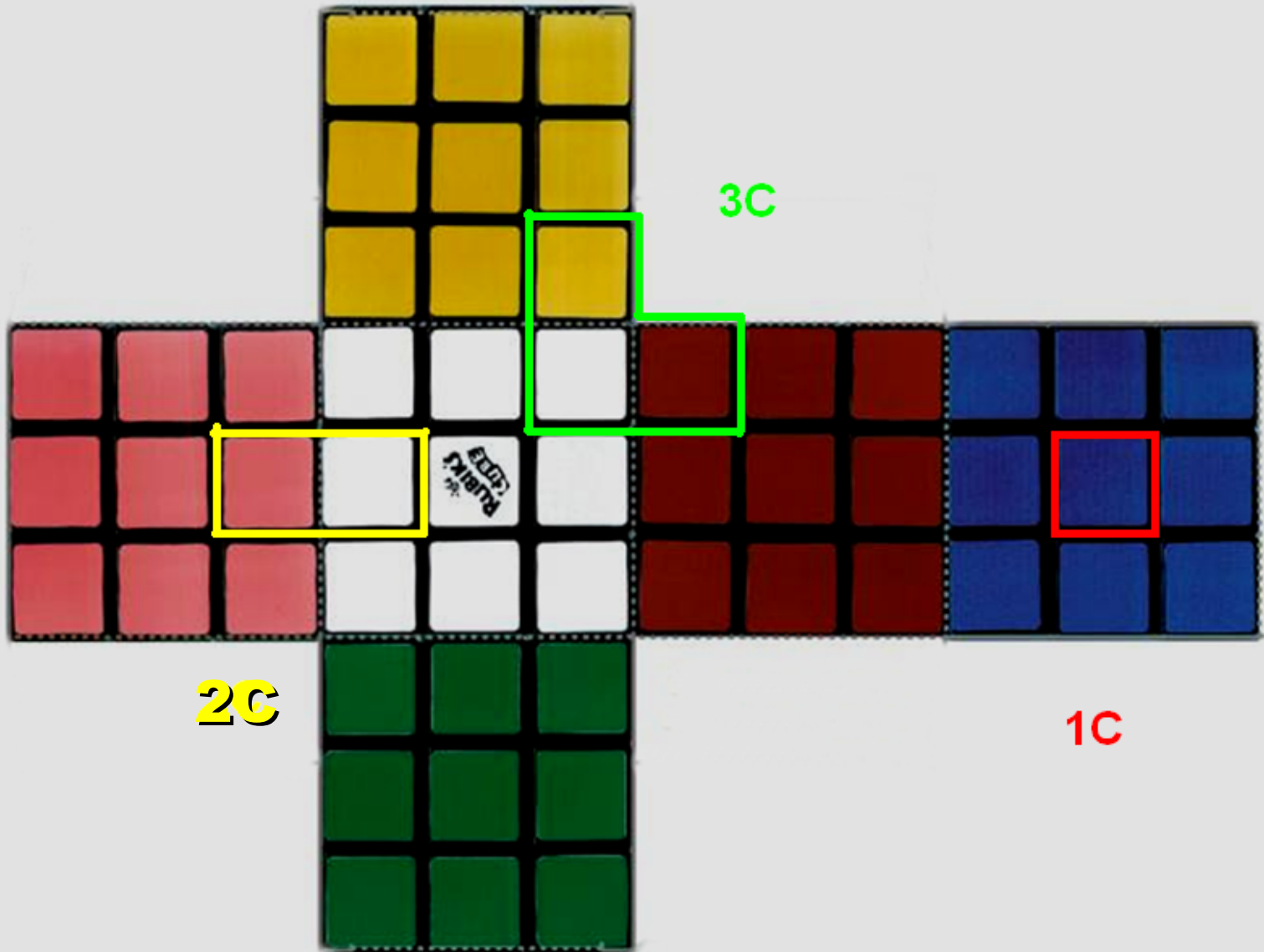
**Remigiusz Durka**

# Cube vs. Hypercube



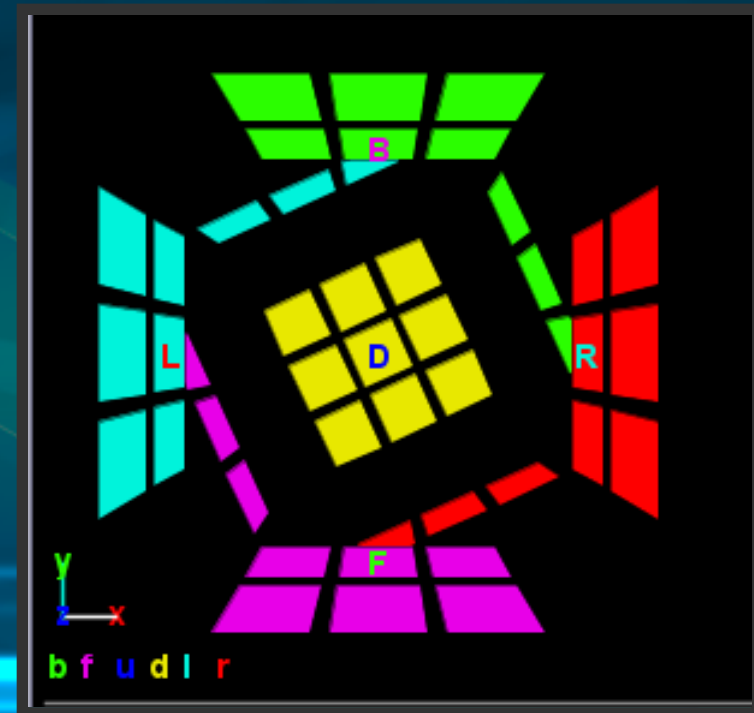
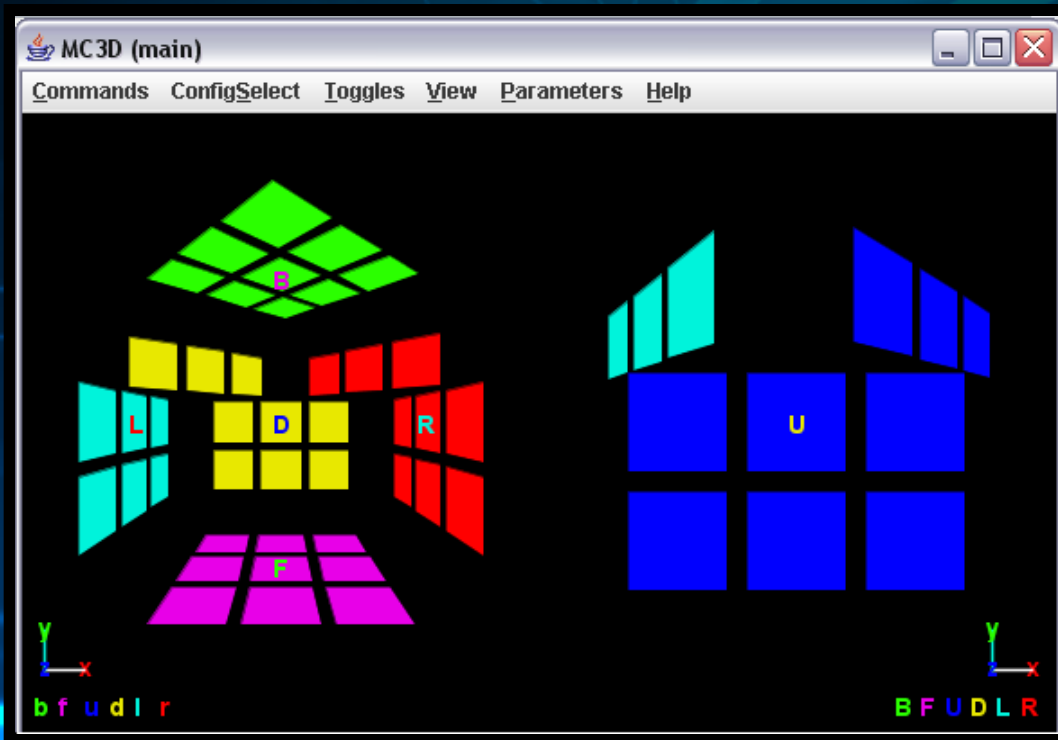
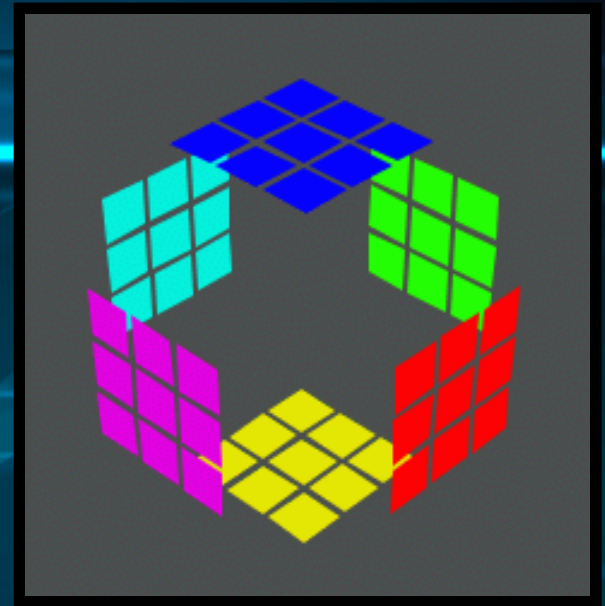
