

7 by 9 project

Make 1

First draft sent to laser by Thursday 10/19 - Friday 10/20

Final project due Tuesday 10/24 – Wednesday 10/25

Your task is to design and laser cut a creation of some kind that cuts out of a single sheet of thin cardboard that measures about 7 by 9 inches. The idea is that you will design something you laser cut that is flat, holding itself together with little tabs, that they then pop out and assemble following simple directions that you include.

In other words, even though you will laser cut your creation, you want it to be held into place on the cardboard with small tabs that the user has to tear or break to get the pieces out.

You will create a landscape, a container, an object, a stage or scene with multiple characters, a spaceship, a forest scene, a family get together, a monster truck rally, a famous World War II battle, a racecar, a bouquet of flowers, an aquarium of fish, an ocean surfing scene, a sunset, an airplane, a board game, a marble maze, a picture frame, a boat, or... you get the picture: just about anything you can imagine.

Requirements:

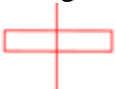

1. Your creation holds together after it is laser cut so that someone can later pop the parts out to build it.
2. Your creation efficiently uses the available space (8.75 by 6.75 inches), not leaving big spaces blank.
3. Your creation is interesting, cool, and awesome. (Hard to define, but we know "awesome" when we see it; please spend some time to make something that you can be proud of; stretch yourself.)
4. Your creation has clear instructions (on cardboard or on separate paper) that explain how to put it together.

Advice for creating this:

1. Start by setting your document size to 8.75 inches wide and 6.75 inches tall in Document Preferences under the File menu in Inkscape. Your entire finished project needs to fit inside of this rectangle.

2. Design your creation. I think it works better to not worry about the tabs in the beginning, just make the pieces you want to make, then go laser cut them and see how they fit together. Plan on laser cutting several drafts before you manage to get things right. This isn't a one and done quick project. After you have the pieces all fitting together like you want, go back and do some node editing to make the pieces stay in place after the sheet is laser cut. See point 5 below.

3. Slots where pieces join should be 2mm thick. Use rectangles that you leave on the drawing, **do not do Path>Difference**; you may end up needing or wanting to change slot sizes.

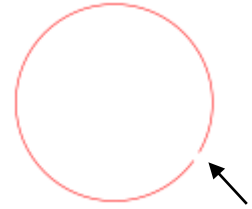
I'm saying leave your slots like this:  not like this:  I'll say this again in all caps: **DO NOT USE PATH DIFFERENCE FOR YOUR SLOTS. IF YOU DO I WILL ask you do re-do your project.**

4. Your creation needs to make good use of most of the material and also be interesting and cool. This isn't something you should be finishing in one sitting. Take some time to make something exciting and interesting.

(continued on next page)

5. In the Inkscape file using black text label parts with letters or numbers as appropriate so that you can give clear instructions (connect part 1 with slot 1, for example.) Make all text black, no fill, and .1 mm stroke.

6. When you have cut out your creation and put it together and everything is perfect, only THEN should you break some nodes to make the pieces stay in after the laser cutting. For example, in one creation I had some wheels. While testing they were regular circles (image to the left), but after I got everything working I put a little gap in them by editing the nodes to make the wheels stay in the cardboard until someone wanted to assemble my creation (image to the right.)



7. After you get it all designed for laser cutting, decide if you need written instructions for assembly. Imagine someone who is not you trying to put your creation together. Did you put clear marks/indicators on the cardboard to help, or would some instructions help? If necessary, write up instructions on how to put things together. Go back and label parts if you need to. Put the instructions into a Google Doc. You will turn in both the Inkscape file and your Google Doc if appropriate for this assignment. Spelling, grammar, organization, and clarity matter for the instructions. Your document should include your name, the name of your creation (for example, "Mars Rover", or whatever), and instructions to assemble the creation.

8. You may use thread or toothpicks or potentially other simple extra additions if you want to help make your creation totally awesome.

