

**This is a traditional japanese puzzle box. But I prepared this document. All the copyrights of this documents belongs to me.**

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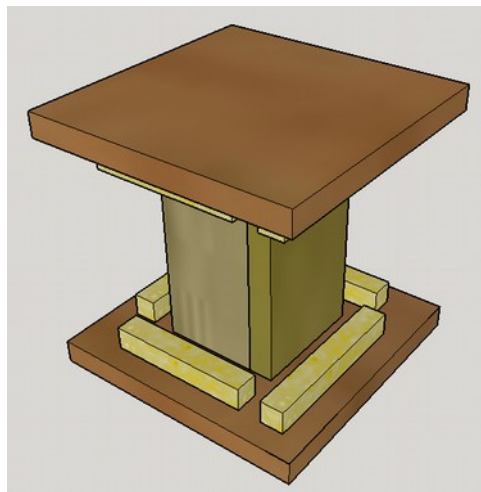
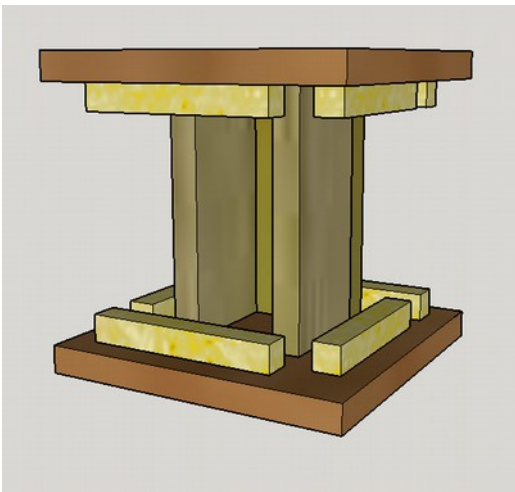
## Japanese puzzle box



This is my simple Japanese puzzle box project. Japanese puzzle boxes aren't beginner projects. All of them are difficult to make because they require a precise work and they have a lot of parts. This box is one of the most simple Japanese puzzle box. Here I want explain first how a Japanese puzzle box work. Understanding how it works will make your work easier.

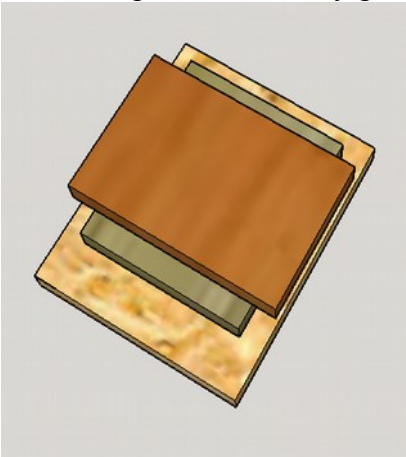
This puzzle box has four removable sliding panel and a box frame. Box frame contains box compartment and top, bottom pieces. You can open or close the box by moving each panel one by one in turn.

This is box frame from two different view,



In the center of the frame you can see box compartment. Top and bottom pieces are glued and fixed to this center piece. There are also eight rail piece fixed to this frame. Four rails fixed to top piece and other four fixed to bottom piece. Four side panels slide on this rails.

Each side panel is made by gluing and fixing three piece,



Now I will explain how to open (or close) this box. For showing inside of the box, I hide box frame, When you try to open this box, only green panel can move,



According to computer analysis this box open in 10 moves, but as you can see from photo with 8<sup>th</sup> move this box became open. You will need move other panels for reaching box compartment but I think after 8<sup>th</sup> move everything is clear.