# Siatka a kostka





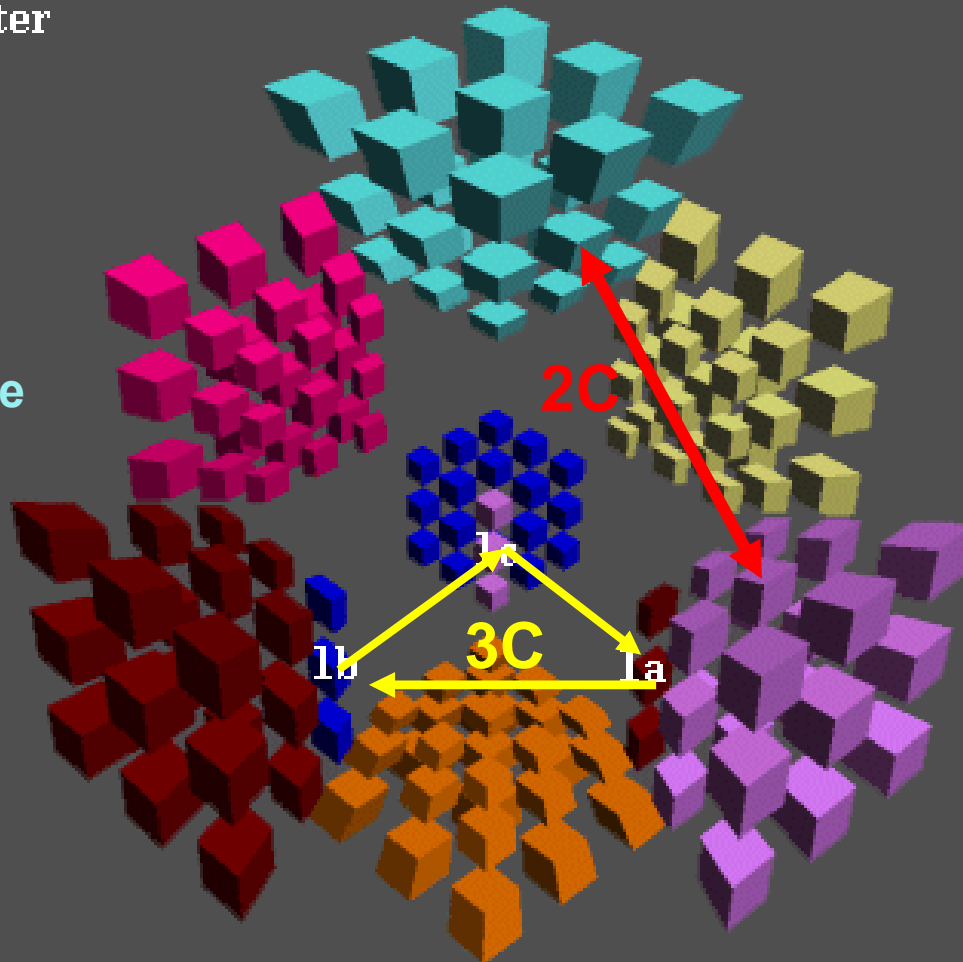
# MC3D

- David Vanderschel wrote MC3D puzzle largely as an educational tool for explaining these concepts by dimensional analogy.



