Subject: Polyhedra Building Tiles
Posted by Robotguy on Sun, 15 May 2011 05:43:55 GMT
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Well, it took a bit longer than expected, but it was worth the wait!

Here's 3 of the 4 tiles I ordered in TD (I have misplaced the triangle tile already):

The detail is OK, but I think the tiny nubs intended to lock the hinges were too small for the resolution of the TD. I may make a few modifications, make the nubs and dimples larger, add some clearance for the pins, and reprint in FUD.

I used these master parts to make two molds from "Platinum Silicone":

I mix up only 40 ml of urethane to fill both molds. Here's a few squares and triangles waiting for some cleanup sanding right out of the mold:

And last but certainly not least, here's my first polyhedron, with 12 pentagons and 20 hexagons, a truncated icosahedron:

File Attachments

1) actual_tiles.jpg, downloaded 82 times

Subject: Re: Polyhedra Tiles
Posted by Magic on Sun, 15 May 2011 07:07:16 GMT
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Very very impressive. I was waiting for the result, and I am not disappointed at all.
Congrats.
Now I am curious to see what kind of puzzles you plan to do from this great material...

Subject: Re: Polyhedra Tiles
Posted by Robotguy on Sun, 15 May 2011 16:16:26 GMT
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Thanks! The end goal is 3D crossword puzzles on the surface of a polyhedron, like this:

You can see all 12 words in this video

The idea is that you would get a set of tiles and a list of crossword clues, then would have to build the crossword puzzle as you solved the clues. The really difficult puzzles may not even reveal location of the words, e.g. word 1 may not be anywhere near word 2.

I have 142 sets of 12 5-letter words that mesh on the surface of a truncated icosahedron. I plan to use a stencil cutter to make letter/number stickers to fit in the inset on each tile. Eventually I plan to have word sets for most of the Archimedean solids. Some may not work out as well, for instance the truncated tetrahedron would only have 4 different 3-letter words.

I think I am going to build a rhombicosidodecahedron, so I'll need to cast the molds 5 more times to get to the 30 squares I need.

Subject: Re: Polyhedra Tiles
Posted by Magic on Sun, 15 May 2011 16:45:09 GMT
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Very interesting!

I did something similar (but different since the letters were already there but mixed) for an octahedron: see the 4-letters words D6. I initially wanted to do more of them with other regular polyhedra, but I did not have the opportunity to do so...

I also do this kind of game - but with numbers - when I number my dice. For instance on this D18 the sum of all the numbers around a round area is 57.
I plan to make the Shapeways community play with me to this game with me very soon...

So your tiles open a lot of possibilities (letters but perhaps also numbers). I hope you will have fun trying the other shapes!

Subject: Re: Polyhedra Tiles
Posted by Robotguy on Mon, 16 May 2011 19:28:04 GMT
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Magic wrote on Sun, 15 May 2011 16:45I did something similar (but different since the letters

were already there but mixed) for an octahedron: see the 4-letters words D6.

That's a really neat idea!

I spent quite a while this weekend casting parts and sanding (both the tiles and my fingertips. Whoops!). Here's a moderately lousy pic of the results (I didn't have my good camera available):

Here we have a truncated icosahedron, rhombicosidodecahedron, dodecahedron, icosahedron and a truncated tetrahedron.

Subject: Re: Polyhedra Building Tiles
Posted by lensman on Tue, 17 May 2011 17:07:50 GMT
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Neat. RobotGuy what did you make a mould and cast with?

Any tips on that process?

Glenn

Subject: Re: Polyhedra Building Tiles
Posted by Robotguy on Tue, 17 May 2011 19:50:07 GMT
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lensman wrote on Tue, 17 May 2011 17:07RobotGuy what did you make a mould and cast with?

Any tips on that process?

I made the molds with "Platinum Silicone" from Tap Plastics, and just followed their example video for making a mold box, except I used Legos to build the walls.

I cast the parts using "Quik-Cast." It has a de-mold time of around 15 minutes, but at that rate I had to let them finish curing on a flat surface because they were still rather soft.

Subject: Re: Polyhedra Building Tiles
Posted by lensman on Tue, 17 May 2011 22:27:44 GMT
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Excellent, thanks for the info.

Glenn

Subject: Re: Polyhedra Building Tiles
Posted by Robotguy on Tue, 17 May 2011 22:39:46 GMT
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lensman wrote on Tue, 17 May 2011 22:27Excellent, thanks for the info.

No problem.

Just as a data point, the resolution is high enough that I have been able to reproduce fingerprints on a smooth master using this type of silicone mold process. That means I can clean a piece of smooth steel, make a fingerprint on it, use it to make a silicone mold and then cast some urethane parts with fingerprints on them!