

# How to make a jigsaw/puzzle

---

## What do you need?

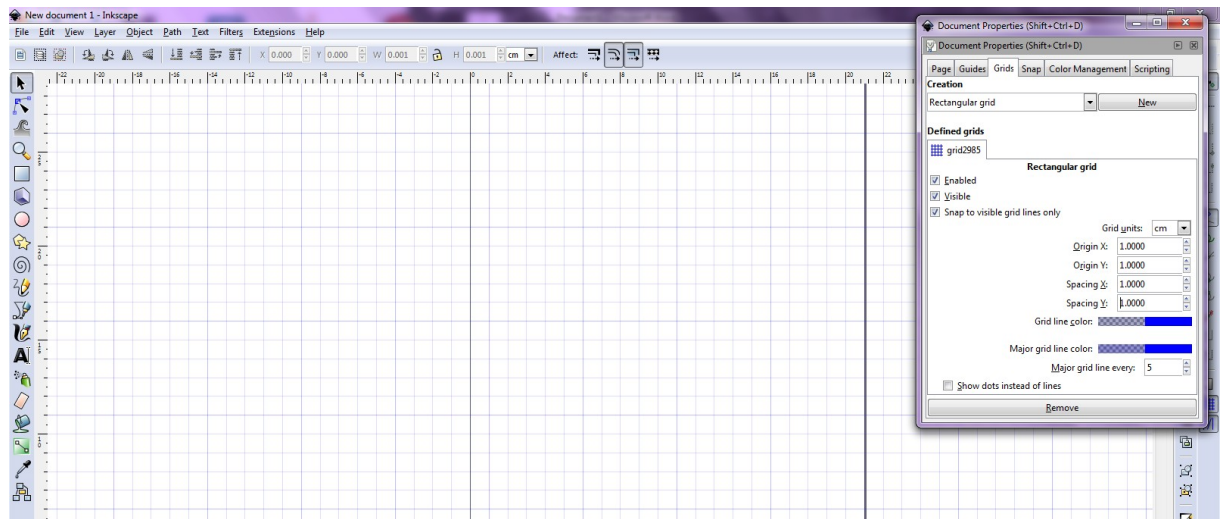
- A laptop/computer
- The program Inkscape (<http://inkscape.org/>)
- A laser cutter
- cardboard for tryout
- Final material (wood, plexiglas...)

## Short version of the plan:

1. Make the drawing that you want
2. Make squares that perfectly fit into the square from the drawing
3. Place the squares and use different colors
4. Place the pins where you want them (union or difference)
5. Take out half of the parts. We don't want to have double lines. This reduces the cutting time and the loss of material by cutting.
6. Make sure every outline is covered.
7. Cut out in paper to see if everything is ok. Sometimes union or difference went wrong and the laser cutter cuts the pin of.
8. Cut it out in the wanted final material (Plexiglas, wood...)
9. Have fun making the jigsaw.

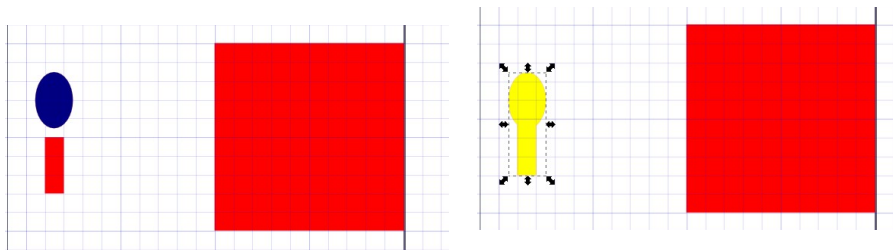
## How do you start?

- ❖ Open Inkscape and draw a box that is the size of your puzzle.
- ❖ Now make your drawing in that box.
- ❖ To make the puzzle parts:
  - Go to File -> Document properties -> grids -> new. There you can put in a grid in your working file. This can help to align the parts.



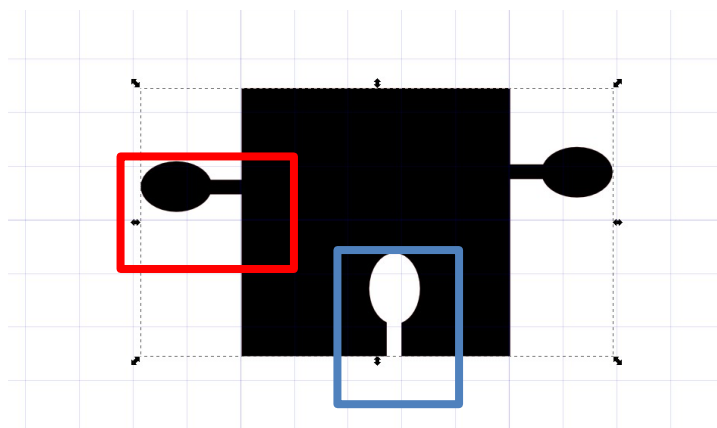
\*see more info about the grid and what you can do with it.

