

DESIGN BASICS: EASEL FOR THE CARVEY



E  S E L TM

by **INVENTABLES**[®]

Easel is the online software used to create designs and produce items with the Inventables' Carvey. The Carvey is a 3D carving machine. 3D carving is a subcategory of CNC. (CNC is a process that uses computers to control machinery.) The Carvey is one of the machines available in Elmhurst Public Library's Makery.

GETTING STARTED

What is the Carvey?

The Carvey is a machine with a drill bit that carves out a design or shape into your material. The most common material used on the Carvey is wood, both finished and unfinished. Additional materials include ABS, bamboo, plywood, cast acrylic, Corian, expanded PVC, linoleum, MDF, PCB, and HDPE. The materials do need to be flat in order to be properly clamped into place.

For more info, visit inventables.com/technologies/carvey

For project ideas, visit inventables.com/projects

Visit elmlib.org/makery for more info about the Library's Makery!

Makery Hours:

Sunday: 1-4:30 p.m.

Monday: Closed

Tuesday: 12-8:30 p.m.

Wednesday: 12-5 p.m.

Thursday: 12-8:30 p.m.

Friday: 12-8:30 p.m.

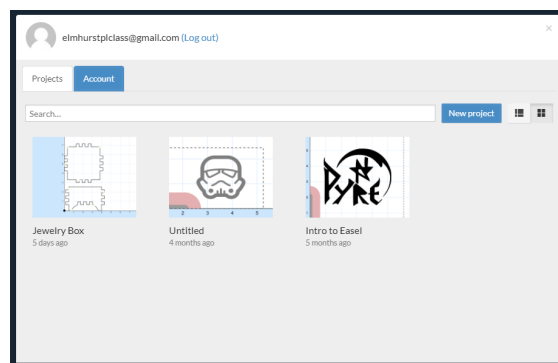
Saturday: 9 a.m.-4:30 p.m.

Easel Account

Before you come to the Makery to use the Carvey, you must have your design prepared. Design preparation is completed with the Easel. Easel is a web-based design software used by the Carvey and other machines developed by Inventables. To access Easel, visit easel.inventables.com. You must be signed in to an Easel Account to use the software. If you are not a returning customer, select "I am a new customer" and create an Easel Account using your email address.



A cutting board made with the Carvey

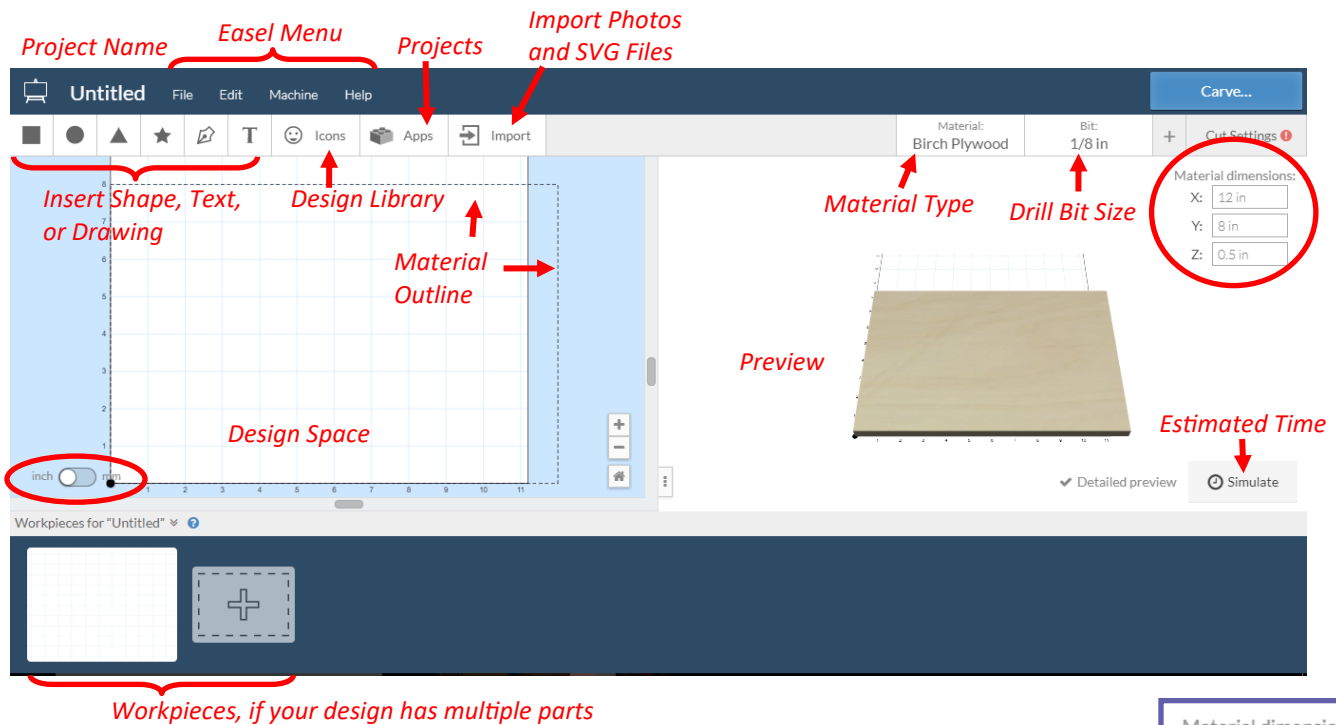
A screenshot of the Easel website's account registration page. The page is titled "MY ACCOUNT" and has two radio buttons: "I am a returning customer" (unselected) and "I am a new customer" (selected). Below are input fields for "Email", "Full Name", and "Choose a Password". A yellow "CONTINUE" button is at the bottom.

