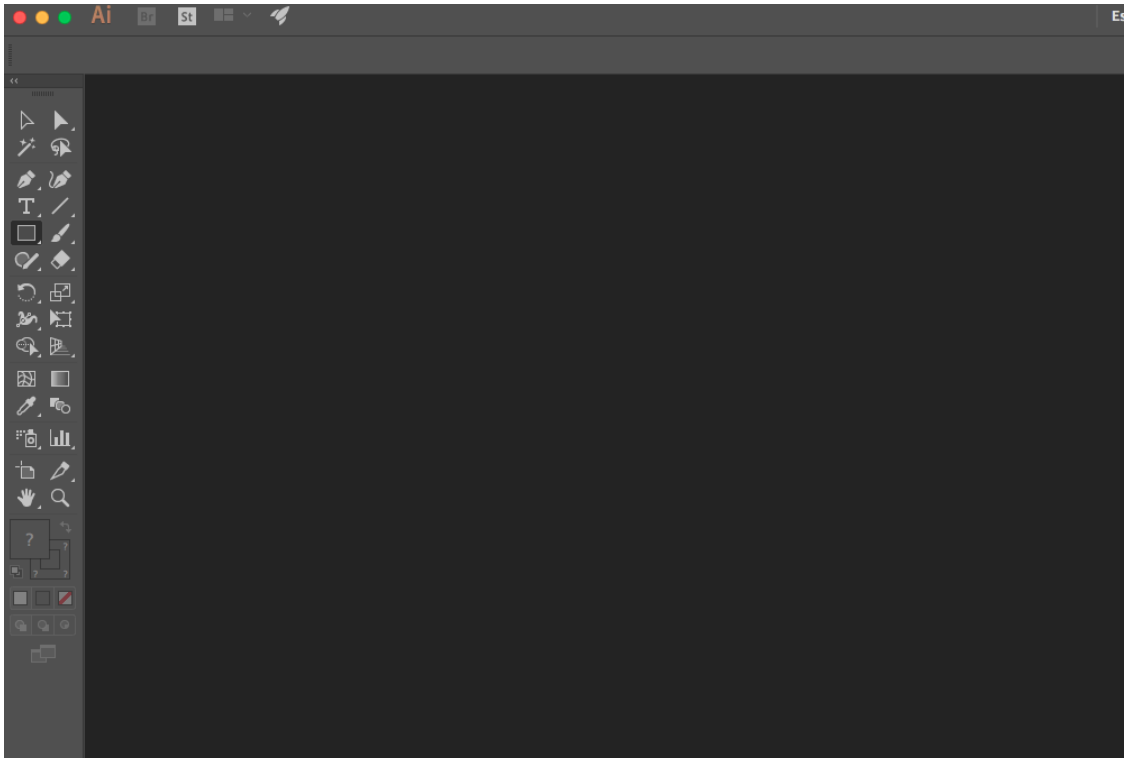
goo.gl/c6xbaP

Adobe Illustrator

Documentation by Shani Mensing

Begin by opening Adobe Illustrator 



Create a new file by heading to **File-New**
Change the width and height to be 32 x 20 for files for our 60 watt laser cutter and 40 x 28 for files for our 120 watt. You can always resize later if needed so don't worry which you choose.

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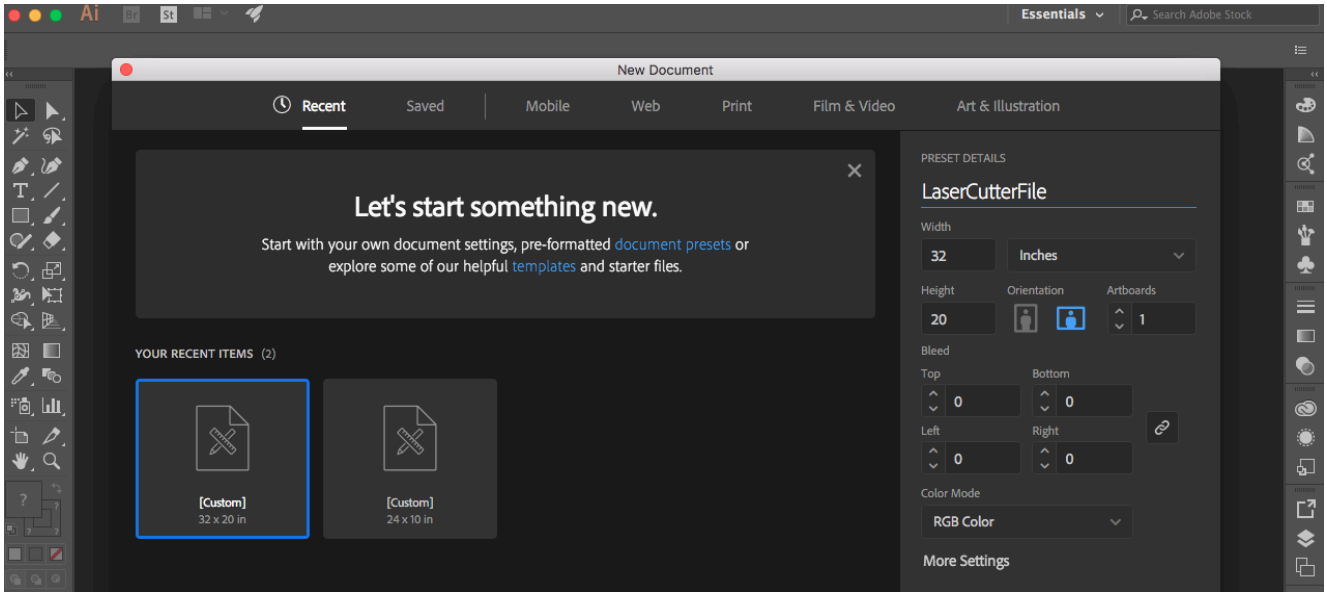
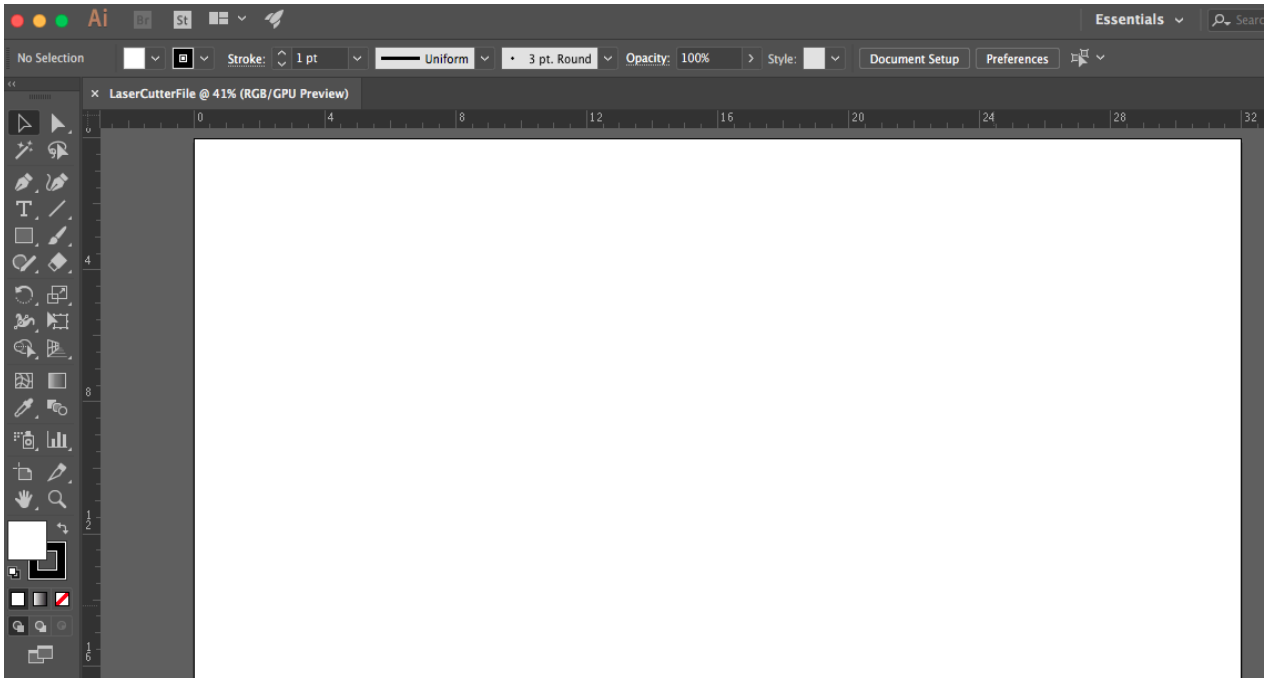


