

---

Subject: Yet two other D16s

Posted by [Magic](#) on Mon, 22 Oct 2012 21:53:21 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Hi there,

In my attempts to make a D16, I found a D16 with a tetrahedral symmetry. Basically, take a tetrahedron (triangular pyramid), put it inside a sphere and then replace each vertex by a group of 3 circular faces, and keep one circular face where the tetrahedron had its own faces ( $3 \times 4 + 4 = 16$ ).

Another way to construct is to take a truncated tetrahedron (4 triangular faces and 4 hexagonal faces) and then put a face for each vertex but also at the center of each hexagons.

But as you can see the faces that are at the center of the hexagons do not touch the other faces. They are what AleaKybos call "rattlers". In order to maximize the radius of the faces, you can turn a little bit each group of 3 faces corresponding to one triangle of the truncated tetrahedron, say, counter-clockwise. In this way you get some extra space to make all the faces grow a little bit. Repeat the process until you touch the (former) rattler. It is a similar operation that allows to go from the D24 to the snub-D24. That why I call this new D16 the snub-D16 with Tetrahedral symmetry.

In this image I colored the different groups of faces to better understand the process (the one nearly grey is actually orange, and the one nearly black is actually blue, sorry for the poor rendering).

The gain on the separation (that is the angle at its vertex of the cone that goes from the center of the sphere to one circular face) seems low, but actually this is a big improvement: we go from  $50.48^\circ$  to  $51.92^\circ$

Note that none of these dice would have number on their face, so they cannot compete for the D16 Contest...

### File Attachments

---

1) [D16TetraAllCol.jpg](#), downloaded 343 times

---