# Klocki

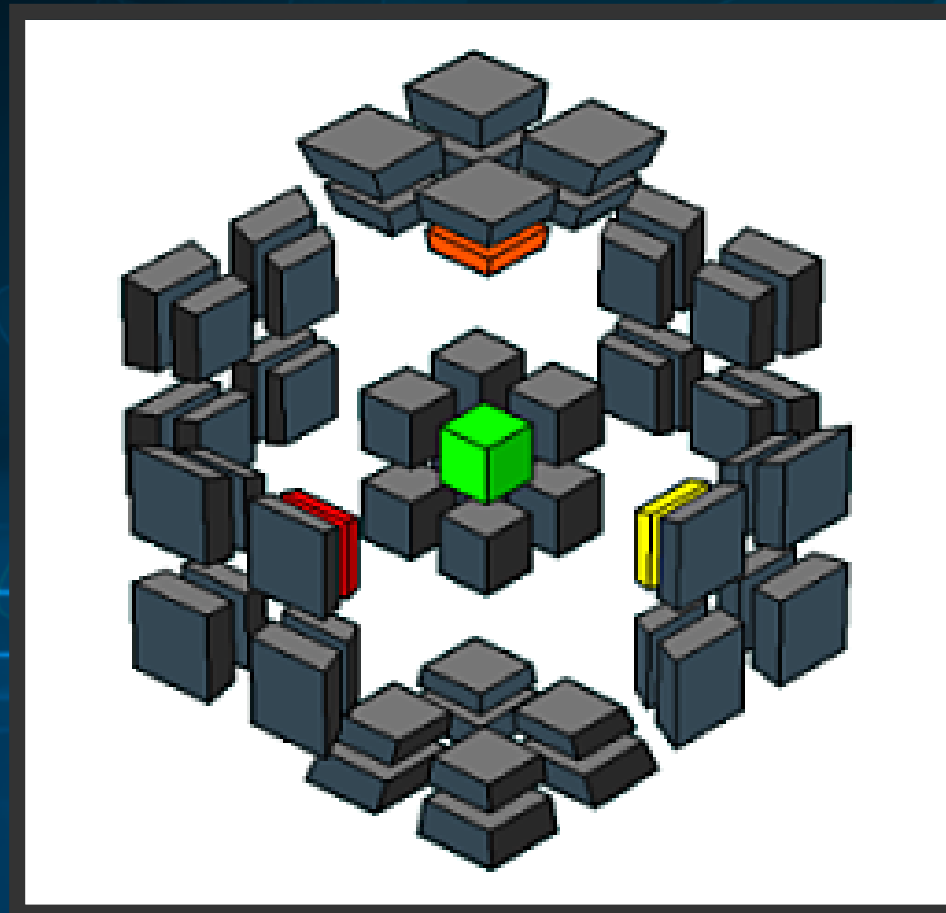
After



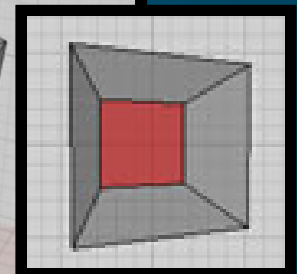
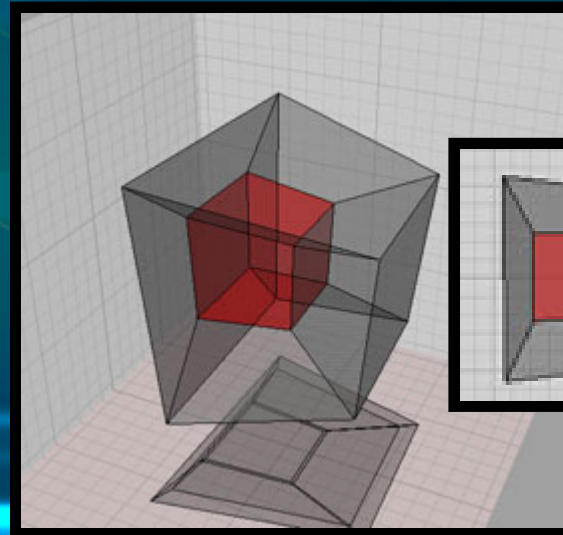
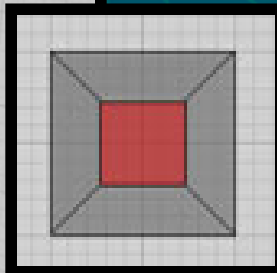
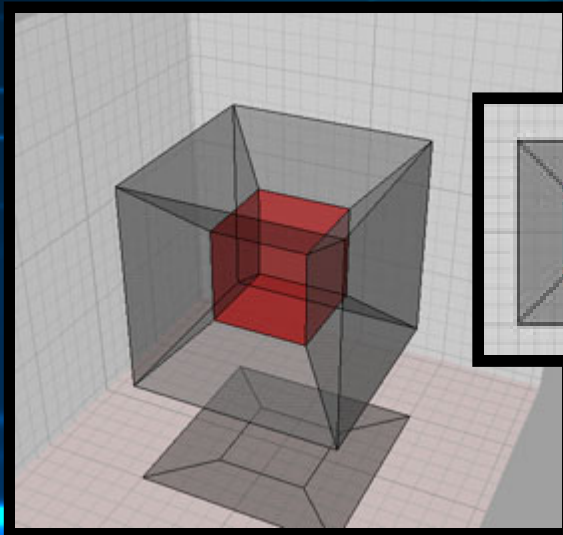
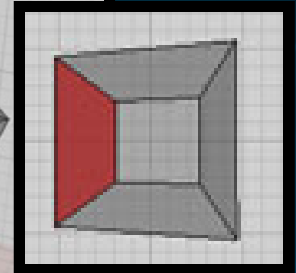
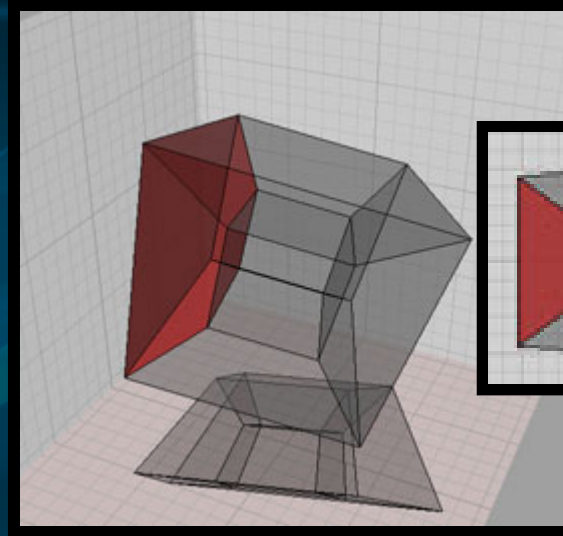
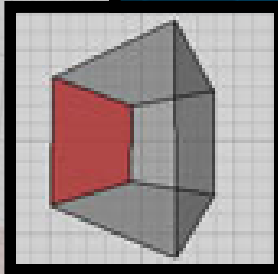
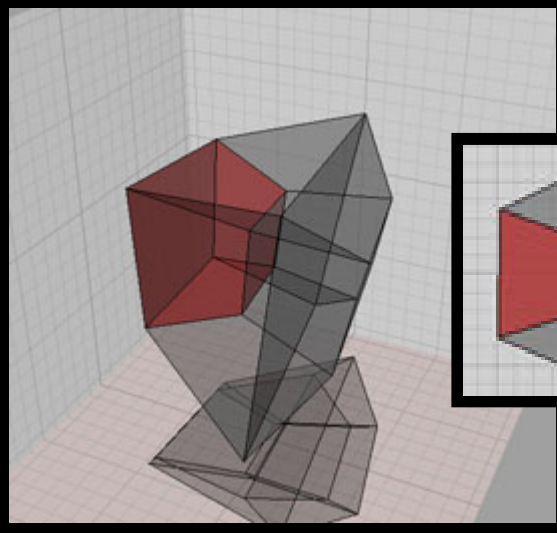
- 1C - centra
- 2C - powierzchniowe
- 3C - krawędziowe
- 4C - rogi