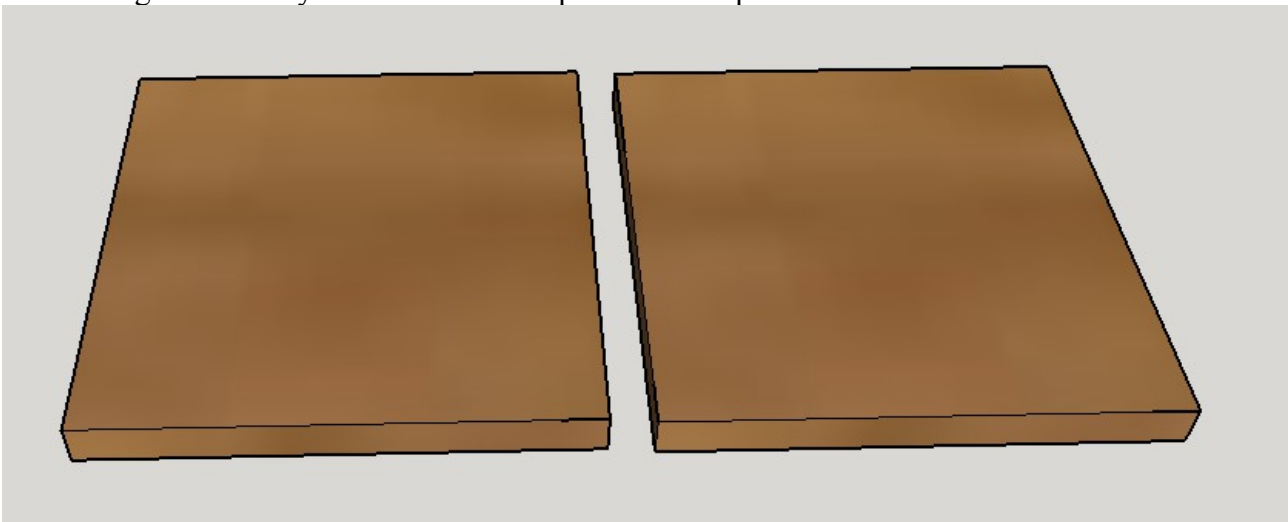
## How you can make your own box

Here I will explain how I made my cube shaped box. My box dimensions are  $12T \times 12T \times 12T$ .  $T$  is my material thickness. For this project I used 5 mm mahogany and beech and in this case my box dimensions are 60x60x60 mm.

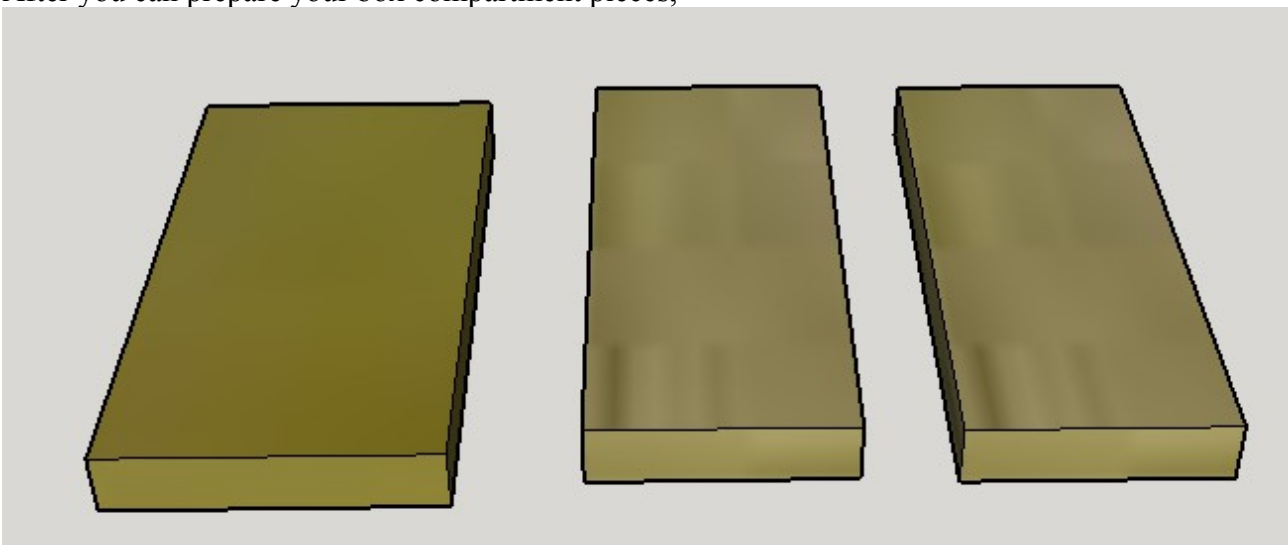
First I made my box frame. Material list for box frame,

Part name	Qty	Dimensions
Top and bottom pieces	2	$12T \times 12T \times T$
Short rails	4	$7T \times T \times T$
Long rails	4	$8T \times T \times T$
Box compartment sides	2	$5T \times 10T \times T$
Box compartment base	1	$6T \times 10T \times T$

For making box frame you can start with top and bottom pieces.