9. For extra credit, design and 3D print something that complements your creation.

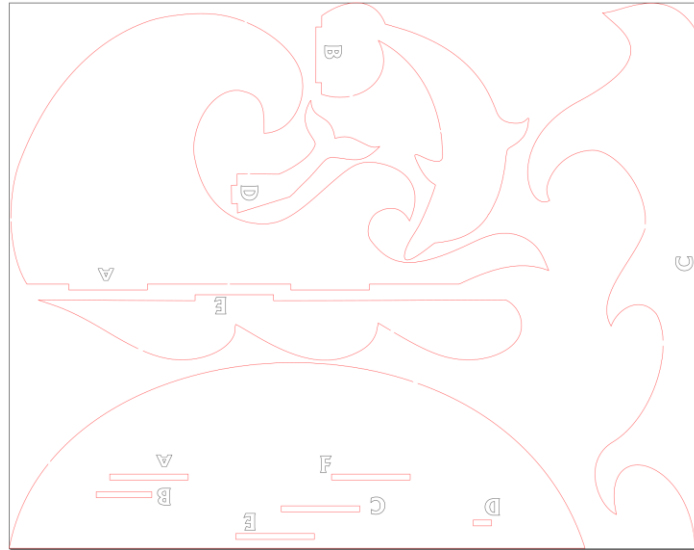
A quick summary again:

- Your document is 8.75 inches wide and 6.75 inches tall.
- Design something really cool that stays all together on the cardboard after being laser cut until someone breaks the pieces out and assembles it. Your design uses most of the space on the cardboard.
- Your creation must not require glue or tape to hold together. Use 2mm slots to hold things together.
- You'll make multiple drafts of this; don't be afraid to try something, then make changes and try again, repeating this process as much as necessary. Iteration is the inventor's friend.
- Get it all working, THEN break nodes to add little connectors so that the pieces don't fall out when laser cut. Don't worry about that part of things until you've got it working.
- When you've got it all as you like it, create written instructions if necessary that tell the user how to put it together clearly and correctly. Show Mr. Hays your assembled creation at this point (but you're not done, keep reading...) If you create instructions, please write "see instructions" on your 7 x 9 sheet in black with the laser.
- When you are done, you need to turn in three things: 1) a built copy of your creation, 2) a laser cut copy that is not popped out of the cardboard, 3) a copy of your instructions if you created instructions.
- On another day everyone will have a chance to put together someone else's creation using the instructions.
- Turn in the Inkscape file and written instructions if separate on the Google Classroom.

See examples on the following pages.

Example:

Here is an example project that a student made last year. First, here is the Inkscape file view:



After being laser cut, see how the parts are all still connected to the main cardboard piece?



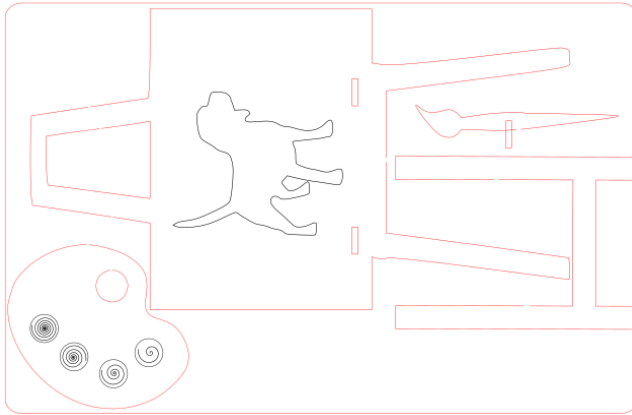
This is done by breaking the nodes so there are little parts that aren't cut through by the laser. You can see the little breaks in the paths above in the Inkscape screen shot. Each piece above has one or more breaks so that it won't fall out until someone purposefully pops the piece out to build the project.

Final assembled creation:



See next page for 3 more examples.

Here is another project, in Inkscape, and built:



Here's another all assembled:



And another:

