

Cork Coasters Kit Tutorial

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Level of Difficulty: 2/5



[Watch the Video Tutorial Here](#)

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Introduction

This kit is a great way to get started with using **Adobe Illustrator** and the **laser cutter**! You'll learn how to create an Illustrator file specifically for laser cutting and get some hands-on practice with the laser cutter. Additionally, this kit includes a coaster holder, which will introduce how you easily build things from laser cuts using tabs. Overall, this kit is a great place to learn more about Adobe Illustrator, especially if you have never used it before!

Required Trainings

Trainings are required to use certain equipment at OriginLabs. These trainings do not expire. Please complete the following trainings before picking up your kit:

- Laser Engraver

What's in the Kit?

The following are the items that should be inside your kit. If anything is missing, please inform an OriginLabs staff member.

- 12"x12"x0.25" Cork Sheet
- 7.75"x11.75"x3mm Cherry Veneer Wood Sheet



Figure 1: A sheet of cork and a sheet of cherry veneer

Materials to Purchase

If you do not wish to purchase the kit at OriginLabs, the following are the materials you should purchase/acquire:

- 8"x8"x0.25" Cork Sheet
- 7.5"x7"x3mm Wood (or another material) Sheet

Safety Overview

While running the laser engraver, you should always:

- Make sure the ventilation system is turned on
- Only cut/engrave approved materials
- Do not open the laser for at least one minute after the job is finished and definitely not when there is visible smoke
- Never leave the laser unattended.

If you need a refresher on how to use the laser engraver, please let staff know as **the laser engraver ALWAYS poses a fire risk**, and you should always make sure you are taking the necessary precautions to prevent a fire while using this machine.

For fire prevention:

- NEVER leave the laser unattended
- Never design your file so that parallel cut lines overlap
- Don't place parallel or several cut lines extremely close together
- Don't attempt to cut warped material
- Make sure your machine is focused to the material inside the machine
- Pause/stop the machine whenever you see a small flame (it might go out on its own without intervention).

If there is a fire, your next actions will depend on the size of the fire, although all of them do **begin with pausing the laser**.

- **For small fires**, just pausing the laser may be enough, or you may need to pat it out with our fire-resistant gloves next to the fire blanket.
- **For medium fires**, you'll want to use the fire blanket.
- **For larger fires**, do your best to take the material out of the machine, and then extinguish it with a fire extinguisher. If you are unable to take the material out of the machine, the last resort is to use the fire extinguisher while it is still in the machine. Using the fire extinguisher directly into the laser will permanently break the laser, so it's best to leave it as truly the last resort.

Report all incidents of fire that required intervention to OriginLabs staff.

General Illustrator Handbook & Consultations

This tutorial will not cover the nuances of navigating in Illustrator as well as other not directly relevant tools/settings. We at OriginLabs have developed a comprehensive guide on how to use Illustrator, specifically for laser engraving/vinyl printing. You can access this handbook in this project's SharePoint.

If at any point you need additional Illustrator help throughout this tutorial, you can schedule a free consultation with an OriginLabs staff member here: <https://originlabs.psu.edu/services/consulting/>

Creating Custom Cut Lines

If you do not want to create your own custom cut lines, you can find templates for cut lines made for 12"x12" material here in this project's SharePoint.

1. Start by making a new Illustrator file. You will want to always make your artboard the size of your material when laser cutting. In this case, it should be 12"x12"
2. Select the shape tool, which you can see in **Figure 2**. If you right or double click it, you can get it to expand and you can choose another shape if you'd like. However, this part will review using the rectangle tool first.
3. Now with the rectangle tool, you can click your artboard and input the width and height to be 4"x4" and press "Okay". You can also just click and drag your mouse on the artboard to make a rectangle, and then change the width and height in the properties tab.
4. Now, you'll want to change the stroke color to red. You can just select the red swatch in the color menu as seen in **Figure 3**

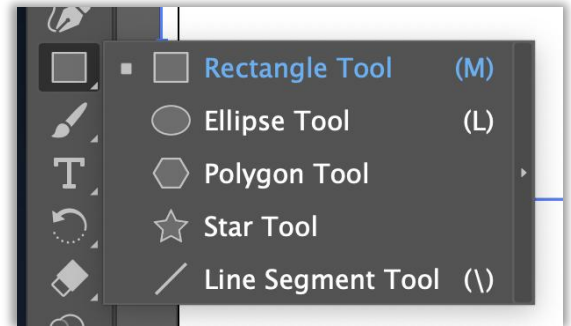


Figure 2: An expanded view of the Shape Tool.