- Make a box the size you want to have the puzzle piece.
- Now draw a little rectangle and an ellipse. And use Path -> union to join them together. Now duplicate (ctrl + D) them, together with the squares you made.

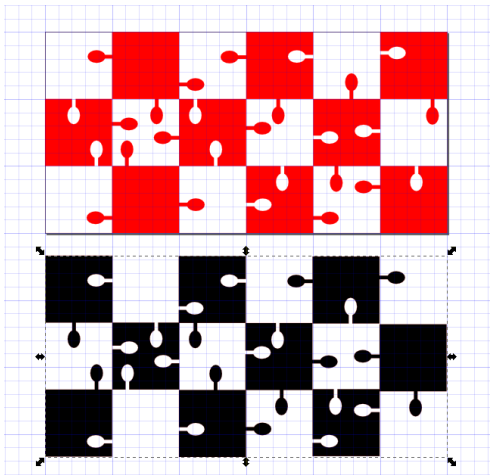


size of your drawing (You can take the drawing out and put it somewhere else in your tab so you can work without being obstructed by the drawing).

- Put them into the big box that has the size of your drawing (You can take the drawing out and put it somewhere else in your tab so you can work without being obstructed by the drawing).
- Put the pins in our out of the square and use. You need to select both.; pin and square.
  - Path -> **Union** to join them
  - Path -> **Difference** to make a hole.



- Take out half of the jigsaw pieces. We don't want to have double lines. This reduces the cutting time and the loss of material by cutting.



*\*note: I've been using fill to see the pieces better while working on them. Keep in mind that when you're going to cut out the file, you need to take the fill out and put stroke style up to 0.01 mm. It is good to do this, the stroke style, in the beginning when you're making the pieces. So the lines are 0.01 mm everywhere and you can align them directly according to that thickness.*

- ❖ Make a try in paper. You never know that you missed a line or something went wrong with the union/deference. Cut it out in the wanted final material. In mdf wood it takes around 40 minutes
- ❖ Have fun making the jigsaw.

*\* About the grid:*

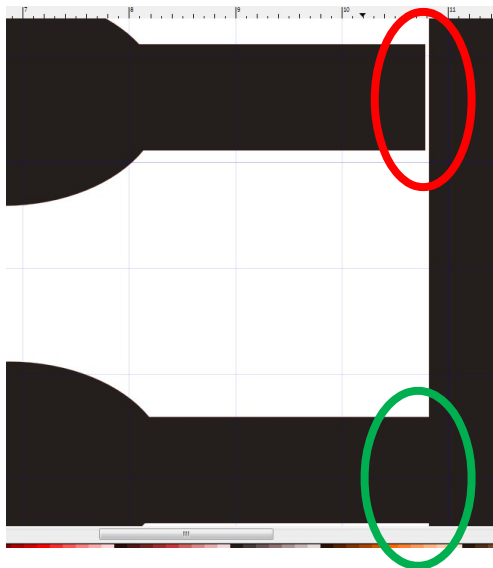
The grid makes it a lot easier to make boxes or align things.

For example when you're trying to draw a line ( Draw

Bezier curves and straight lines (Shift + F6)) it will guide you. And you will get the message: "Handle to grid intersection."



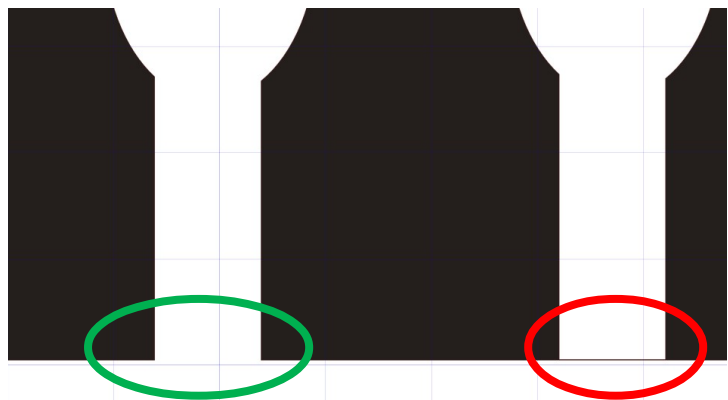
*\* About union and difference:*



It is important to connect the parts right when you use union and difference. In the two pictures above you see how it can go wrong.