Since it is web-based, all your Carvey Projects are stored on your Easel Account. This makes it easy to work on designs from home and at the Library. Select **New Project** to start a blank project.

GETTING STARTED

Easel

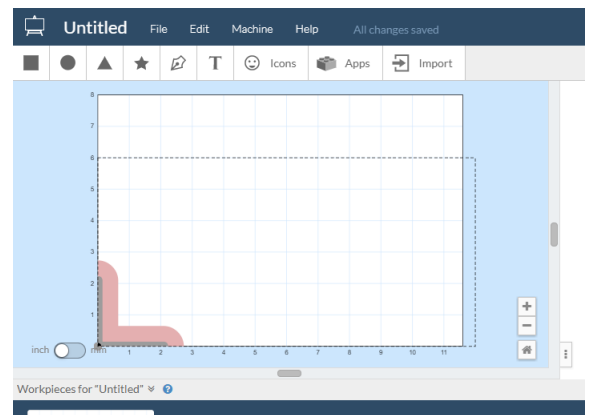
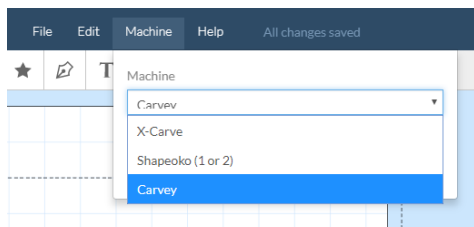
This is what the Easel should look like when you start a new project.



Prepare the Design Space

Before we create a design, let's first prepare the design space for our materials. In our example for creating a cutting board, the dimensions of the wood are 6" x 12" x 0.5". Use the **Material Dimensions** menu on the far right to adjust accordingly. Since the Easel is used by all the Inventables' machines, let's indicate that our project will be cut with the Carvey. Select **Machine** from the top menu. Then select **Carvey** from the drop down menu. The bottom left corner will have a red diagram. This is where the clamp goes, so designs cannot cut there.

Maximum dimension is 8" x 11.6" x 1.75".