Once you select create, you will see a white rectangle with the dimensions you specified. We will refer to this rectangle as our artboard.

Hit “Command R”(mac)/ “Ctrl R” (PC) to pull up your rulers. Rulers will allow you to see how large your project is at a glance as well as provide an easy way to create guidelines.



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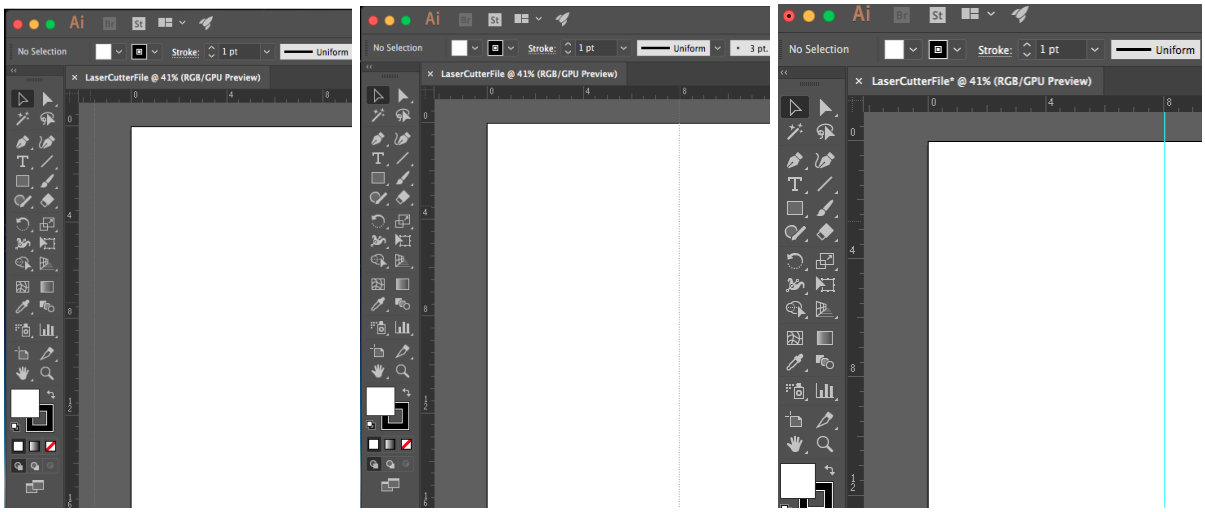
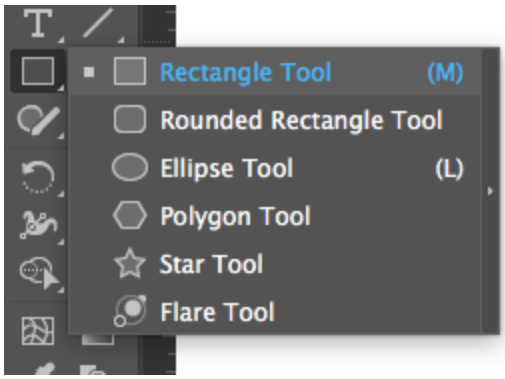
Guides

Guides are lines or shapes that we can see but is not something that would be registered by a printer/ laser cutter. In order to create a guideline you can click on the ruler and drag towards your artboard. Upon release you will have created a guideline. Guides are indicated with the color cyan.



Guidelines and Guideshapes have many useful features. They can help us keep our projects centered, aligned, represent constraints or even our material size. This is important because we wouldn't want to create a file only to realize that it wouldn't fit on our material.

Guideshapes can help solve this problem.
To create a guideshape begin by creating a basic shape. Click on the **Rectangle Tool** or any tool that best represents your material shape. To see more shape options right click on the shape tool.



Draw your shape by clicking anywhere on the artboard and then drag out to give it dimension. You don't have to worry about dragging out your shape to the exact size of your material. We will be able to edit this later.

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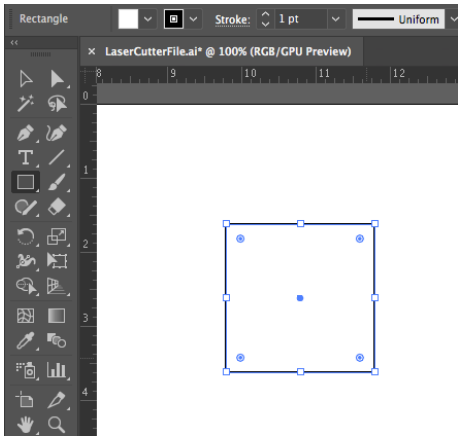
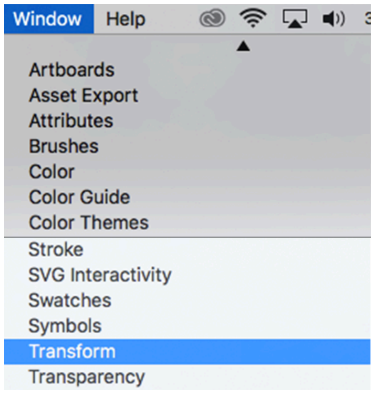
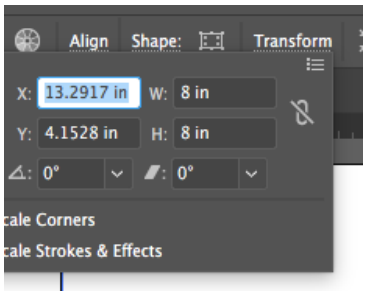
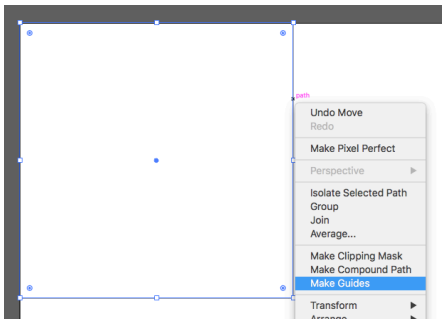