# Rogi (4C)

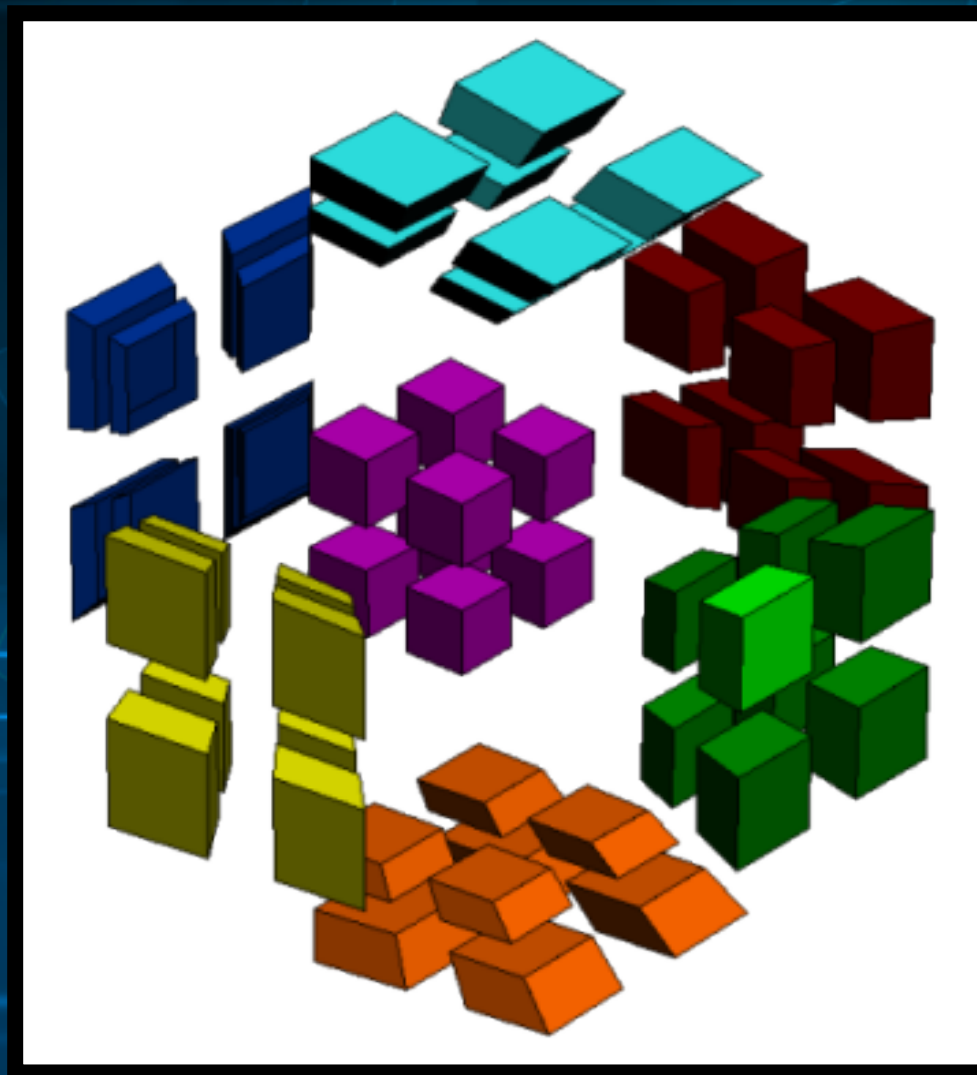


# Jak realizowany jest obrót w 4D

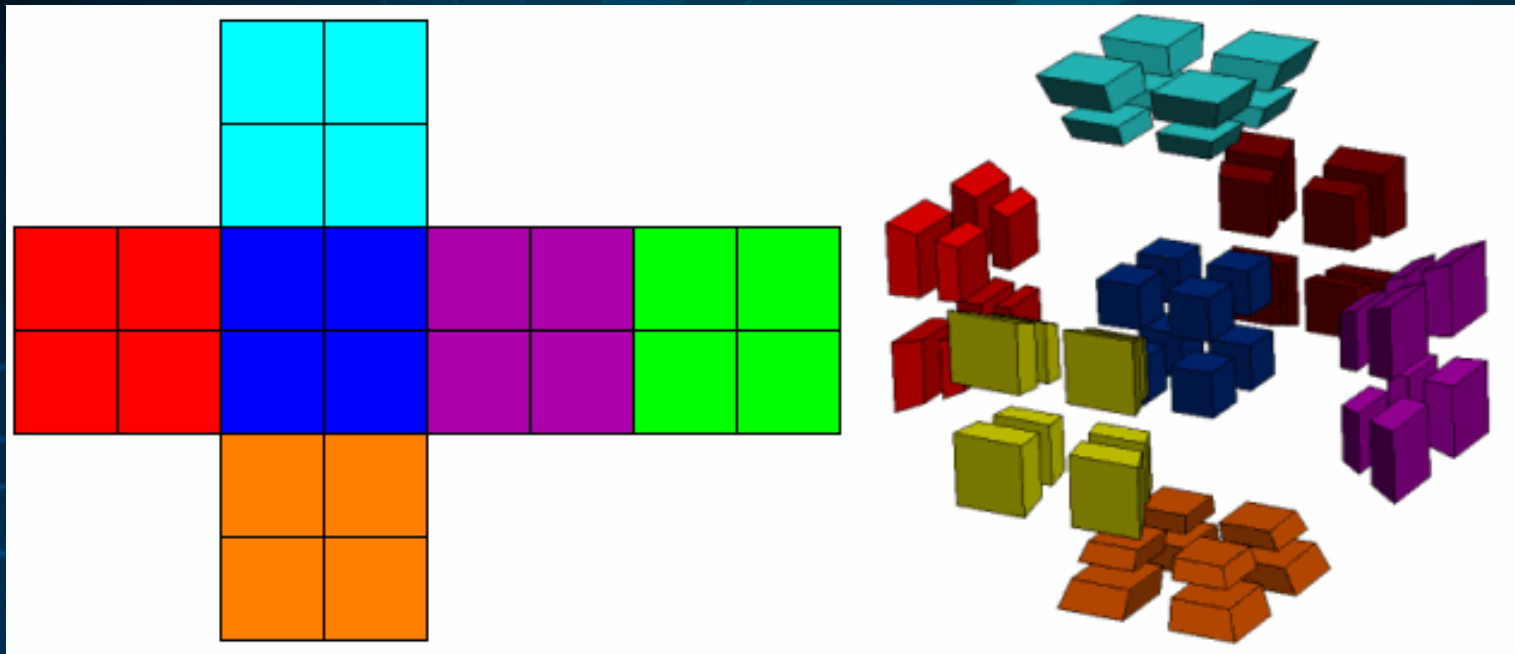




# Obrót w 4D

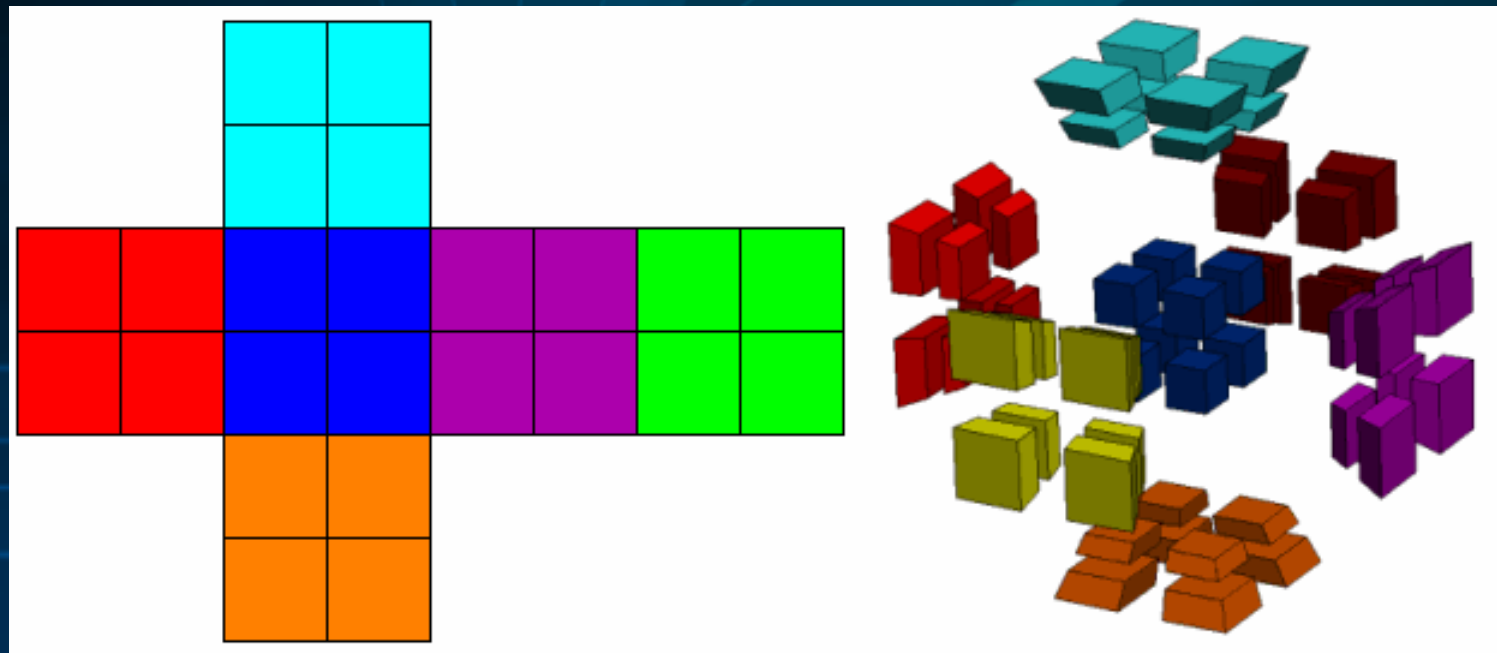


# Twisty – czyli obroty „ścian”



siatka 2x2x2 vs siatka 2x2x2x2