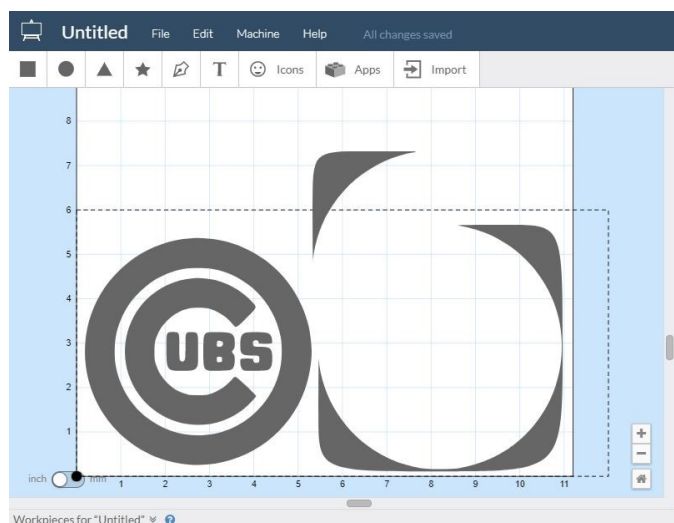
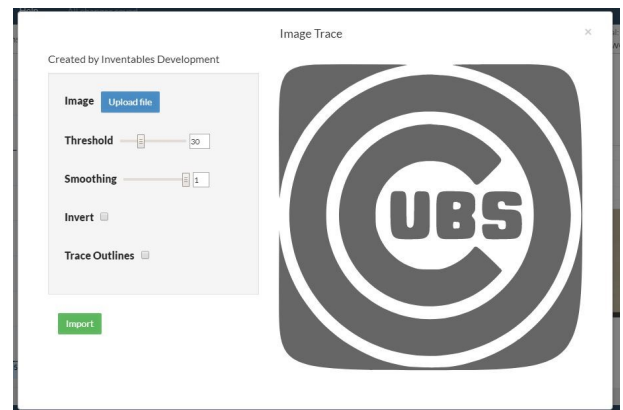
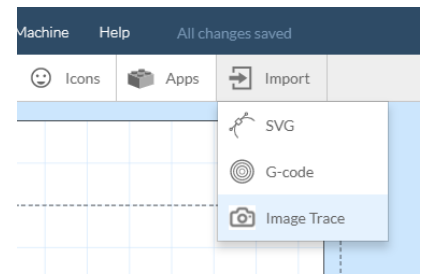
IMPORT

Import a Design

Easel has a library of designs available for free using the **Icons** menu, but other JPEG images can be imported and converted. JPEG images can be found anywhere, but the most common source is Google Images. The Easel software only reads in binary (or simply, black and white), so color photos that are imported will be automatically converted. For best results, it is recommended to use a image or logo that is already in black and white. For our cutting board example, we will be using a blue and red Cubs logo. Select **Import**, then select **Image Trace** from the menu.

From the menu that appears, choose **Upload File**. Then select **Chose File**, and locate the “Cubs Logo” file from the **Desktop** and click **Open.** The **Image Trace** menu will appear with a preview of the image. Adjust the **Threshold** and **Smoothing** settings as needed. **Threshold** changes the contrast qualities of your image, causing some details to be eliminated if the settings are too low or too high. **Smoothing** reduces sharp edges or angles so your image is easier to carve. Images with sharp corners will be more difficult to carve. For our image, we will keep the **Threshold** at 30 and increase the **Smoothing** to 1. Then select **Import**.