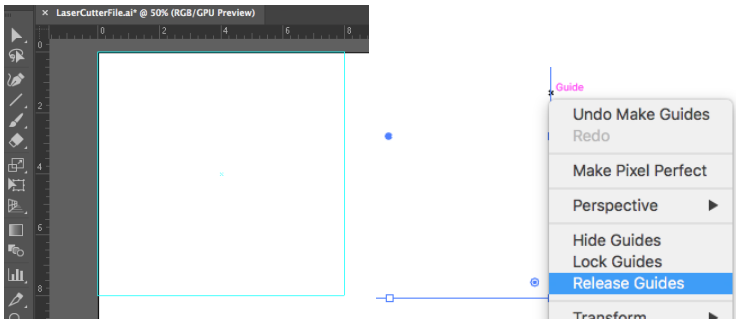
To change the size of our shape we can use the **Transform Tool**. The Transform Tool can be found either on the top right or under **Windows-Transform.** Modify the width (W) and height (H) to reflect your material size. Once finished click the outline of the shape and place the shape in the top left most corner.





To turn this shape into a guide. Select the shape, right click and click on Make Guides. Your shape will now have a cyan outline to reflect that it is now a guide.





Once a guide is created you can **Hide**, **Show**, **Lock** or **Unlock** it by right clicking on the artboard. If you ever need your guides to become regular shapes again you can select **Release Guides.**

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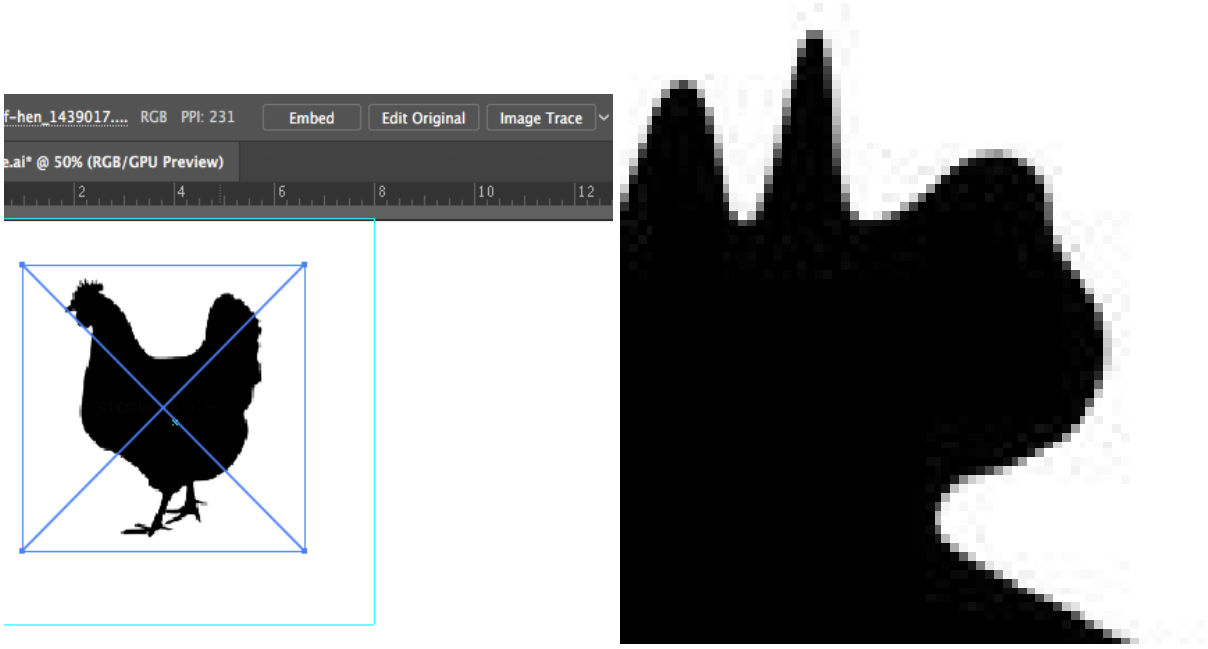
Preparing a Silhouette

Raster: Engrave

Locate a file you like online or elsewhere and save the file to your computer. Then drag and drop your silhouette image from your desktop onto your Artboard. Make sure to give credit if you are using images that are not your own.

Image Trace

If you are looking to engrave you are technically done! Sending an image like this to the laser cutter will cause this chicken to be engraved onto your material without additional steps. However, most images are made up of pixels, so depending on the resolution of your image these pixels can be seen very easily on your final laser cut product. In order to clean up this image and to be able to modify the image (including setting the image up to be cut), we will need to trace it.



*Silhouette Chicken Image: https://www.stockunlimited.com/vector/silhouette-of-hen_1439017.html

Tracing is the act of taking an image that is created by pixels, small colored squares, and turning it into a vector image or a shape made up of points and curves that are ultimately defined by a math formula.

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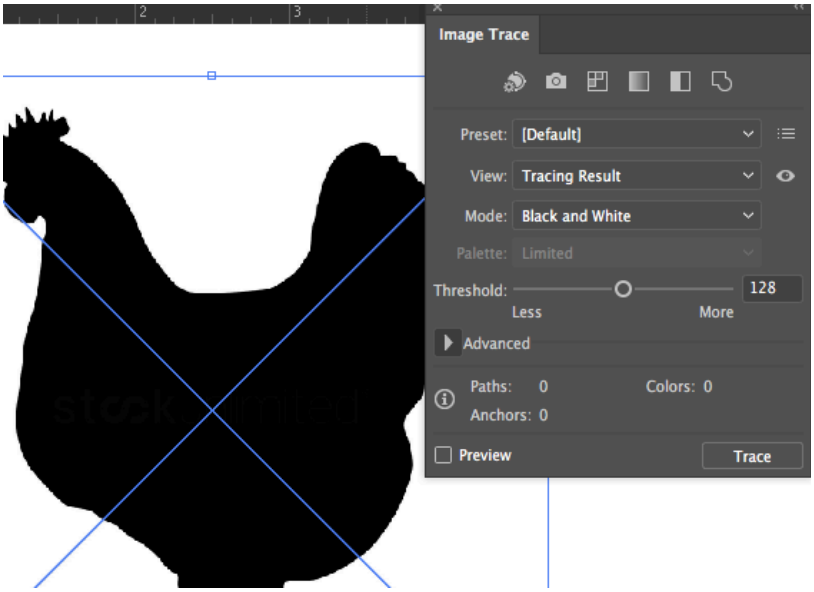
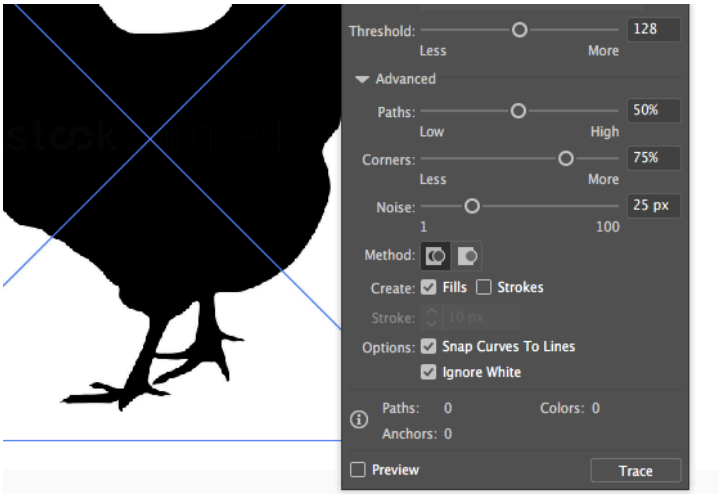
In order to modify and clean up this image we will need to turn it into a vector or traced shape.

Select the image. Head to **Windows**- **Image Trace**.

Here we have options on how we would like our image to be traced.



To start, select the **Advanced** drop down tab. This will reveal additional tools. At this point you will see the tools **Threshold**, **Paths**, **Corners**, **Noise** and an option to **Ignore White**.

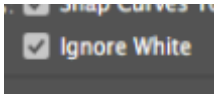


I start we always recommend you make sure to select the **Ignore White** option**.** This will get rid of the white background and make your life easier. We recommend you do this to avoid double lines.

Double lines

A good practice to make sure that there are not any lingering double lines in your image is to hit the Ignore White tab. While double lines are not both visible to you, the laser cutter will cut these

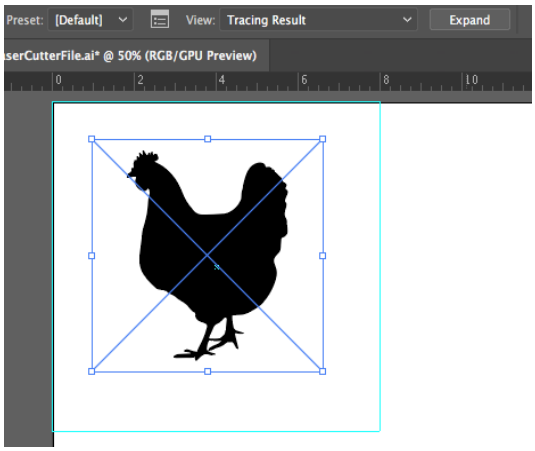
areas twice. Note that cutting the same area twice can result in a fire.



This is a common occurrence if you do not hit the Ignore White tab.

Once you have hit **Ignore White** select **Trace.**
You will see your image change from pixels to a smooth shape. If you lose some detail in your image you can adjust the settings until you have something that better represents your image.

Threshold will adjust how much white vs black is in your image.
Paths will add or subtract curves.
Corners will make points sharper or duller.
Noise will remove or add small shapes. You will not need to hit Trace again. Your image will be adjusted automatically.

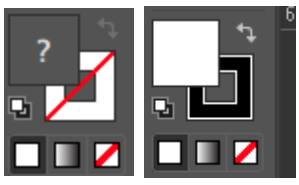


You will notice that your file has been cleaned up.

Expand

Next you will need to **Expand** your image. If **Expand i**s not visible on your toolbar go to **Window-Properties-Expand**.

**Note that if you sent this file to the Laser Cutter it would engrave a chicken into your material. However if we only wanted the outline of a chicken or a chicken cut out here are the following steps.*



On the bottom of the tool bar you will notice two squares. The filled in square represents your fill color while the outline square represents your outline color. On the lower left side of these squares you will see the default fill (white) and stroke (black). Select your image and click on the default fill and stroke.

The bottom right white square with a red line through it is for no color.
This will turn your silhouette image into an outline.

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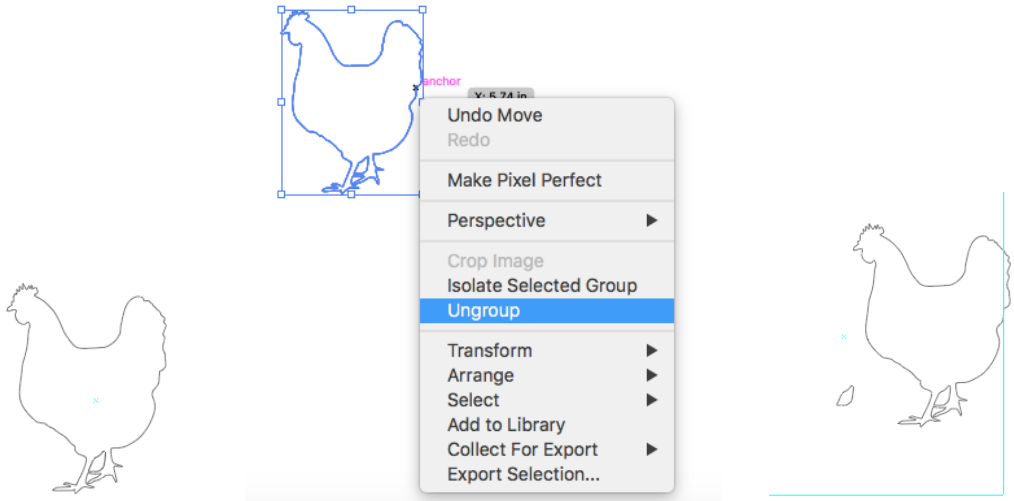
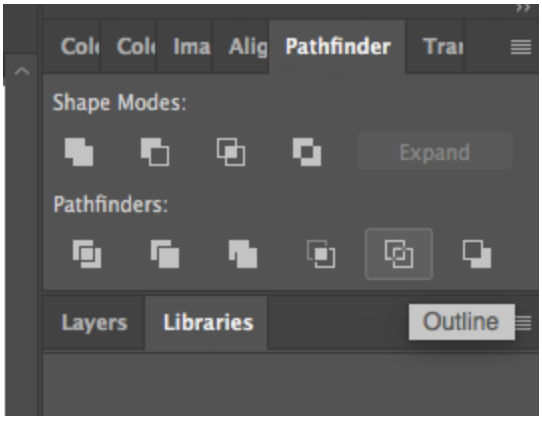
*Now you can check for double lines. Right click and hit **Ungroup**. Click and drag your image to the side to see any double lines*



Before sending your file to the Laser Cutter go to **Window-Pathfinder**.
Select your image and click on **Outline**. This will condense your file to single lines/paths.



**Sending this file to the Laser Cutter would cause the laser cutter to engrave an outline of a chicken onto your material. If this is your desired result consider vector engraving. Vector engraving will save you time when laser cutting. We will cover this below.*

The examples we have seen up till now are Raster files. Raster is the term we will typically use to refer to something that is engraving. While Raster is typically used for engraving, how deep the engraving will be is dependent on the speed and power we set our laser cutter to. We will cover speed/power settings at the end.

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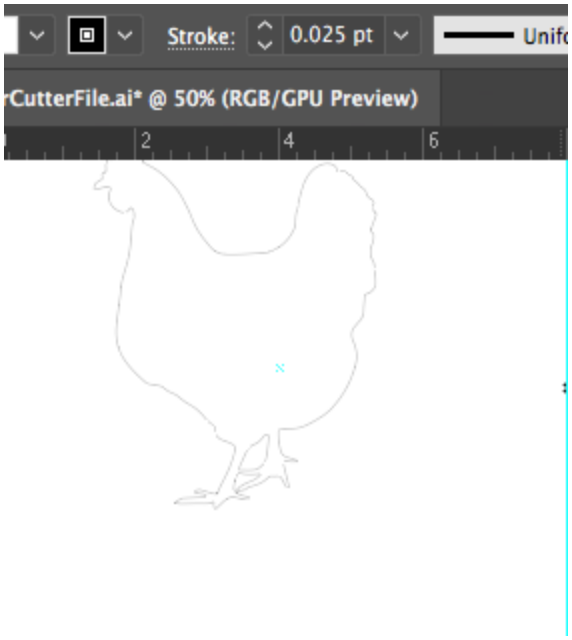
Vector: Cut (Puzzle Piece)

If we wanted to cut out our image we would have to represent to our laser cutter that these lines are Vector lines instead of Raster. Begin by Image tracing your silhouette and expand it as you did for the Raster. Then, to change a line to be read as a Vector we will need to modify the stroke width.

Select your image and modify the Stroke to **.025**. Any line that is **.025** or smaller will be recognized as a Vector and the laser cutter will attempt to cut those lines.



**If we send this file to the Laser Cutter this file would cut through the material. However how deep the cut will depend on the settings we give the speed and power of the laser cutter.*

Vector Engraving

As we mentioned, Vector lines are typically used for cutting. We say typically because lightly cutting something can appear as an engraving. This can work in our favor as engraving through Raster can take 3x longer than engraving with Vector.

If you plan to use Vector engraving, first make sure your document is in RGB format.
You can tell your file is in RGB format right after the tab that states your file name.

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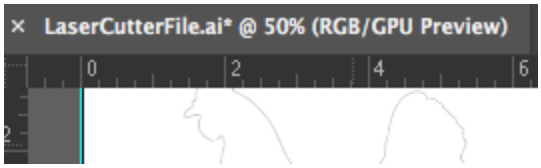
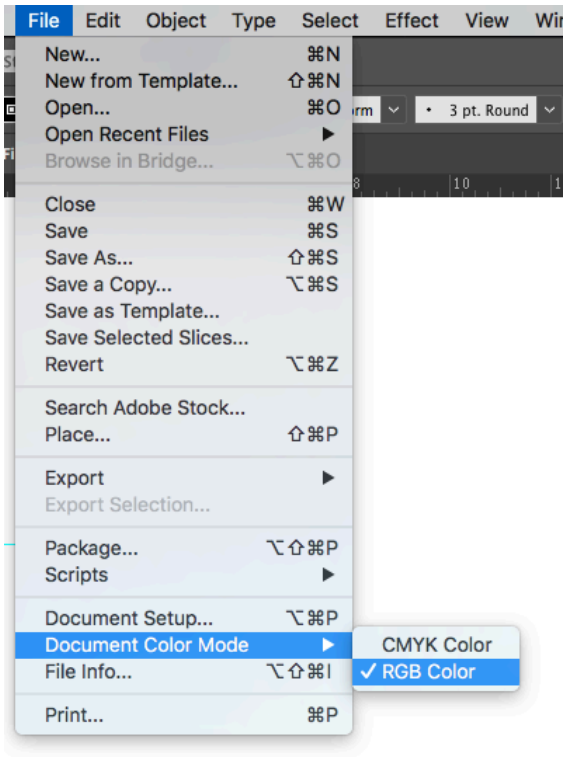


If your File is instead in CMYK you can change those settings by going to
File-Document Color Mode-RGB Color



Double click the stoke color icon and change the stroke color of the lines you would like to engrave to a color other than black. Red (255, 0, 0) is a common go to for vector engraving

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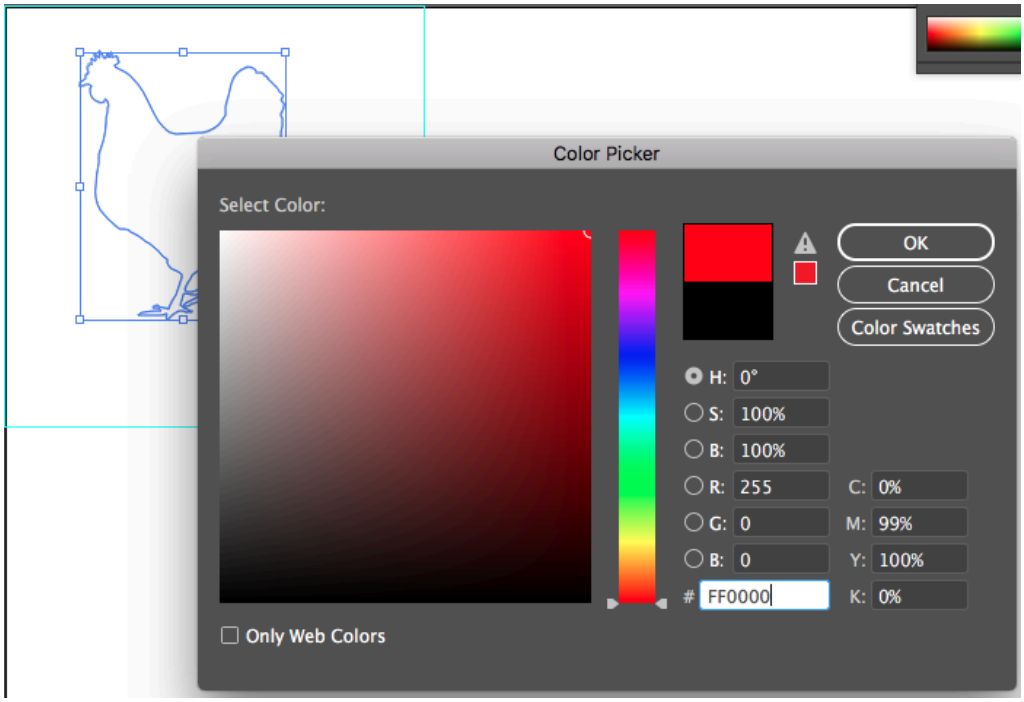

In this example I will be Vector engraving a chicken and cutting out a circle around it for a keychain.