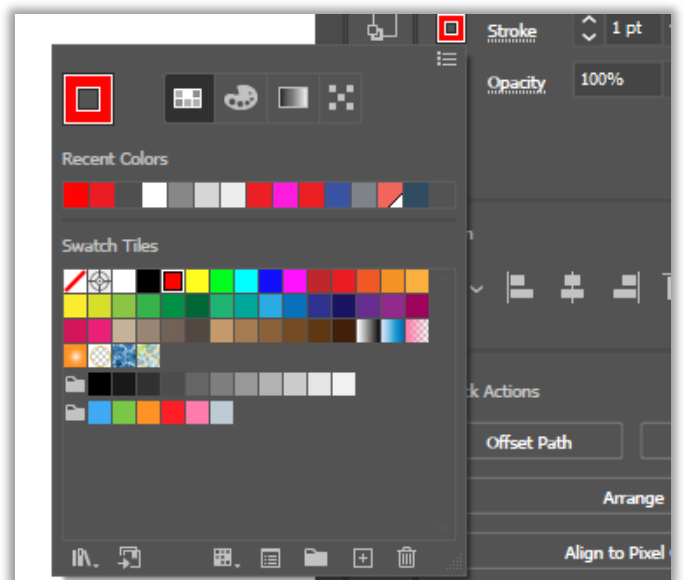


Figure 3: View of the default RGB swatches, with the red swatch selected

5. Technically, we've now made a cut line! Trotec Ruby (the laser software) reads any red stroke line, no matter the width, as a cut line. But now we'll go over all the ways you can edit this rectangle to become a more customized shape. The only **requirement** is that **your coaster cannot exceed 4" on at least one of your overall dimension values** (width or height), or it won't fit into the provided coaster holder file.

6. Rounding the corners of your rectangle

- a. Select your rectangle
- b. In each of the 4 corners, a little white and blue circle should appear. Click one of them, and drag it inwards to round the corners (**Figure 4**)
- c. If you wish to have different levels of rounding for each of your corners, use the direct selection tool to click one corner's vertex (little blue square), and then drag that individual corner inwards to round it

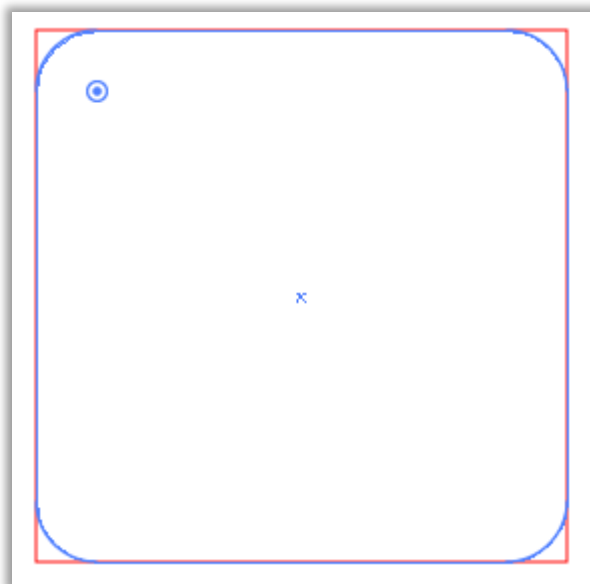


Figure 4: A rectangle in the process of getting its corners rounded.