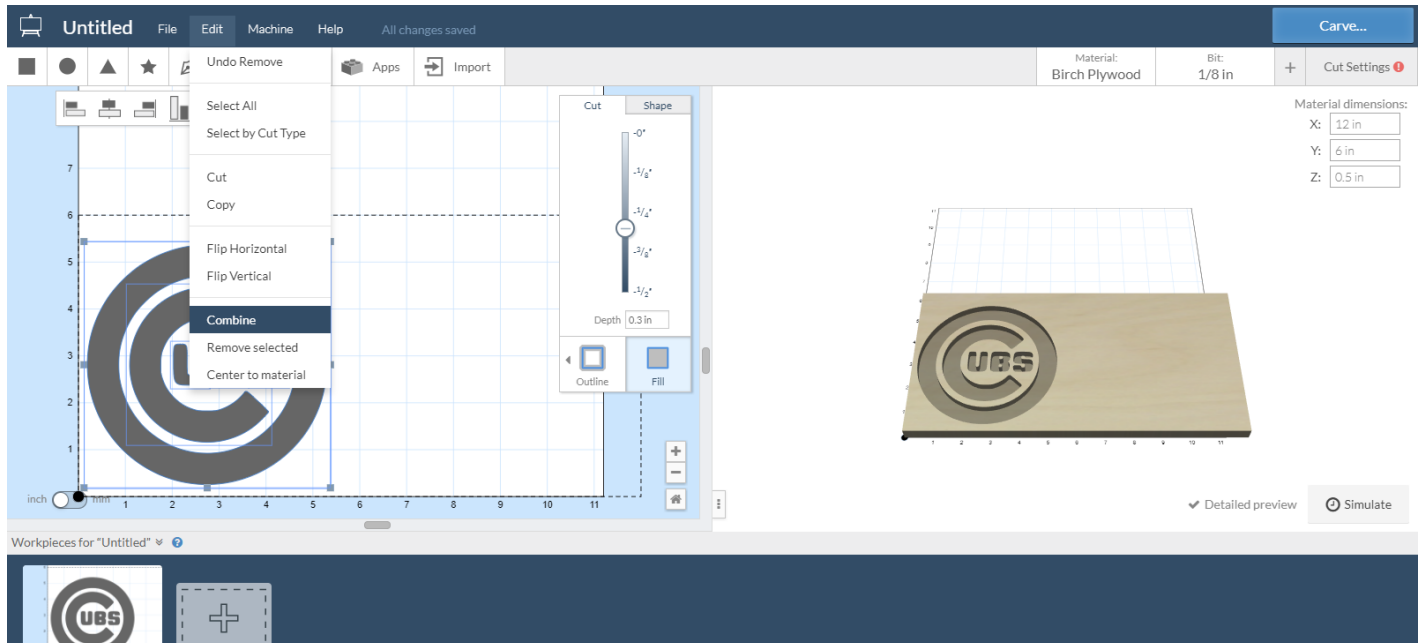
The image will then be imported into the Easel software. Often, images will be imported into multiple parts that can be moved and manipulated independently from the rest of the design.



ADJUSTING DESIGN

Combine Parts

The Cubs logo is currently divided into several different parts. To make it easier to resize and reposition, let's combine these parts into one design. With all parts selected, click the **Edit** menu. Select **Combine** from the **Edit Menu**.

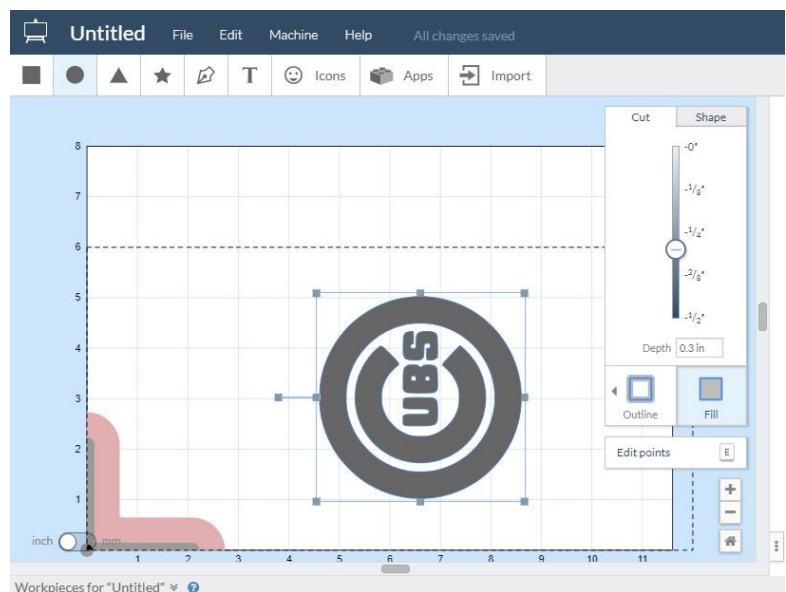


Rotate and Resize

Now that it is all one design, we can rotate the logo, resize it, and reposition it. To **Rotate**, click the blue square at the top of the design, then drag your mouse with left or right to begin rotating.

To **Resize**, click one of the blue squares, and drag inward or outward to resize.

To center, click and drag the design so the center squares align with the 3" horizontal ruler mark.



INSERT

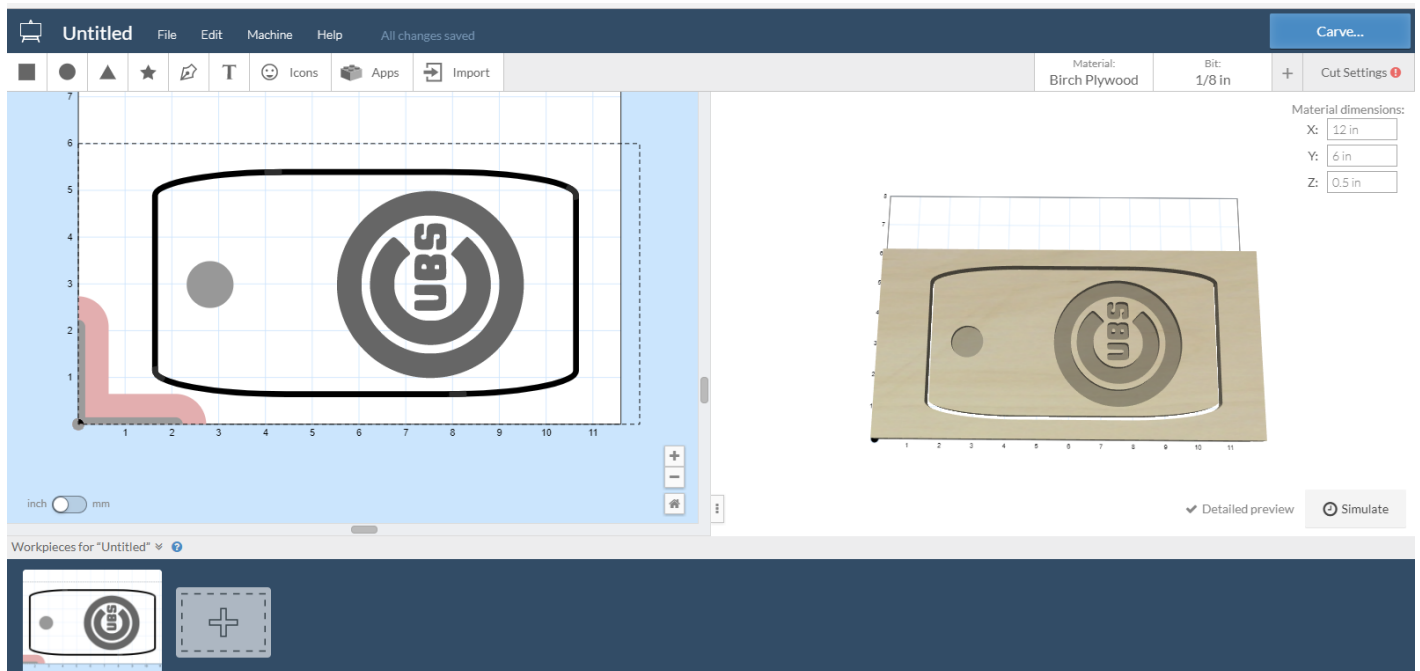
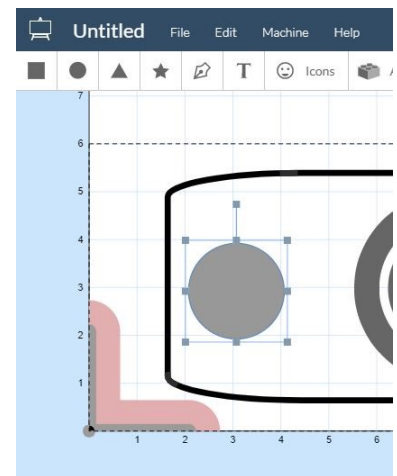
Import a SVG File

The cutting board outline can be made a variety of ways. If a rectangle or oval shape is desired, it can be created using the **Insert Shapes** option within Easel. For this class, we are going to insert an SVG file of the shape. Scalable Vector Graphics (or SVG files) can be created using *Inkscape*, *Adobe Illustrator*, or *Google Drawings*, and can be used by the Carvey (and the Laser Cutter) to cut materials to a specific size or shape.

To insert, select **Import** and then **SVG**. Chose "Cutting Board Outline" from the **Desktop**, then click **Open**. Center the outline using the 3" horizontal ruler guideline. If needed, reposition the Cubs logo.