# Twisty – czyli obroty „ścian”

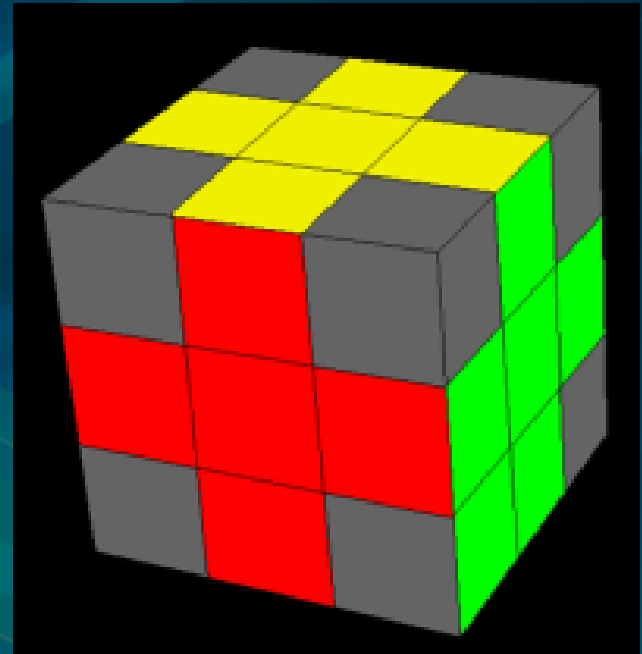


siatka 2x2x2 vs siatka 2x2x2x2

(drugie starcie)

# Rozwiązanie Roice'a

- Bazuje na metodzie z kostki 3D, w której układa się najpierw wszystkie