7. Making custom shapes not available within the shape tool

- a. Select the pen tool (**Figure 5**)
- b. Click somewhere on your artboard to get started
- c. Then, as you move your cursor to another spot on the artboard, you'll see a blue line following you around which will become

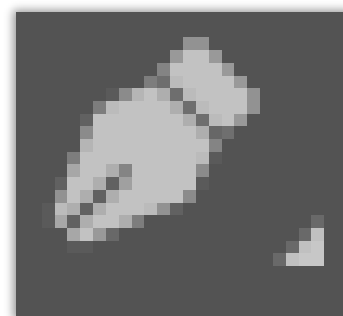


Figure 5: The Pen Tool icon.

permanent once you click somewhere else on the artboard
(**Figure 6**)

- d. Continue to keep clicking around until you've made the shape you want, then make sure to click the very first vertex you placed to complete the shape

- i. You can always go back in with the direct selection tool to move your vertices around if you didn't like your initial placement
 - ii. You can also use the pen tool to add/delete vertices from your newly completed shape

- e. If you want to make a new shape that is curved, instead of just clicking and releasing to create a new vertex, you'll want to click and drag to curve the current edge (**Figure 7**)

- f. You can also use all of these tips to edit shapes already made from the shape tool

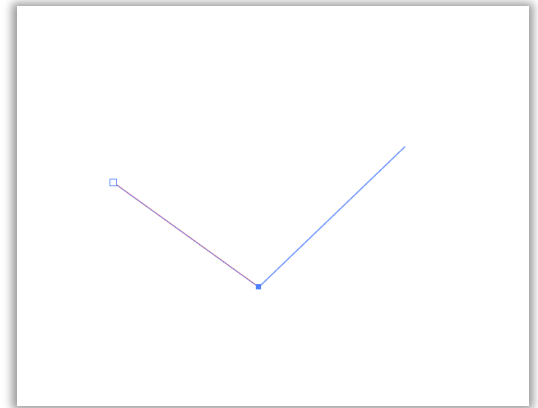


Figure 6: A demonstration of what making straight lines using the Pen Tool looks like

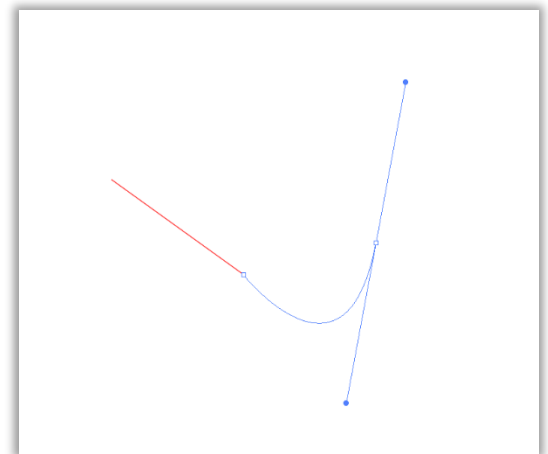


Figure 7: A demonstration of what making a curved line using the Pen Tool looks like.

8. Merging shapes/Creating cut outs

- a. Create the shapes you want to merge or cut out of your coaster
- b. Drag them to where you want them placed

- c. For merging, select your coaster and all the shapes you want to merge, then go to the properties tab and select “Unite” **(Figure 8)**

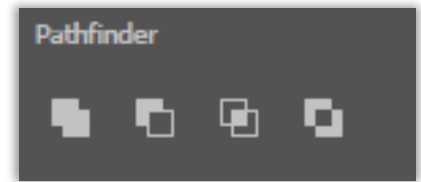


Figure 8: The Unite, Minus, Intersect and Exclude operation icons.