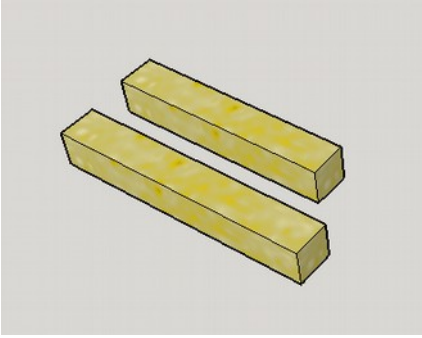


After you can prepare your box compartment pieces,

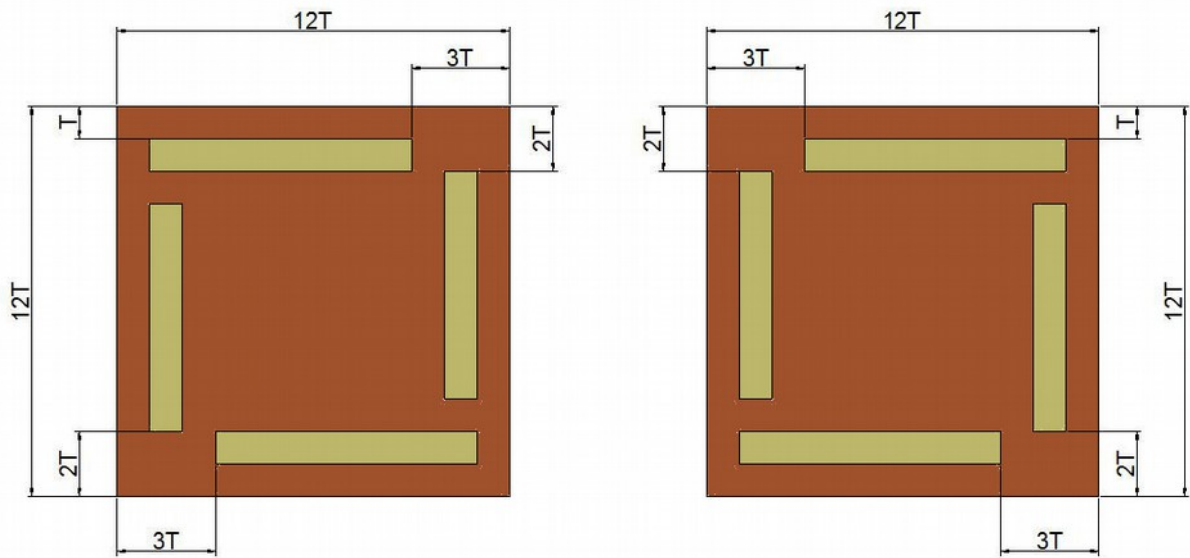


Large piece is the box compartment base,

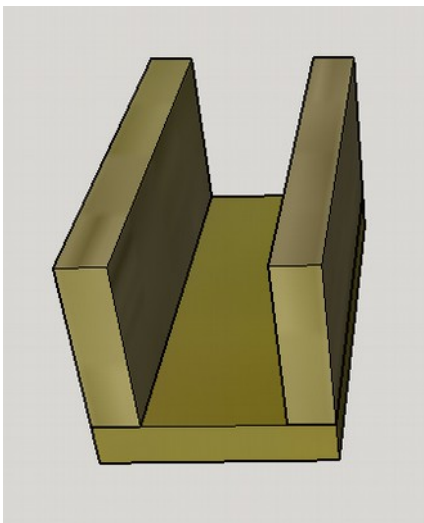
And you will need rails. You need four long and four short,