klocki krawędziowe, przechodząc potem do rogów.



# 3D versus 4D

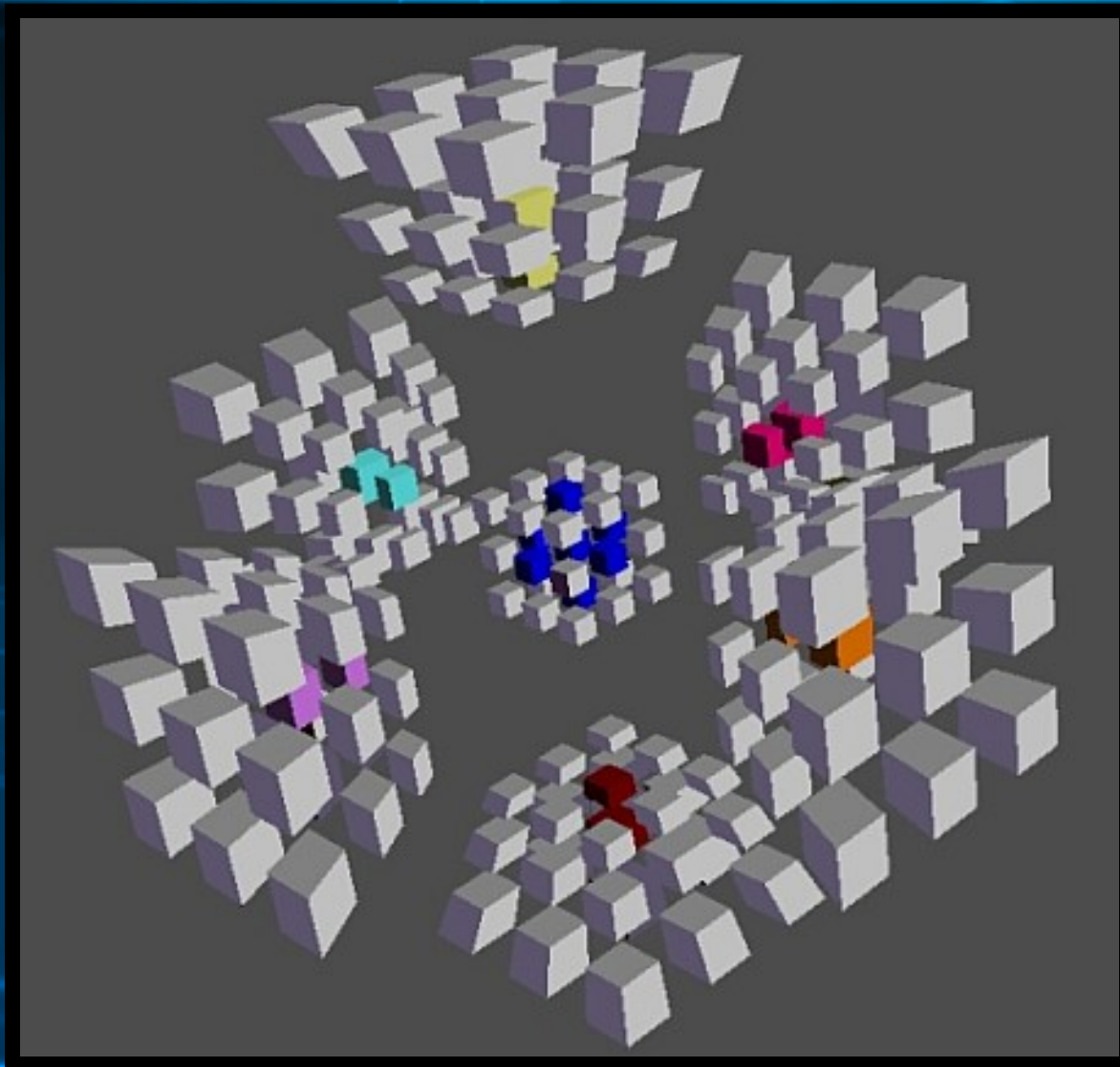
**Kostka 3D ma klocki:**

- 6 jednokolorowych “centralnych”
- 12 dwukolorowych “krawędziowych”
- 8 trójkolorowych “narożnych”