- d. For making cut outs, select your coaster and all the shapes you want to cut out, then go to the properties tab and select “Minus”
- e. For more complicated merging/minus operations, you’ll want to use the shape builder tool **(Figure 9)**

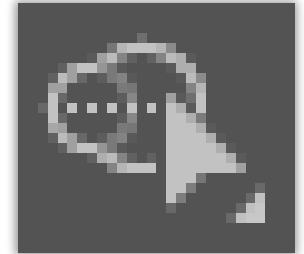


Figure 9: The Shape Builder Tool icon

- i. To use the shape builder tool, you’ll want to select all the shapes you want to merge/minus, then select the tool
- ii. Click and drag your cursor through all the sections you’d like to merge and avoid the sections you’d like to minus **(Figure 10)**

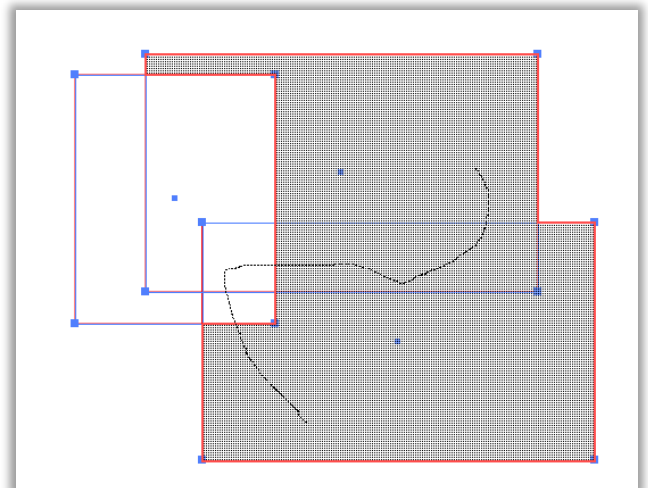


Figure 10: A demonstration of what the process of merging objects using the Shape Builder Tool looks like

9. Creating cut lines based on the shape of your coaster design

- a. *If you’d like to do these kinds of cut lines, you need to make your design FIRST. So, head to the next section, then return here when you’re ready*

- b. Make a copy of the designs you want to make a cut line of (**Figure 11**)
- c. Now merge those designs using the unite function (**Figure 12**)
- d. Go up to the top of your screen where there is the menu bar, and select Object>Path>Offset Path...
- e. A little menu should pop up with the following fields (**Figure 13**):



Figure 11: An otter holding a cup of coffee which will be the design for this example



Figure 12: The entire design merged into one shape

- i. Offset
 - a. The distance from your design and your new cut line
- ii. Joins
 - a. Miter will give you sharp edges; round will give you round edges; bevel results will vary
 - b. I prefer to use round as miter can have unexpected results for many designs
- iii. Miter Limit
 - a. If you selected miter as your joins type, this will increase/decrease the sharpness of your edges
- f. Input the values you'd like in the above fields, and press okay

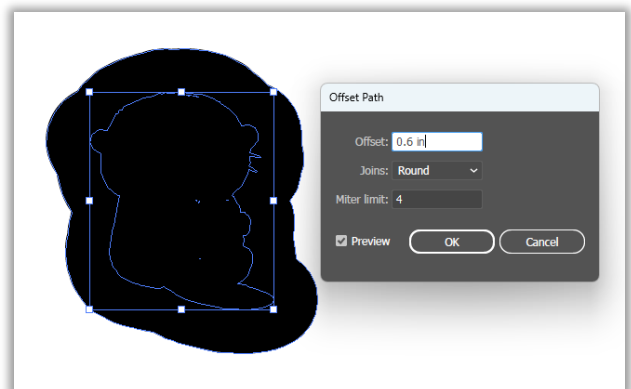


Figure 13: The Offset Path menu and a preview of how expanded the design will become with these Offset Path settings

- g. Now, select both the offset path you just created and united design you based it off of, and select unit to combine them both
- h. Now change the fill to white/no fill and the stroke to red, and now you've made a cut line that follows the shape of your design! (**Figure 14**)



Figure 14: The design with its new cut line that follows the design.

Adding an Image to Your Design

Vectoring your image is recommended as when you import your Adobe Illustrator file into Trotec, the photo may not register. Additionally, since the laser engraver is so detailed, any images that are very pixelated will result in low quality engravings.