Now you can glue rails on top and bottom pieces,

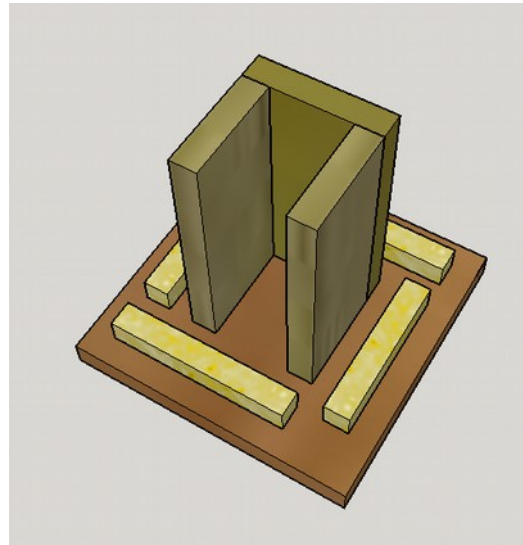
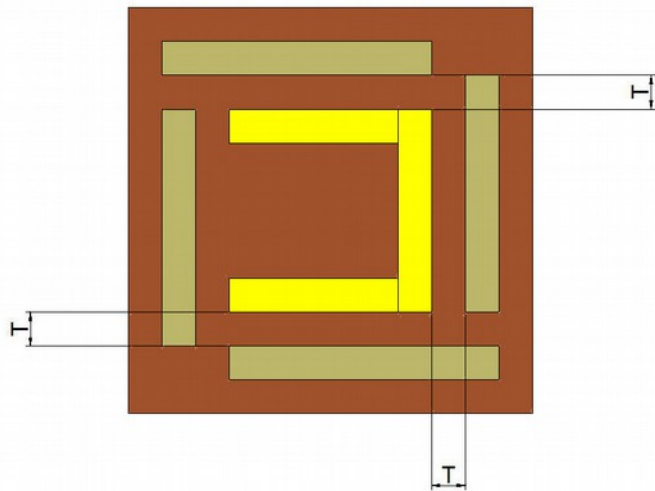


You can see mirror symmetry between top and bottom pieces. Also each piece's short and long rails are symmetric according to piece center. All rails distance to edges is equal to "T". I advise to use one of your box pieces as a guide for gluing rails to top and bottom pieces. Now you can prepare your box compartment,

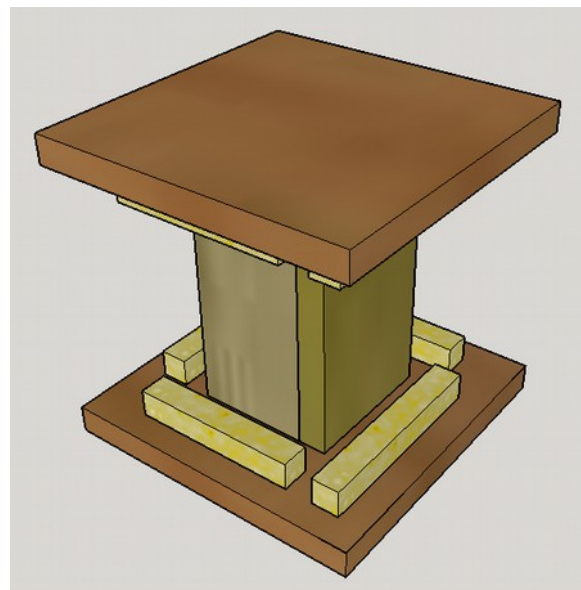
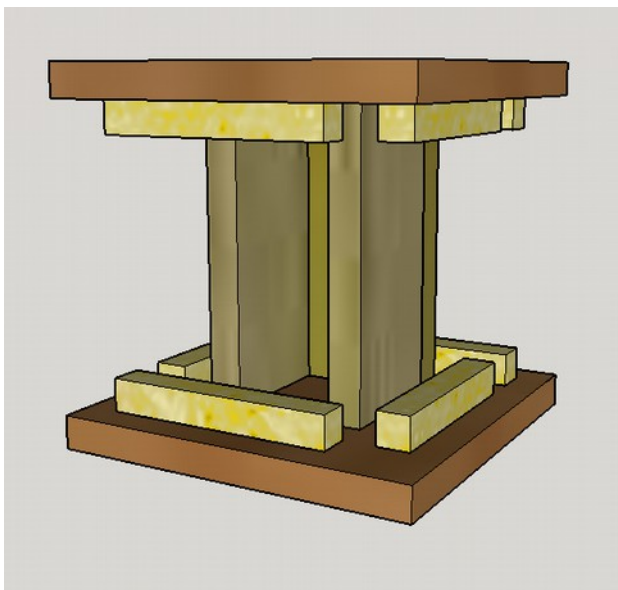


You must glue two side pieces to the edges of base pieces. Edge pieces must be perpendicular to the base. You must check this.

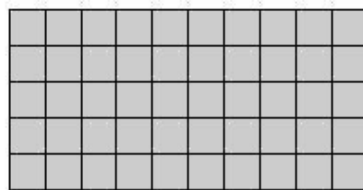
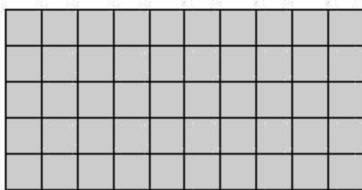
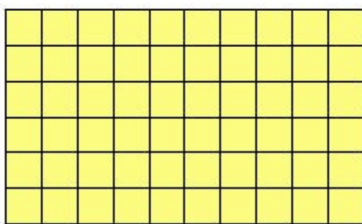
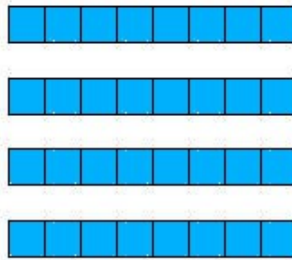
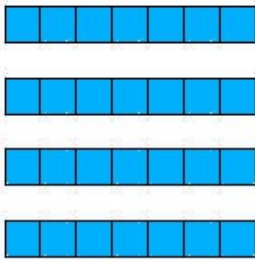
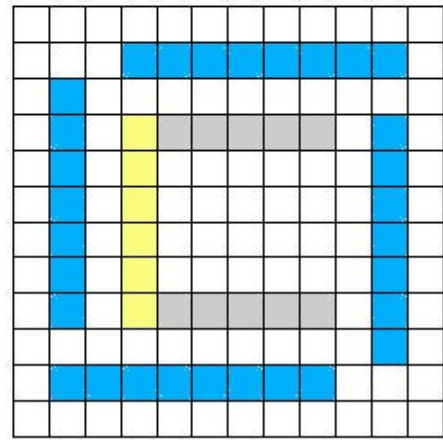
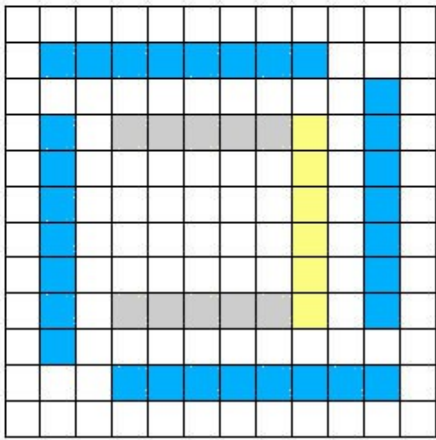
Now you can glue box compartment to the bottom piece according to this drawing,



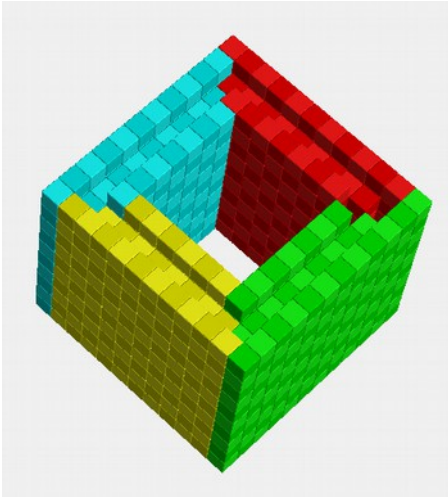
For gluing you can use some small scaraps with “T” thickness. You can put small pieces with “T” thickness to four side of the rails and glue this box compartment to the center. Open side of the “U” shape is turned to short rails side. This is important. Now you can glue top piece and you will obtain your box frame,



All pieces for box frame is here in required numbers. Each square is equal to material thickness "T". You can count and find dimensions. You will glue each colored piece to the area marked with same color.



## Box panels



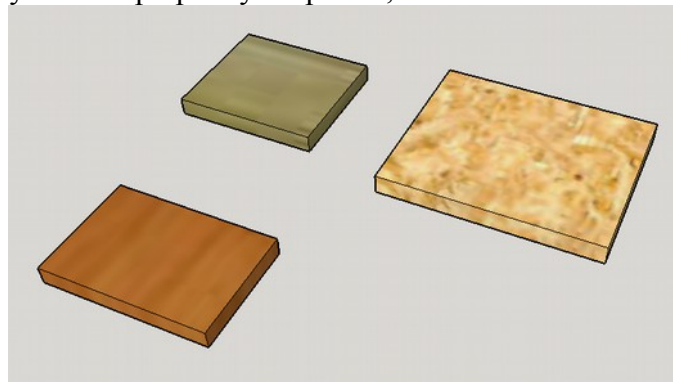
Now I will explain how to make box panels. As you can see from photo our box has four panels and each panel is made of three piece. I will name this pieces as,