Insert a Shape

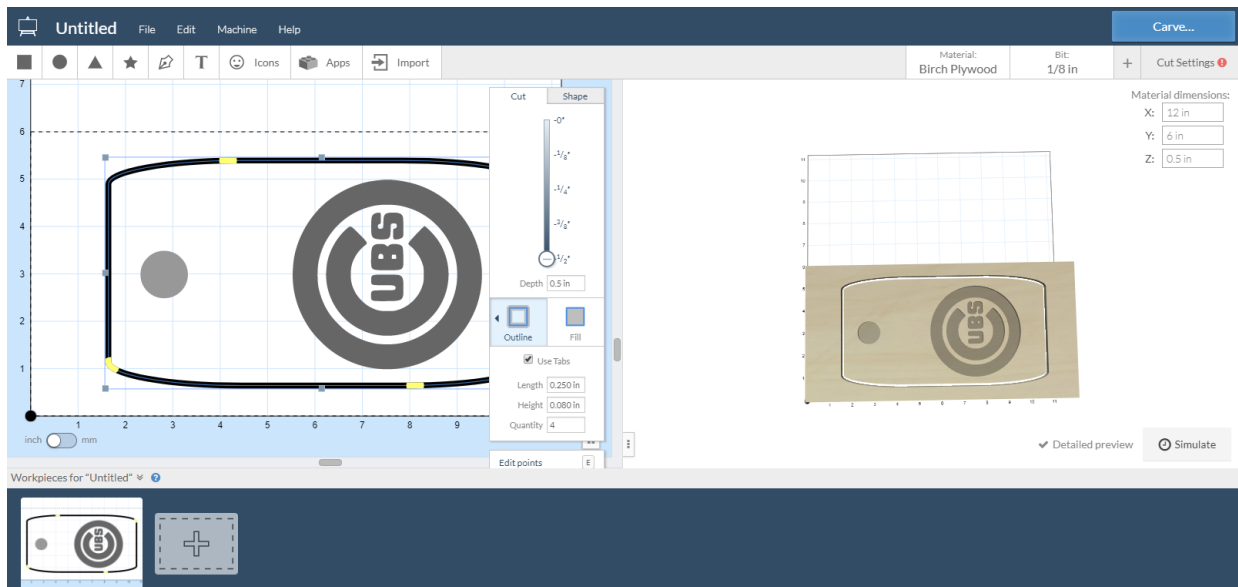
Next, click on the **Circle** icon to insert a circle. When the circle is selected, blue bisecting squares will appear. Drag a blue square from the corner inward to make the circle smaller. Use the ruler guidelines to resize the circle to 1" diameter. Use the 3" horizontal ruler guideline to center the circle, leaving about 0.5" inches from the top.



CUT SETTINGS

Cut Settings

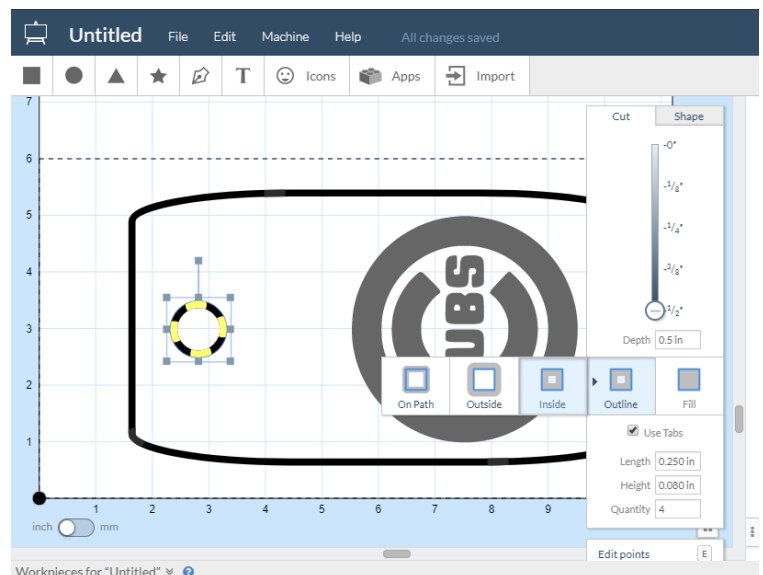
Now that we have our overall shape and design ready, let's adjust the cut settings as needed. First, select the outline. A **Cut** and **Shape** menu should appear. Set the depth to **0.5 in**, so that the Carvey will cut through the entire material to create the cutting board shape. Keep **Use Tabs** selected. The **Tab**s, shown by the yellow marks, are small sections to keep the cutting board in place while the machine is running. These will break apart after the item is cut. The preview should show that the outline cuts all the way through.