Option 1: Vectorizing the Image

1. Import an image by dragging it from your file explorer into your Illustrator document
 - a. Or you can just copy and paste it from the internet
2. Click on your Image. A button that says “Image Trace” should appear at the bottom of the Properties Panel (**Figure 15**)

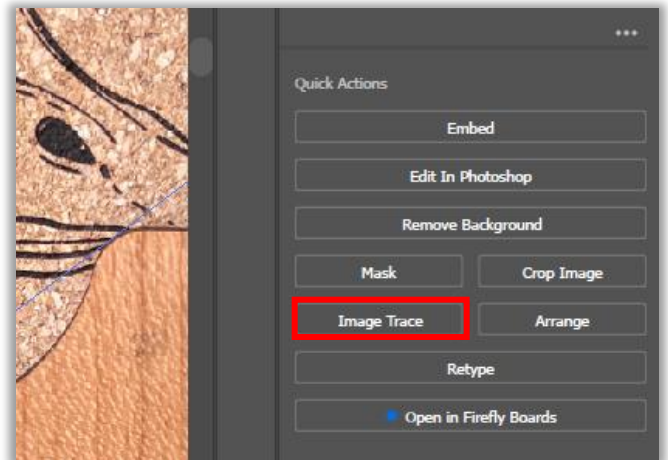


Figure 15: The options in the Properties Panel when an image is selected. The Image Trace button is outlined in red.

- a. If you want to remove the background, there should also be an option in the Properties Panel near “Image Trace” that says, “Remove Background”. It will automatically remove it for you



3. Click it and select the preset “Shades of Gray”
4. Your image is now a vector. This means that your image is no longer made of pixels, but rather vector-based shapes (**Figure 16**)
5. You can use the Eraser tool or manually select each individual shape to manually erase parts of the image you may not want



Figure 16: Before (top) and after (bottom) of removing the background and image tracing an image in Illustrator

Option 2: Leaving the Image as a Raster

1. Import an image by dragging it from your file explorer into your Illustrator document
 - a. Or you can just copy and paste it from the internet
2. Click your image
3. In your menu bar at the top, navigate to Edit>Edit Colors>Convert to Grayscale
 - a. Do this even if your image is already grayscale
4. Your image should be all set within Illustrator
5. Inverting the photo

- a. When you import your Illustrator file into Trotec, your image will likely invert itself.

You can invert your image within Illustrator (Edit>Edit Colors>Invert Colors)

- b. Or you can do it within Trotec

- i. Click your image and press the pencil icon that appears in the top right corner
- ii. Flip the levels by dragging the vertex in the top right corner to the bottom right and the vertex in the bottom left corner to the top left
- iii. Click “Apply”

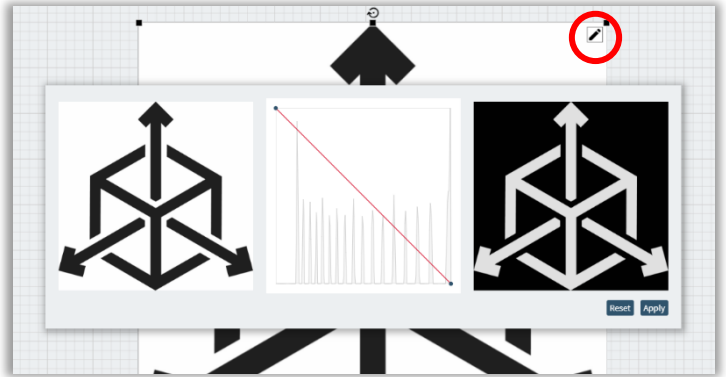


Figure 17: The photo editing menu in Trotec that appears once you click the pencil icon (circled in red)

Adding Text

1. Use the Type tool to create regular, linear text objects
2. Use the Type on a Path tool (**Figure 18**) to create text that follows a path (such as an arch)

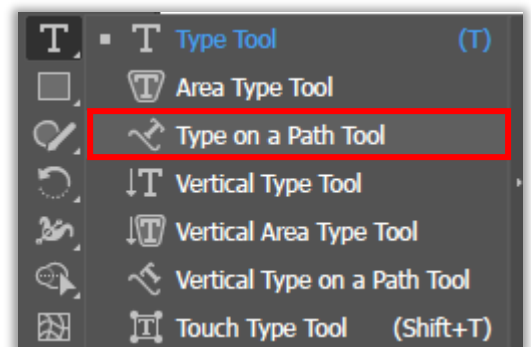


Figure 18: The Type Tool expanded, with the Type on a Path Tool outlined in red

- a. You must create a shape/path first, then click on it using this tool (**Figure 19**)