Outside piece  
Middle piece  
Inside piece

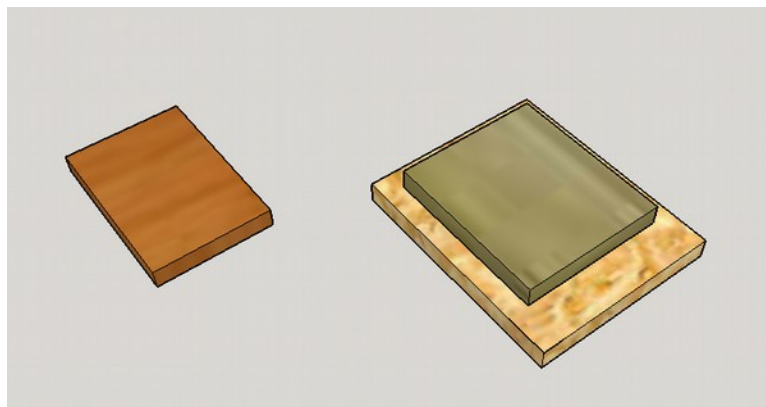
Box Panel dimensions are here,

	<b>Outside pcs</b>	<b>Middle pcs</b>	<b>Inside pcs</b>
<b>Green panel</b>	12T x 10T x T	9T x 8T x T	7T x 10T x T
<b>Red panel</b>	11T x 10T x T	9T x 8T x T	7T x 10T x T
<b>Blue panel</b>	11T x 10T x T	9T x 8T x T	7T x 10T x T
<b>Yellow panel</b>	10T x 10T x T	8T x 8T x T	6T x 10T x T

For making your panel first you must prepare your pieces,



After you must glue center piece to outside piece,

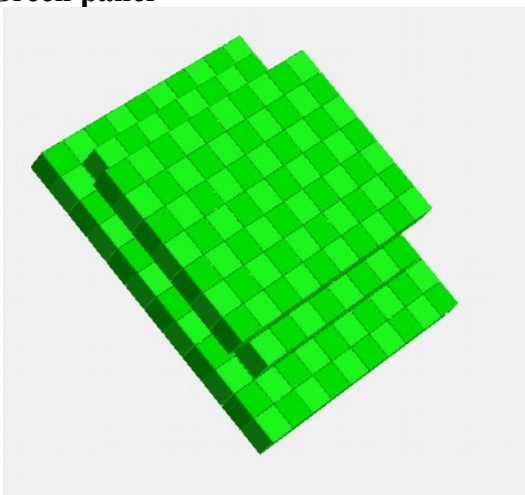




And finally you must glue inside piece to the middle piece,

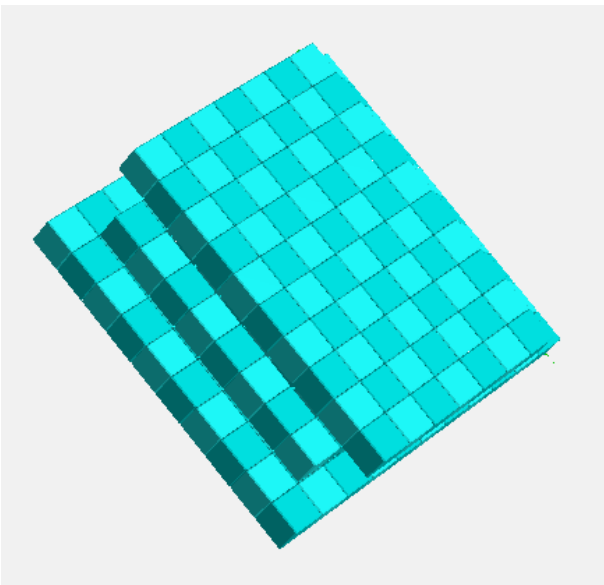
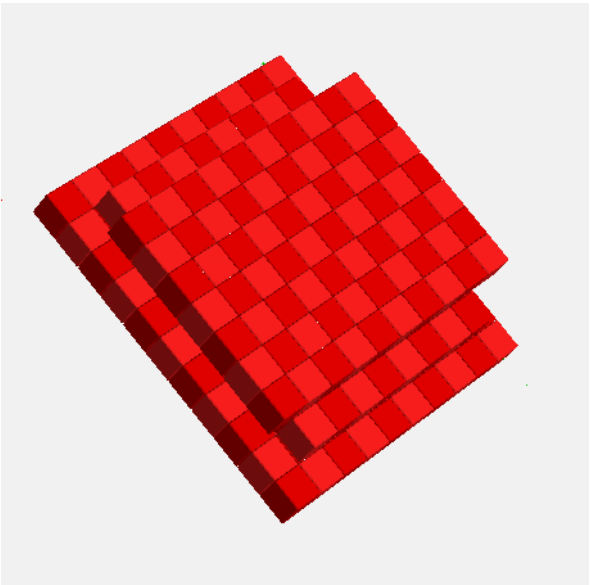


