

MEGAMENGER

Overview: level-2 Menger sponge

The **level-2 Menger sponge** is the second iteration of the three-dimensional Menger fractal. It is made of 20 level-1 sponges arranged in the shape of a cube with holes through the middle in each direction. When building it out of business cards we need to panel some of the faces to strengthen the structure - the number of panels depends on how you choose to construct your level-2 sponge.

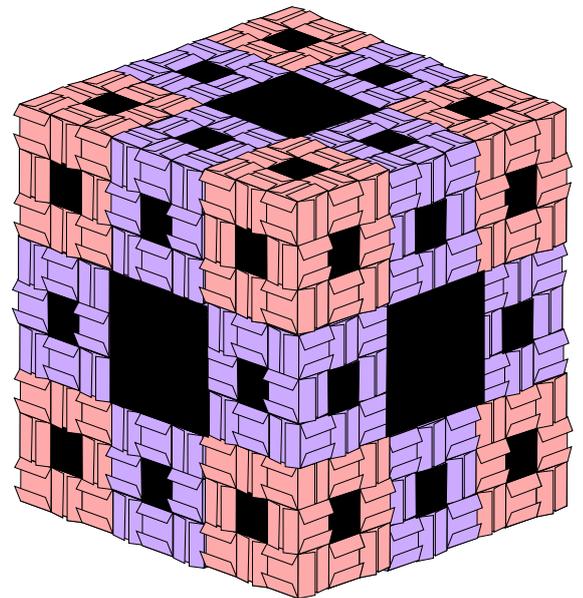
Number of level-1 sponges in each level-2: 20

Number of cubes in each level-2 sponge: 400

Total number of business cards: 2400

Number of cards needed to panel the outside, if built from already pre-clad level-1 sponges:
384

Number of cards needed to panel only the larger internal faces so it can be joined to other level-2 sponges: 192



We have four ingenious ways to build the level-2 Menger sponge:

- 1. Cube-by-cube construction** - as in the case of the level-1 sponge, you link the cubes one at a time, panelling the appropriate internal faces as you go along.
- 2. Layer-by-layer construction** - this is analogous to the construction of a level-1 sponge, except you're joining together level-1 sponges instead of cubes.
- 3. Mega tripod method** - a scaled-up version of the tripod method for the level-1 sponges. If you're thinking of splitting the work between groups of people, building a tripod of level-1 sponges is a task you could give to a more advanced group.
- 4. Tripod method** - this is the most intricate method and involves building several types of tripod modules and joining them together. The advantage of this technique is that it results in easier joining at the final assembly stage.

We have made instruction sheets for techniques 3 & 4. For the other construction methods, you can use the level-1 sheets but with internally panelled level-1 sponges in place of cubes. Feel free to use whichever technique you prefer!

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