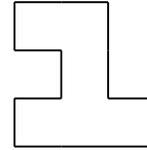


10 x 1 in a cube

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For G4GX I designed a puzzle that honors the theme (10) of this gathering for Gardner. The puzzle consists of 10 pieces shaped like the digit 1. This shape tiles the plane; thus it can be cut efficiently from planar material. Written together like 1111111111 gives the representation of the number 10 in unary.

The pieces can be assembled into a cube in 4 different ways, shown below. Each row of 4x4 squares in the image below represents the four layers of a solution. Please try to solve the puzzle before looking at the solutions. Although the puzzle is not trivial; it is certainly possible to solve it manually.

Solution 1	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>6</td><td>9</td><td>9</td><td>9</td></tr> <tr><td>X</td><td>X</td><td>9</td><td>8</td></tr> <tr><td>6</td><td>X</td><td>9</td><td>9</td></tr> <tr><td>X</td><td>X</td><td>X</td><td>8</td></tr> </table>	6	9	9	9	X	X	9	8	6	X	9	9	X	X	X	8	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>6</td><td>3</td><td>5</td><td>3</td></tr> <tr><td>6</td><td></td><td>5</td><td>8</td></tr> <tr><td>6</td><td></td><td>5</td><td>8</td></tr> <tr><td>4</td><td>2</td><td>2</td><td>8</td></tr> </table>	6	3	5	3	6		5	8	6		5	8	4	2	2	8	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>6</td><td>3</td><td>3</td><td>3</td></tr> <tr><td>4</td><td>7</td><td>5</td><td>7</td></tr> <tr><td>4</td><td>7</td><td>7</td><td>7</td></tr> <tr><td>4</td><td>7</td><td>2</td><td>8</td></tr> </table>	6	3	3	3	4	7	5	7	4	7	7	7	4	7	2	8	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>1</td><td>5</td><td>3</td></tr> <tr><td>4</td><td>1</td><td>5</td><td></td></tr> <tr><td>1</td><td>1</td><td>1</td><td></td></tr> <tr><td>4</td><td>2</td><td>2</td><td>2</td></tr> </table>	1	1	5	3	4	1	5		1	1	1		4	2	2	2
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The pieces were laser-cut from 5mm sand-blasted blue acrylic (PMMA). This material has the problem that the thickness can vary quite a bit. The *unit size* of the pieces was adjusted for the actual thickness of the material. The pieces in each set use, of course, the same *unit size*. If you combine pieces from different sets you may encounter problems.

This puzzle was designed with BurrTools; see <http://burrtools.sourceforge.net/>