**Green panel**

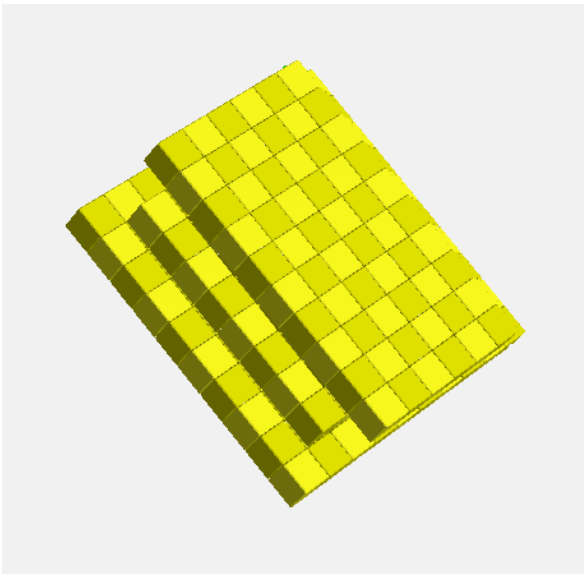


From this picture you can count squares and find how to glue each piece,

**Red panel and blue panel are exactly same, two different view but same piece,**

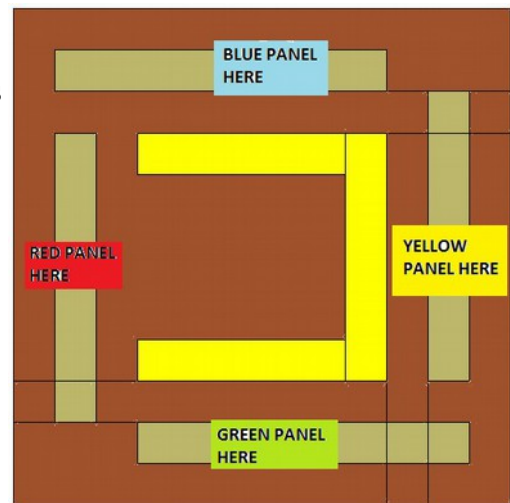


**Yellow panel**

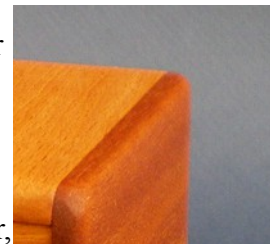


### Useful tips for making your own box

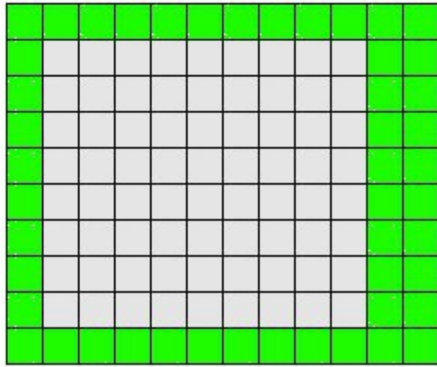
1. This box require a precise work. For this reason cutting all pieces with minimum table saw setup is important for obtaining pieces with equal dimensions. I started to cut a 10T wood strip. (enough long for all pieces with 10T width). After 1 cut 10Tx10T piece without changing my table setup. After I cut two 12Tx12T piece and 12Tx10 piece from the 10T width strip that I was prepared at the beginning. Next step I cut a strip 8T enough long for middle panel piece. An before changing my saw setting 1 cut 8x8 pcs. And I continued by cutting all other pieces
2. This box require some assembly work. I advise putting a letter (A,B,C,D) with a pencil to the back side of each panel an same letter to the rail that this panel work on it. After you can adjust by sanding each panel to its rail.



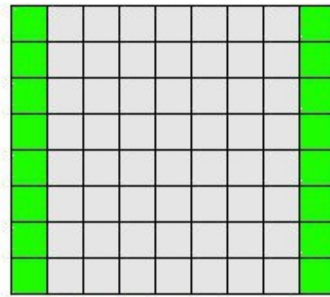
3. After the asseby if you are happy with the result you can sand all the box and obtain a good appearance. I rounded all edges for my box. But this is a choice if you like you can make a small chamfer to box edges by sanding. My opinion, all sharp edges looks bad.
4. And finally, if you understand how this box work, by changing dimensions you can easily modify this box and make rectangular, smaller or bigger boxes.