• **Kostka 4D ma klocki:**

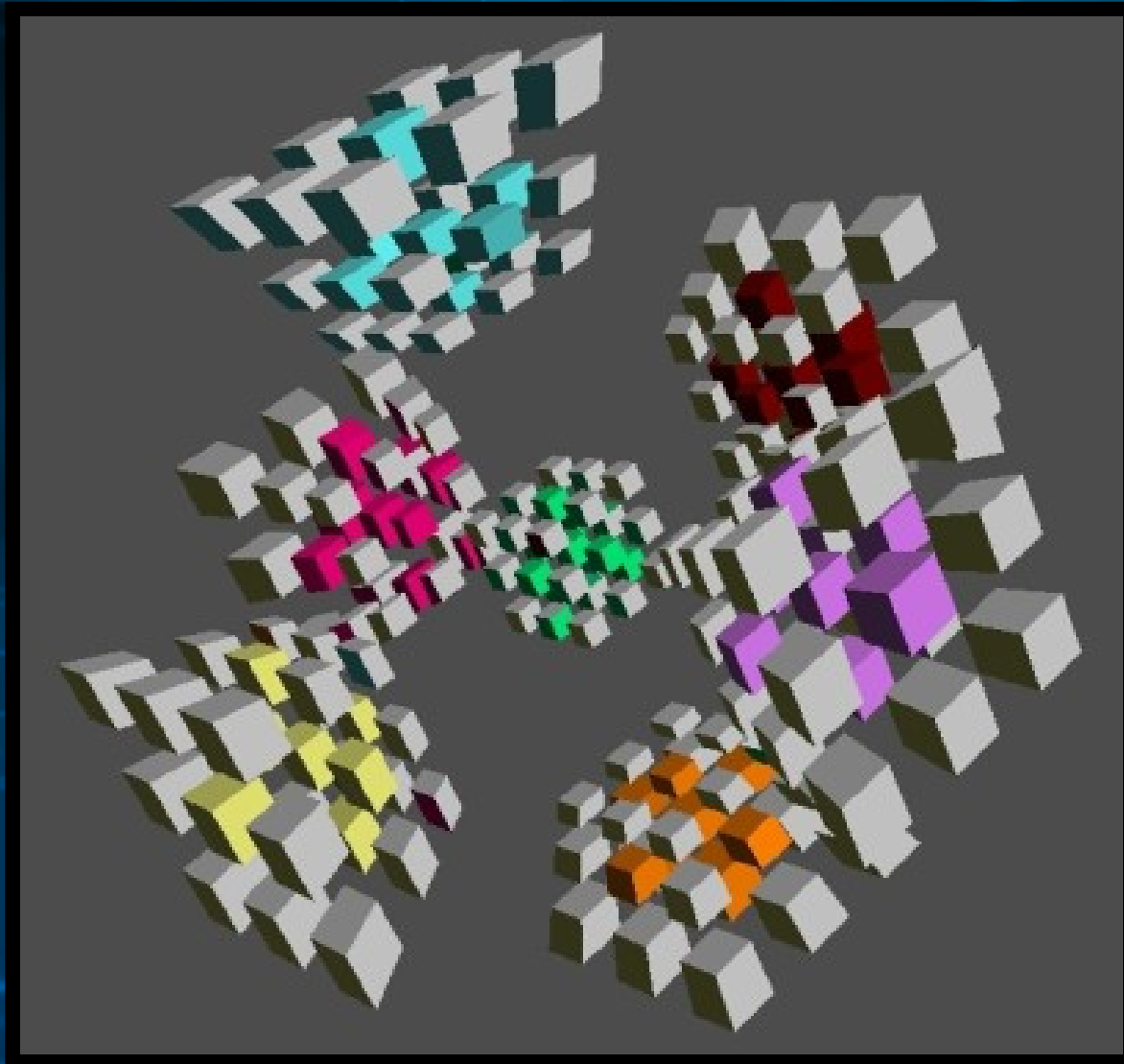
- 8 jednokolorowych “centralnych”
- 24 dwukolorowych “ściennych”
- 32 trójkolorowych “krawędziowych”
- 16 czterokolorowych “narożnych”