The cut settings for the circle and the Cubs logo need to be adjusted separately. Click the **Circle**, then use the **Cut** menu to set the cut depth to 0.5 in. Also, select the **Outline** icon, then choose **Inside**.

Pro Tip: When creating your design, account for the size of the drill bit. To do so, set your design to cut inside or outside the shape to create accurate cuts.

Since the inlay will be 1/16 in., set the cut depth of the Cubs logo to 0.0625 in. Choose **Fill** instead of **Outline** from the menu.

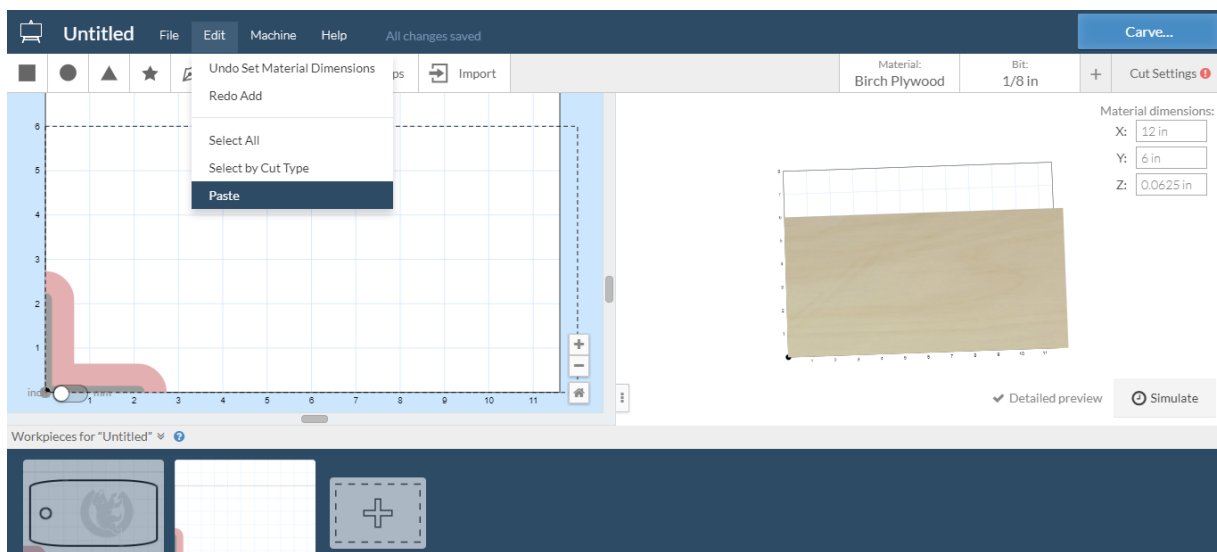
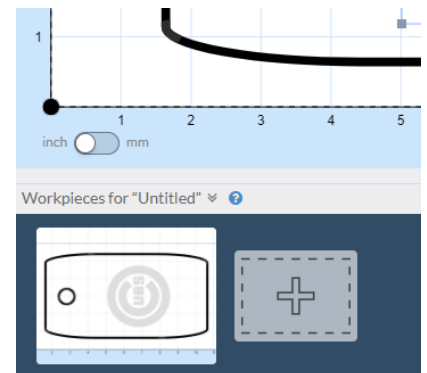