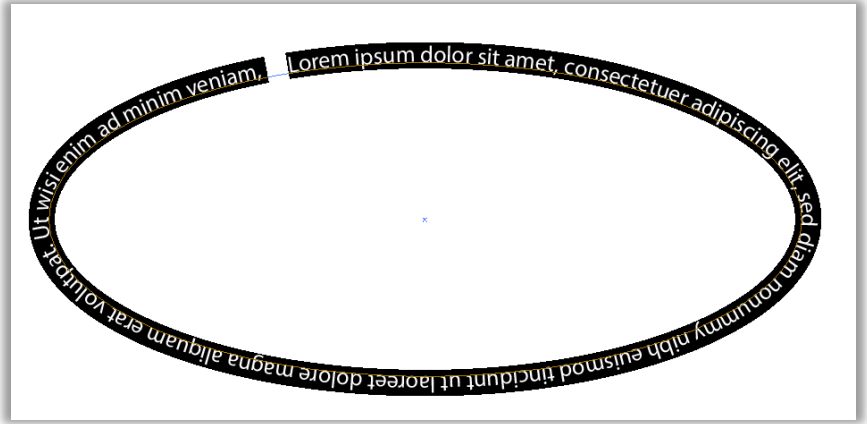


Figure 19: The Type on a Path Tool used on an ellipse.

3. Edit your text properties within the Properties Panel
4. Once you are finished editing your text, you MUST convert it to outlines. This will convert your text object to a shape object. Text objects hold a font value, while a shape object is just a bunch of vertices. Trotec Ruby will not be able to read your font as it doesn't have every font stored.
5. Therefore, if you care about your font, click your text, then head to the bottom of the Properties panel, and click "Create Outlines" (**Figure 20**)

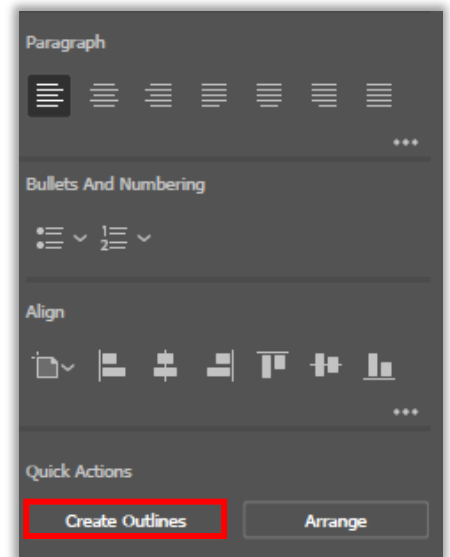


Figure 20: The Properties Panel when text is selected with the Create Outlines button outlined in red.

Laser Cutting Your Coasters

Cork is very flammable. Keep a close eye on your piece as it engraves and cuts.

1. Do all the typical set up for a design in Trotec Ruby

2. The material setting you'll want to select is "Cork (6mm)"
3. Change the setting so that it will ONLY engrave, not cut
 - a. You can do that by selecting the red square next to "Cut Quality", then clicking unassign
4. Engrave your designs
5. Once the engraving is finished, now set up your file so that it will ONLY cut
 - a. You can do that by selecting the black square next to the "Engrave Quality" settings, then clicking unassign
 - b. You will also now have to click the red square in the unassigned section and now select "Cut Quality"
6. BEFORE YOU START YOUR JOB, we will want to dampen the cork. You can do that by either removing the cork from the laser and spraying it with the spray water bottle by the lasers OR if you are concerned about your designs misaligning, you can dampen a towel and press it on your cork while it is still inside the laser
 - a. If you decide to dampen a towel, do not drip anywhere near the laser components
7. Now you can cut your design. You may have to do 2 passes

Cleaning your New Coasters

1. You likely noticed while removing the coasters from the laser that your fingers are now covered in soot from the edges of the coaster. Dampen a towel and wipe off the edges until you've removed the soot

- a. While cork is naturally resistant to mold, I recommend not fully submerging it into water to clean as it increases the risk of it not drying properly and therefore increasing the risk of it growing mold

Making Your Coaster Holder

Download “coaster holder.ai” from this project’s SharePoint to access the coaster holder template file.