# Etap I – krzyż w centrum

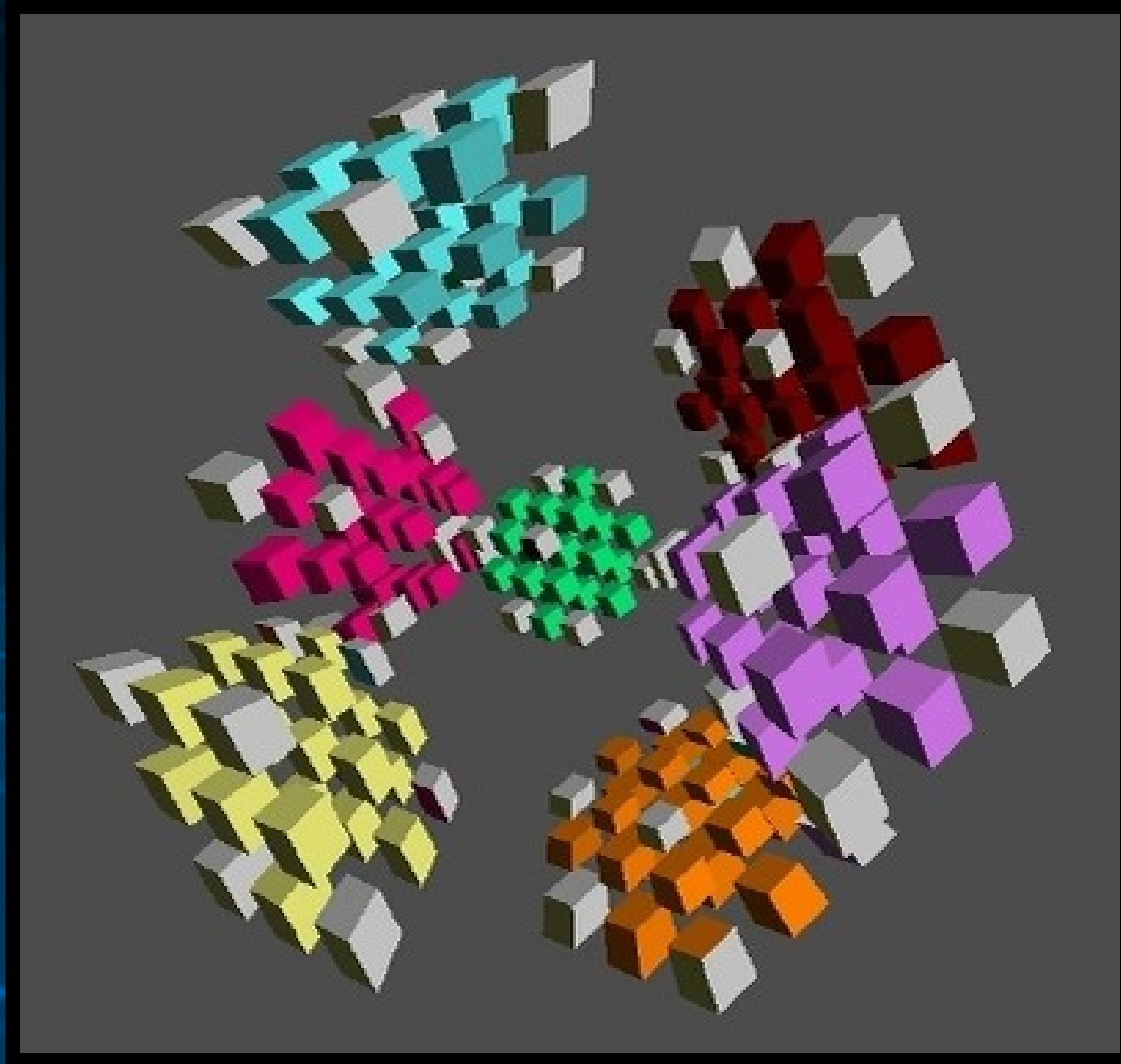




## Etap II – krzyże w centrach



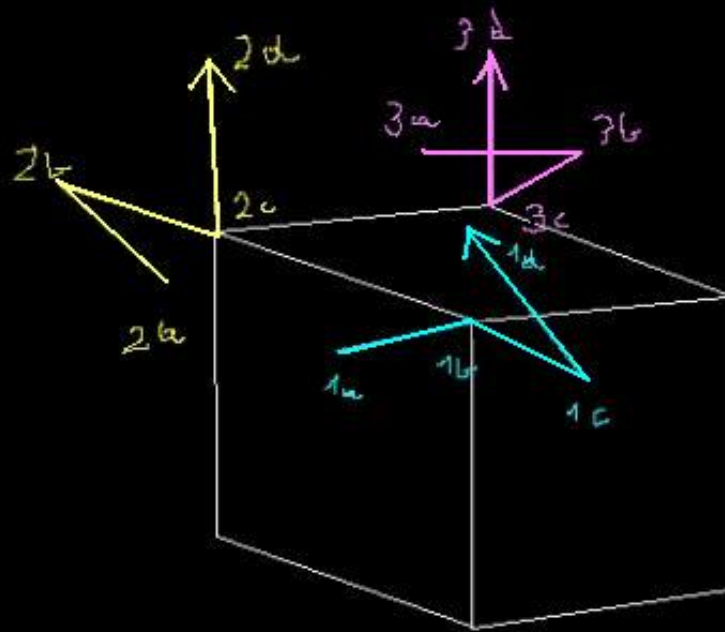
## Etap III – krzyże na powierzchniach



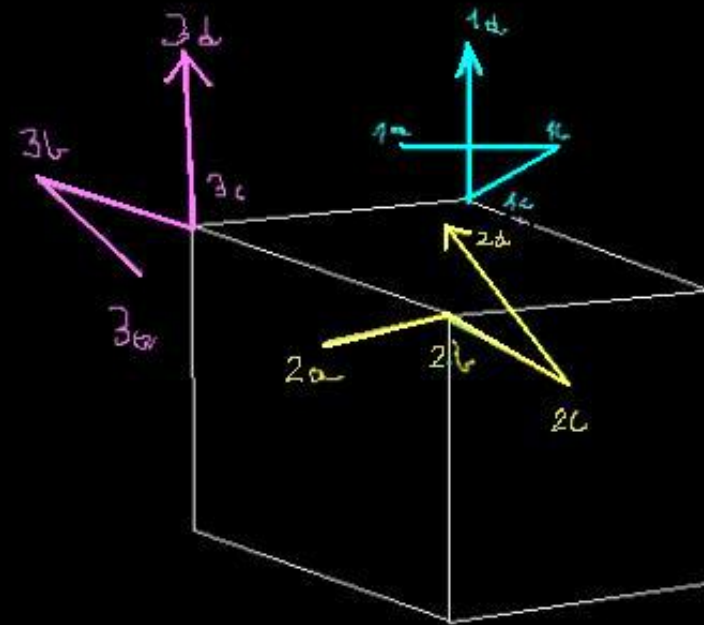
Teraz już tylko rogi...

# Jak ogarnąć tańczące $3 \times 4 = 12$ sześcianików?

Before



After



First 4 Colored Sequence