

The Combinatorial Diversity of the 24 order-2 Polyocts

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The Ochominoes Set

Ochominoes are an original set of reversible polyform tiles: *polyocts*, specifically its subset of diocts. Diocts consist of pairs of octagons edge-joined to form a kind of domino, with from 0 to 6 squares attached on their diagonal edges in all possible combinations. This set was created by Dan Klarskov of Denmark, developed with Kate Jones in 2016-2017, and produced in 2018 by Kadon Enterprises, Inc. Further research has continued to the present (2020), with constantly new and surprising discoveries of symmetries, color patterns, and combinatorial interactions. Named and styled by Kate Jones, the set is color-coded for the number of squares each piece has. The 0 and 6 share a color. Each shape is distinct (Figure 1). Many even have nicknames, like Teddybear, Cat, Duck, Penguin, Heart, etc. We here illustrate the newest discoveries that show the aesthetics of such mathematical sets: math as art.

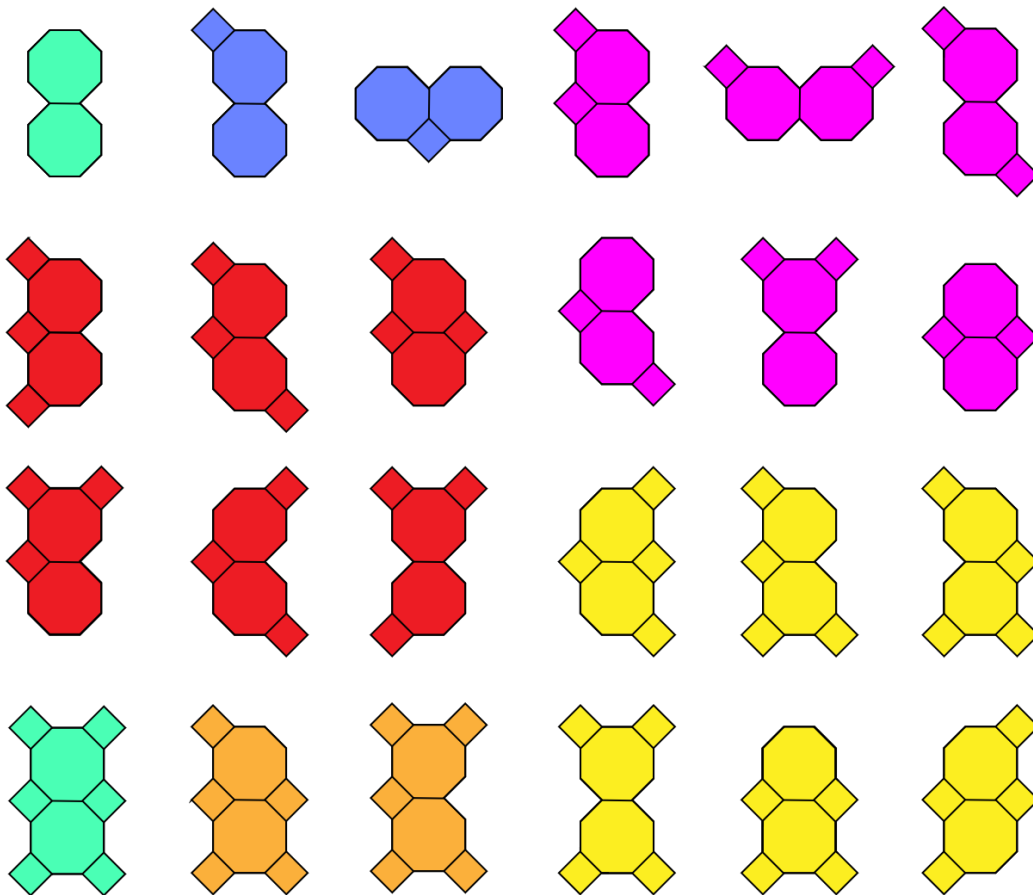


Figure 1: The 24 Ochominoes tiles, consisting of 48 octagons and 72 squares. Note that 12 tiles are self-symmetrical, and the other 12 are non-symmetrical.

