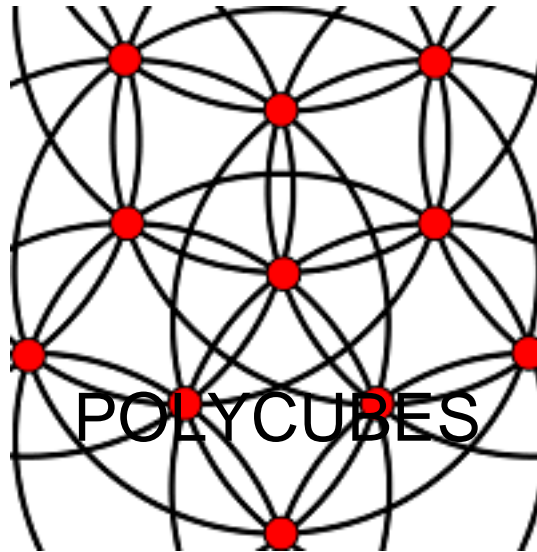


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Content :

Polycubes are polyforms made of cubes of the same size joined face to face. Various algebraical, geometrical, topological, combinatorial and symmetrical properties of polycubes may be studied.

The boundary of a non-singular polycube is a surface (every boundary point has a neighborhood homeomorphic to a disc). We focus on the morphology of such polycubes:

1) We present an algebraic description of such a boundary (an atlas with labeled edges) and show how various »global informations« about the non-singular polycube P (e.g. the number of its cubes)

may be obtained from this »local information« (about the shape of its boundary). The same method (motivated by the ideas and techniques of H. Abelson and A. di Sessa from their book *Turtle Geometry*, 1986) may be applied to other 2D and 3D-polyforms made of regular polygons or Platonic solids.

2) A classification of different types of boundary vertices and boundary faces of non-singular polycubes is presented, from which the basic relations between various parameters of polycubes are easily obtained.

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