To vector engrave we will be using the **color mapping** option in our laser Cutting settings.

Preparing Text For Laser Cutting

Adobe illustrator has a variety of text to choose from. However, outside fonts can be imported.

Click on your **Type Tool** and select the area on the Artboard where you would like to place your text. To modify your text go to **Type.** There you can change the size, and font of our text.

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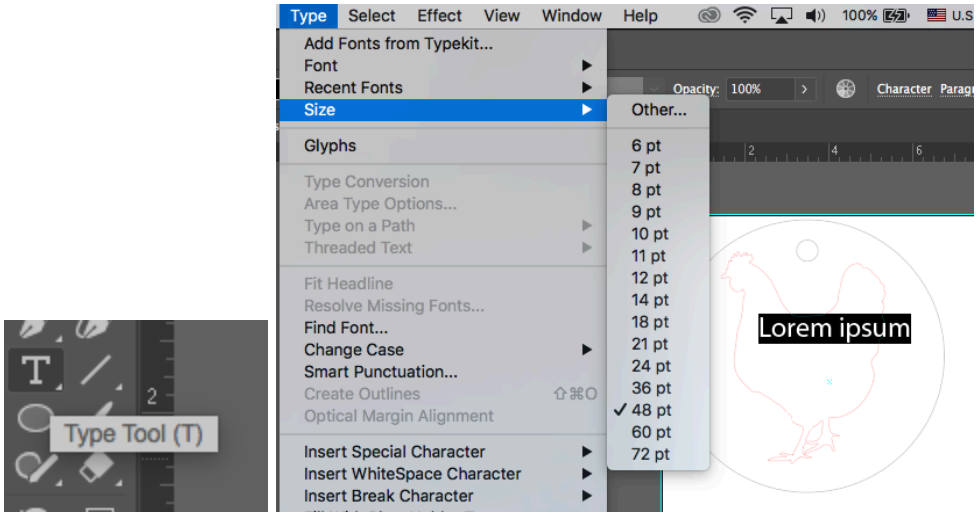
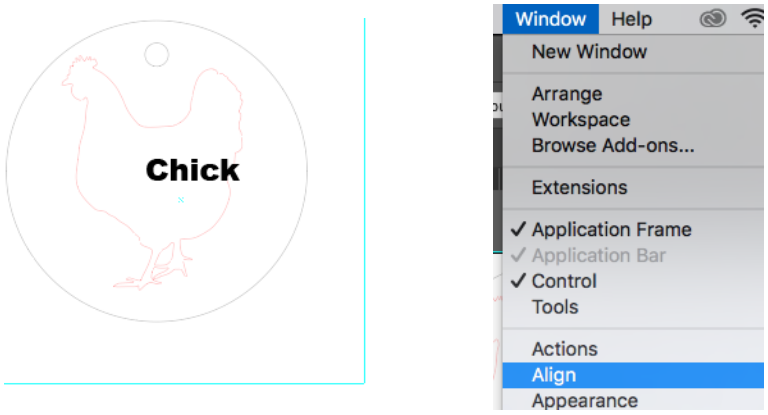


Once you have your text you can use the **Align tool** to make sure everything is centered. You can find align on the top right next to **Transform** or under **Window-Align.**



Select the alignment tool that best fits your desired look.

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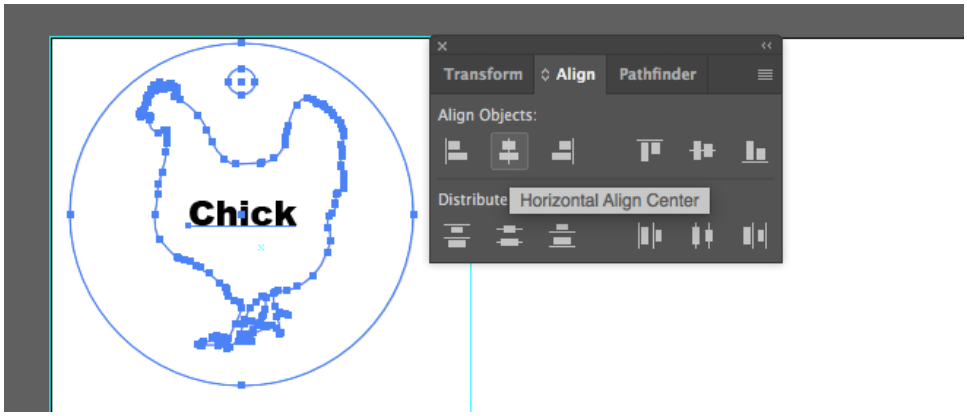
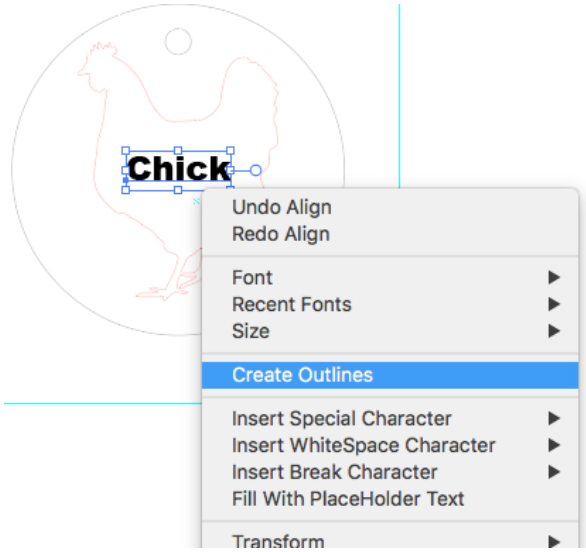
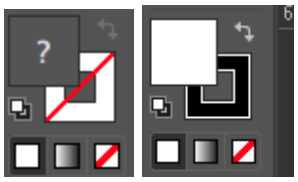


When you are finished with modifying your text, convert it into **Outlines** by selecting the text and right clicking. This will help preserve the text if the font doesn't exist on another computer. We can also further edit the text if desired.



Once the text is turned into outlines, you can change the text to only engrave the outline or to cut the text out if desired. To do this start by clicking on the text and then click on the default fill and stroke. This will turn your text into an outline. If cutting is desired change the stroke to **.025**.