Symmetries

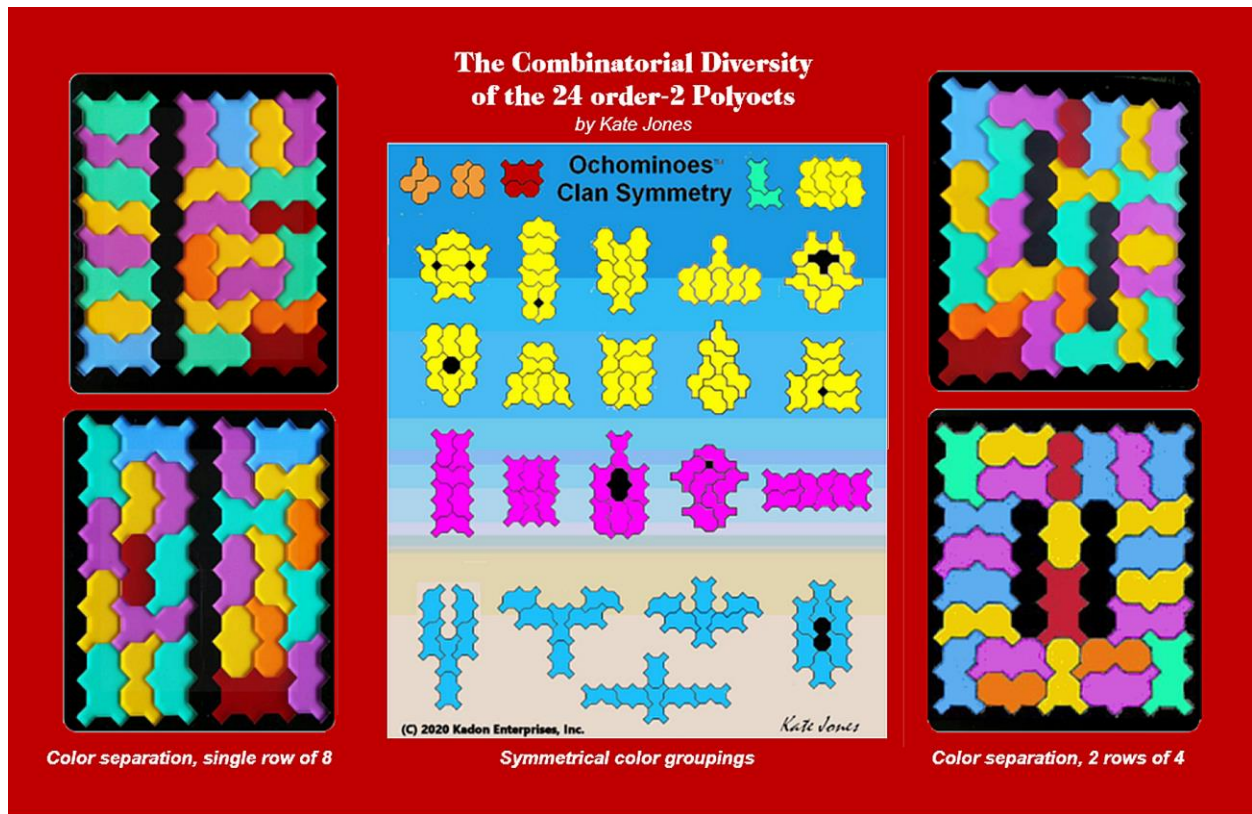


Figure 2: Miniature view of the large poster art prepared for JMM 2021 art exhibition. Left and right columns: color separation solutions with symmetrically placed filler rows. The 8 filler spaces can have many symmetrical configurations, even 8 singles. Center: “Clan” symmetry of each color group.

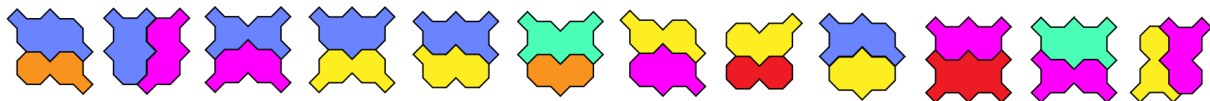


Figure 3: 12 symmetrical pairs with no pair consisting of two of the same color. Rare!



Figure 4: Archimedes award for best logical puzzle at Kastellorizo Greek puzzle competition, 2018

References

- www.gamepuzzles.com
- www.gamepuzzles.com/ochom.htm
- www.gamepuzzles.com/megistian2.htm

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