1. The template linked above is designed for 3mm wood. If you do wood thicker or thinner, you will need to adjust the tab size to match your material. For those who purchased the kit, you don’t need to do this step
2. You can add designs to your wood in Illustrator, but I recommend sticking to only black and white designs as the cherry veneer wood doesn’t do photos well
3. Set up the template in Trotec Ruby and select “Wood Veneer Cherry | 3mm (0.12)” as your material settings
4. Fit your pieces together like so:
 - i. Place one of the front panels down first

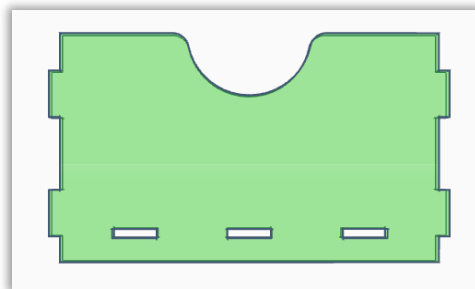


Figure 21: Front panel of the coaster holder

ii. Then, push in the bottom panel

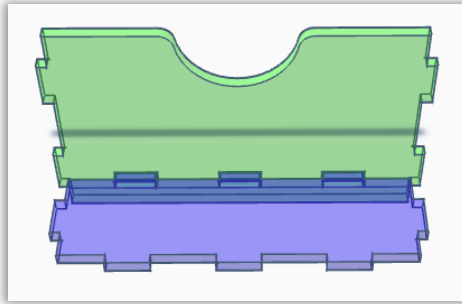


Figure 22: Front and bottom panel of the coaster holder connected

iii. Next, do the other front panel

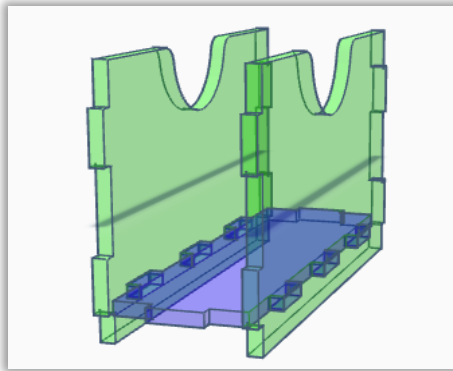


Figure 23: Both front panels and the bottom panel of the coaster holder connected

iv. Lastly, place the two side panels on

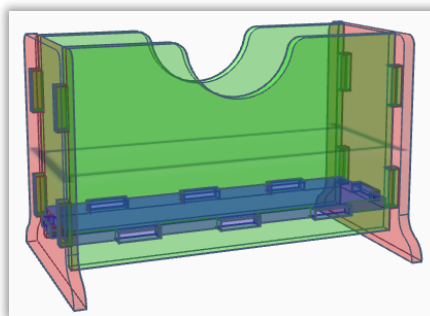


Figure 24: All panels of the coaster holder connected

5. The coaster should fit together perfectly and doesn't require any adhesive to keep it together

6. It should now be able to fit four 4"x4" coasters with ease, and your coasters are now finished!

Share Your Experience!

Congratulations on finishing one of OriginLabs' kits! Hopefully you had fun and learned something new along the way!

We would really appreciate it if you could take 5 minutes of your time to fill out the following **survey** on your experience:

<https://forms.cloud.microsoft/r/r97HNGDcgR>.

We would love to hear your feedback so that we can make these kits as accessible, fun, and educational as possible!

If you plan to post your build onto **Instagram**, please tag us at @originlabs_build

If you have any **questions or concerns** about the kit or about OriginLabs in general, please reach out to originlabs@psu.edu and we'll get back to you as soon as we can.