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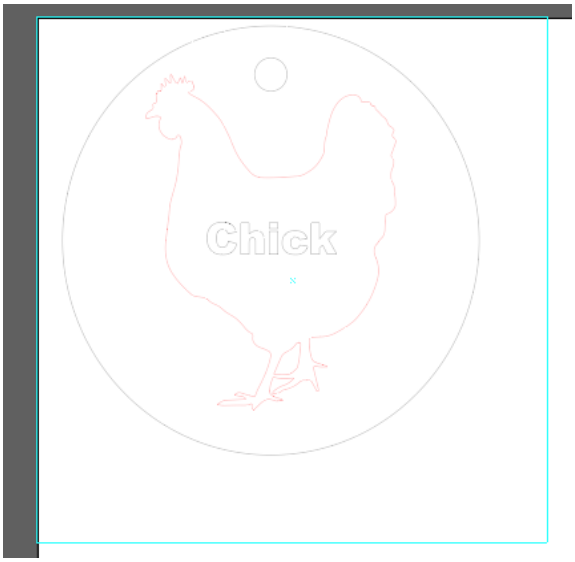

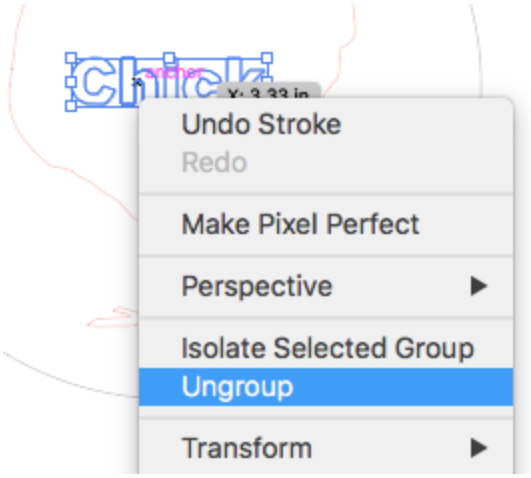

You can also ungroup text shapes and arrange them around for a different look.

Preparing an Image for Laser Cutting

Photoshop

For preparing an image you may need to turn it into a black and white file. To do this we head to photoshop.

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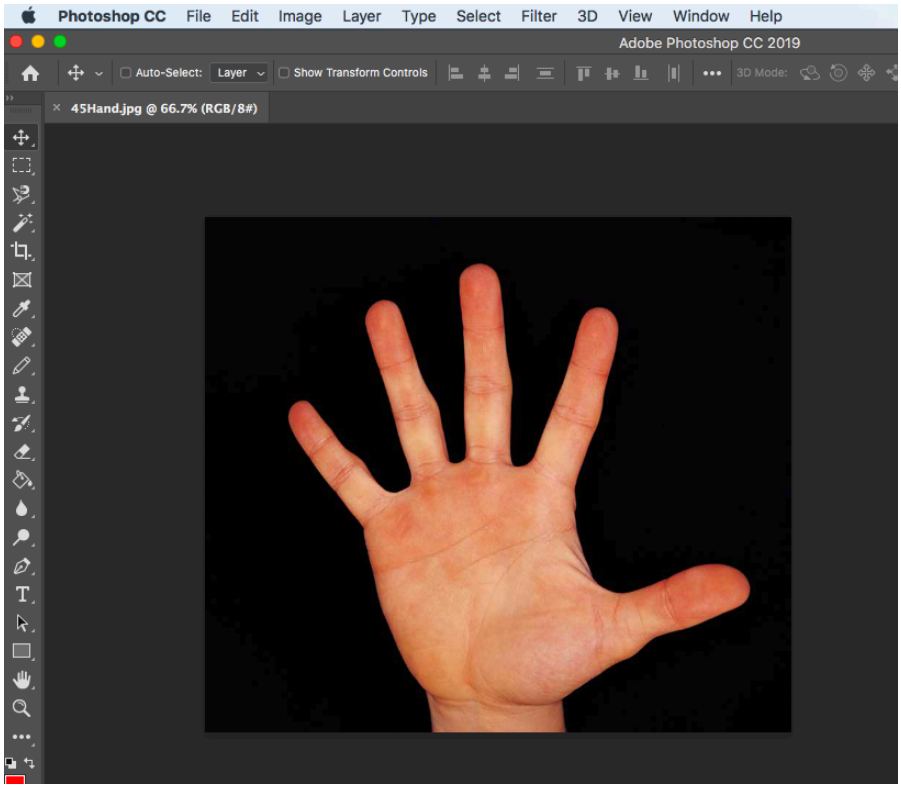

There are two ways to turn a file black and white.