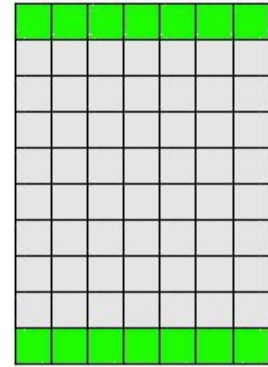
**Green panel pieces**



**Outside piece**

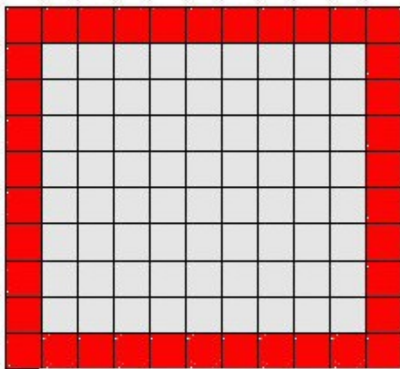


**Middle piece**

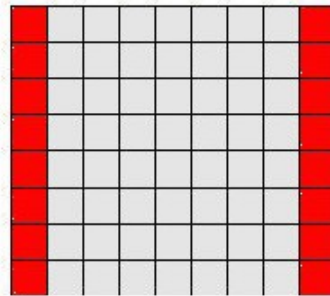


**Inside piece**

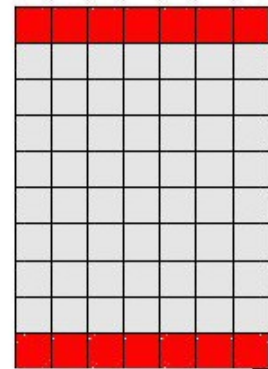
**Red panel pieces**



**Outside piece**

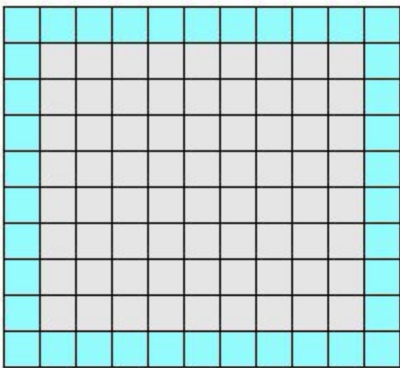


**Middle piece**

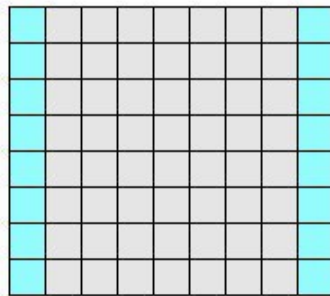


**Inside piece**

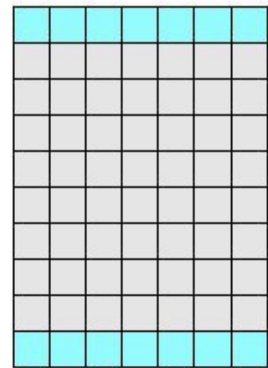
**Blue panel pieces**



**Outside piece**

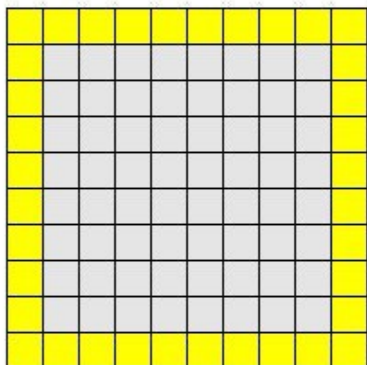


**Middle piece**

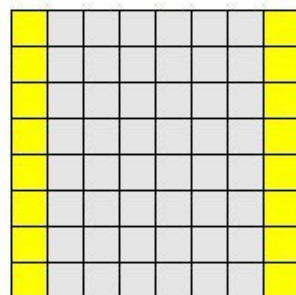


**Inside piece**

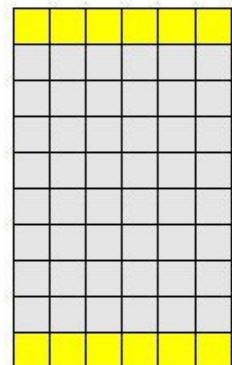
**Yellow panel pieces**



**Outside piece**



**Middle piece**



**Inside piece**