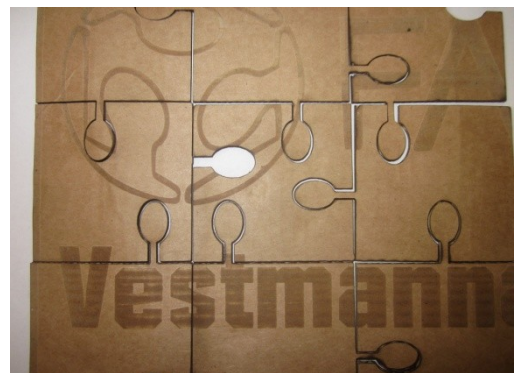
The two parts didn't connect with each other. But they changed color because of the union. You can have this because of too thick stroke style lines. For example you work with lines thicker than 0.01 mm and you change it in the end. The second pin is how it's supposed to be.

The same for the picture to the left. A little small red line is still there in the second pin. The laser cutter will cut this out and you'll lose the pin. This might not be important if it's supposed to be a hole but remember that that same pin is a union with another part.



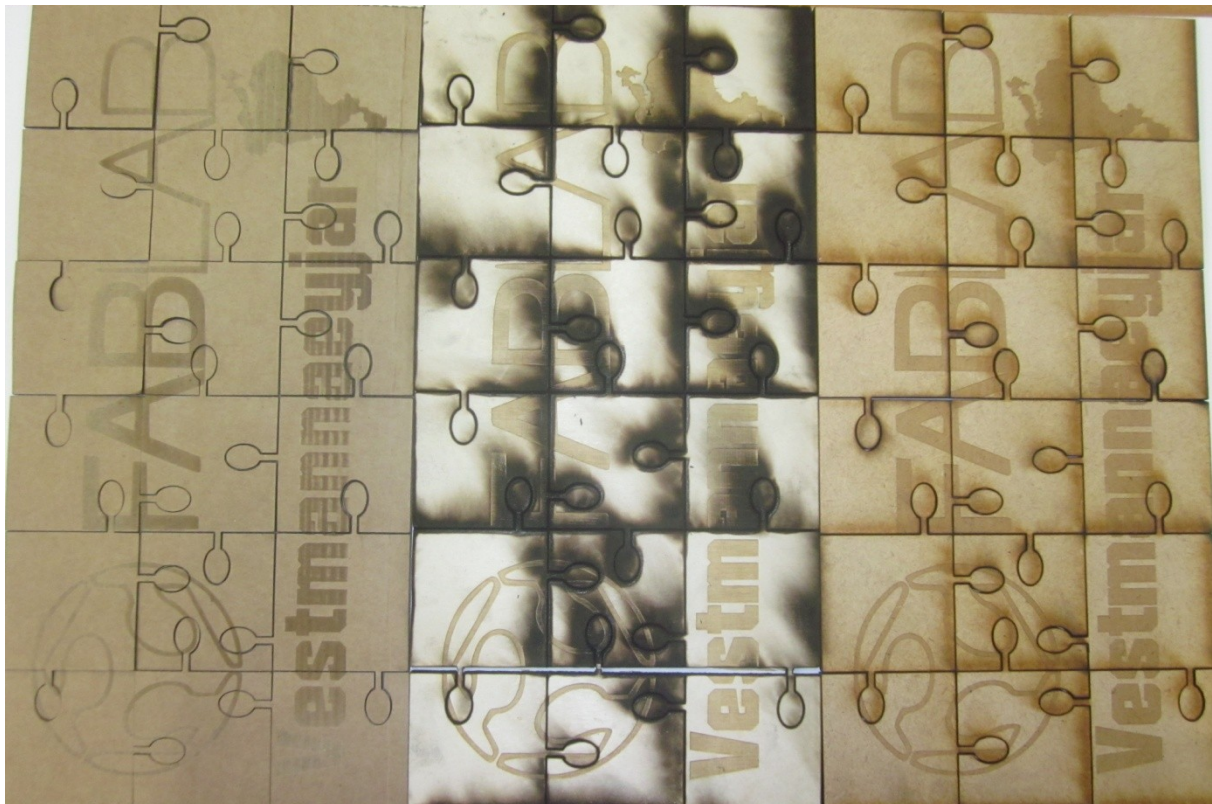
Another note is to be careful with the pins. They break very easily. So be sure that you make them big enough in the computer. The pins from my file are a little bit thicker than 2 mm.

As we can see in the next picture, during the first try out in cardboard one of the pins went missing. This is why we always first try in cardboard before making a final version.



### Technical details (epilog laser):

		cardboard	Wood (3mm)	MDF(3mm)
Raster	Speed	80	40	40
	Power	40	100	100
Vector	Speed	40	4	4
	Power	90	100	100
	Freq.	2500	500	500
Duration	\\		40 min	40 min



As you can see the settings for the laser cutter and cardboard were perfect. So were they for the MDF plate (3mm). While cutting out in wood there were some problems. The laser didn't go totally through and the pieces got burned.