THE INLAY

Creating the Inlay

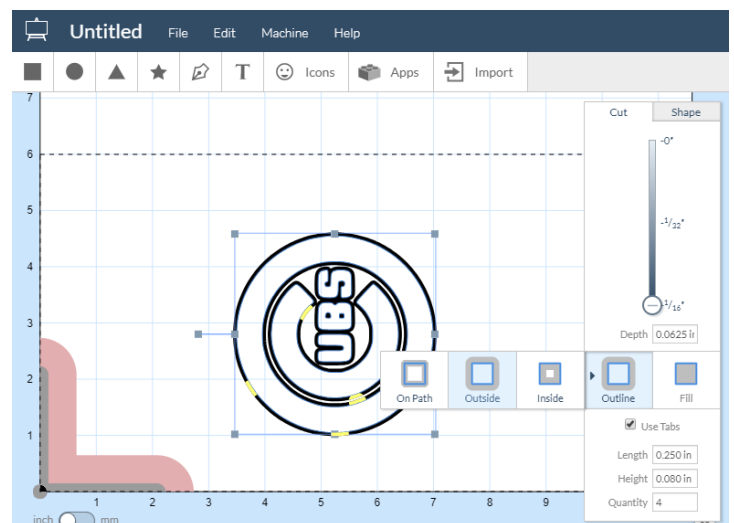
The last step to creating this cutting board is creating the inlay. In our case, the inlay will be made using a piece of wood sized 6" x 12" x 1/16". To begin, select the Cubs logo, click **Edit** and then **Copy**. Create a second workpiece using the **Plus (+)** icon at the bottom.

On the new workpiece, adjust the **Material Dimensions** according. Then, click **Edit** and **Paste** to insert the **Cubs** logo.



Cut Settings for Inlay

Select the Cubs logo to adjust the cut settings. Since this design is meant to lay into the cutting board, the machine will have to cut all the way through the materials. Set the cut depth for 0.0625 in. Also, to account for the size of the drill bit, chose **Outside** from the **Outline Menu**.



PREPARE TO CUT

Bit Size

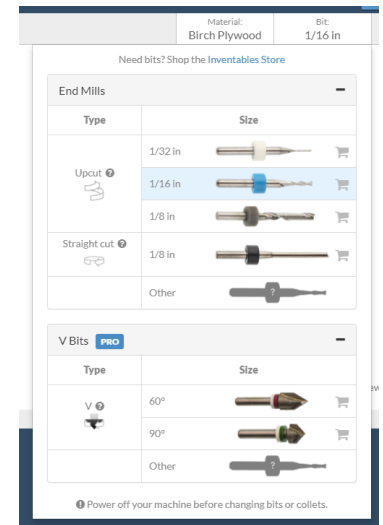
Before the design can be cut, the drill bit size and material type needs to be confirmed. To adjust the bit size, click the **Bit** icon in the upper right. From the **Bit Menu**, select the bit size you intend to use. Smaller bits are recommended for detailed designs, but take longer to cut. Bigger bits are quicker, but reduce the amount of detail.



1/8" Drill Bit



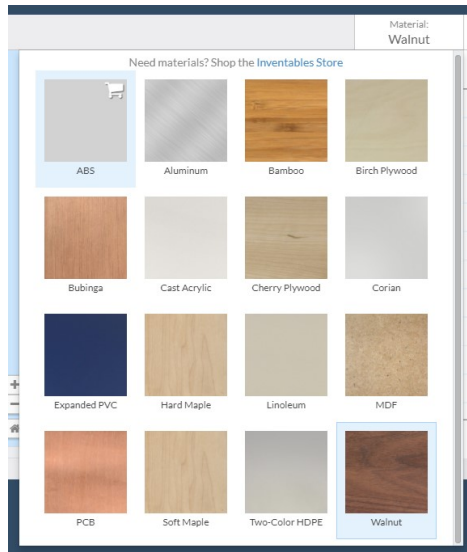
1/16" Drill Bit




V Bits are reserved to Pro Subscribers, and are currently not available in the Makery.

Confirm Material Size

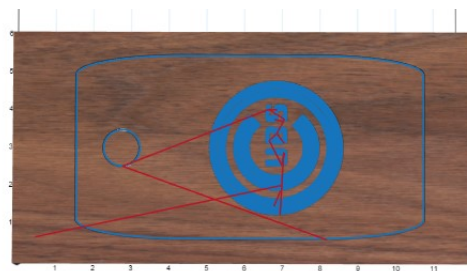
Use the **Material** icon in the upper right to confirm the material type for your design. In our example, the 1/2" piece of wood is **Walnut** and the 1/6" piece is **Hard Maple**.



Simulate Time

 Simulate

The **Simulate** button in the bottom right will simulate the cut path and time it will take to carve. For instance, the Walnut piece will take about 32 minutes. This is a great tool to help time and schedule your projects!



More Resources

For more project ideas, visit *Pinterest!* For premade SVG files, check out thingiverse.com or instructables.com.