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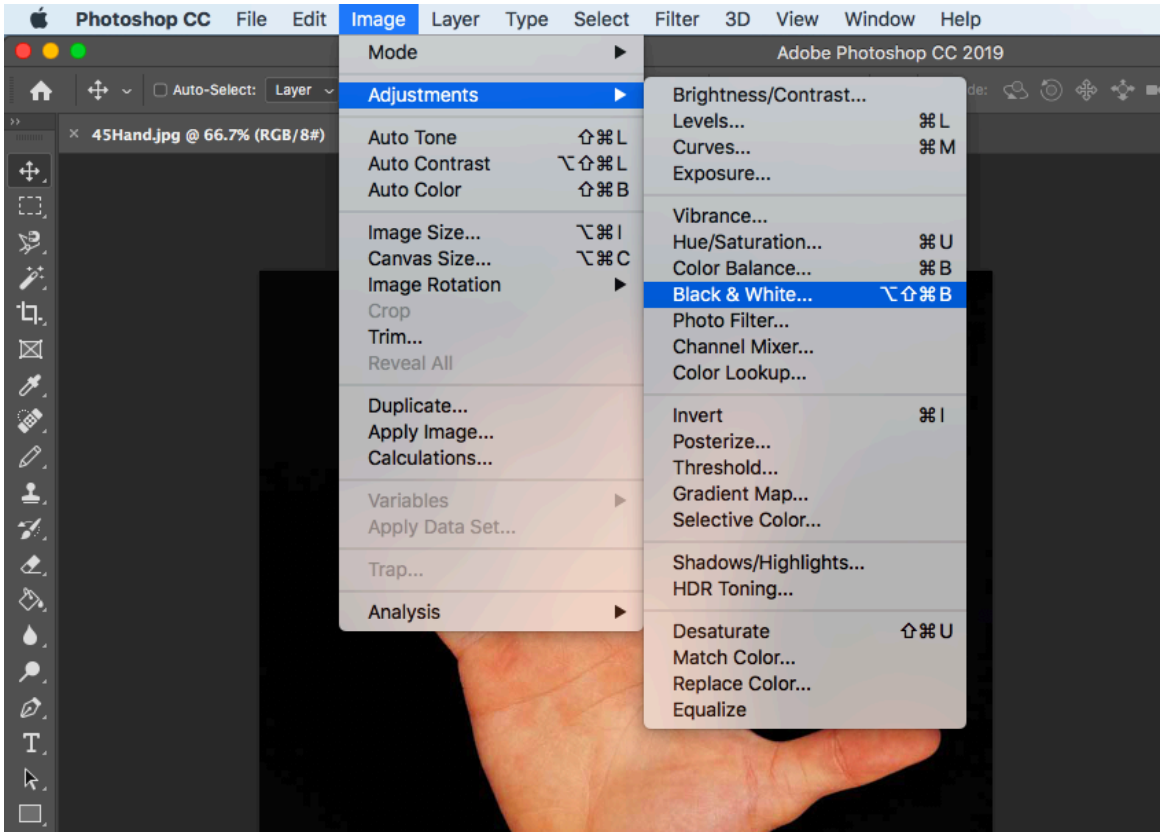
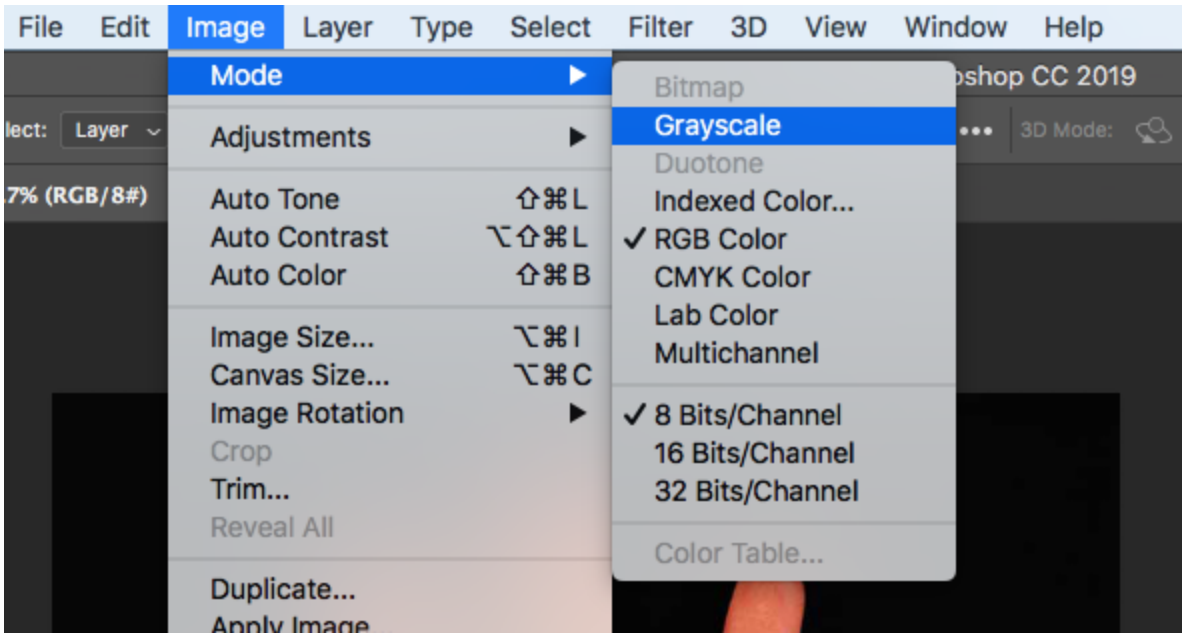
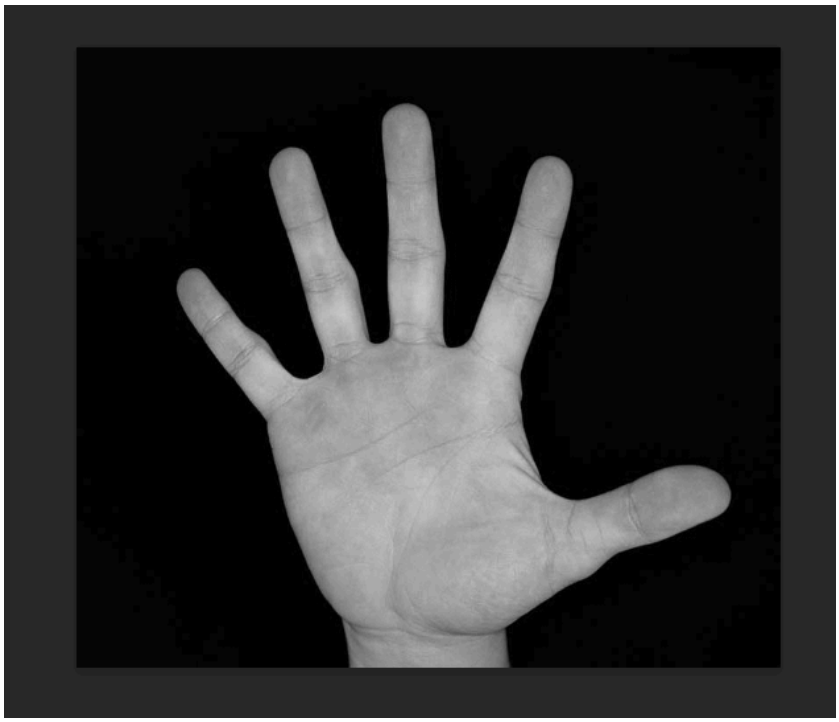


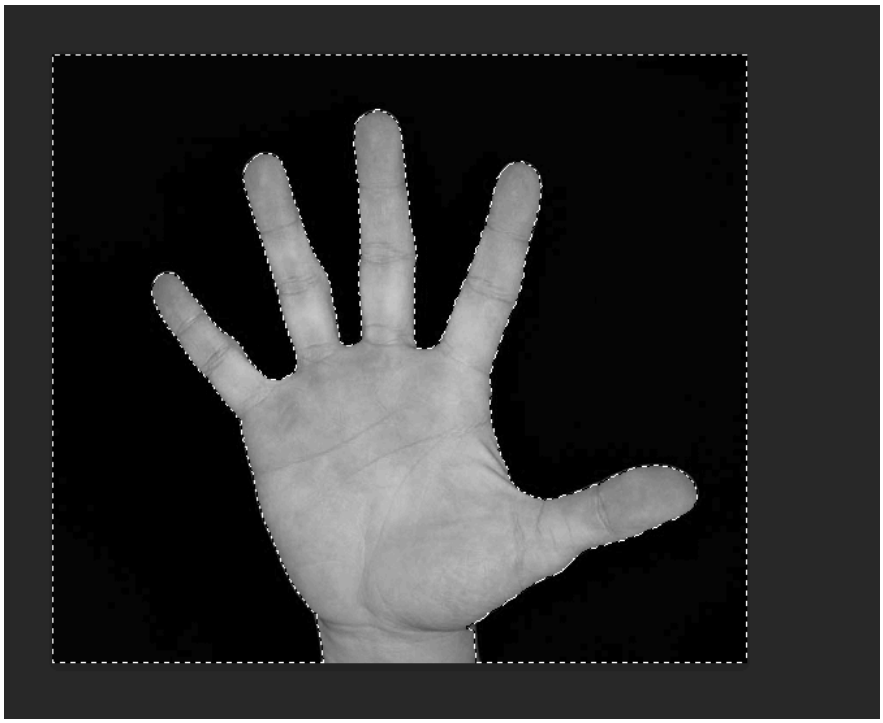
Go to Image-Adjustments-Black &White



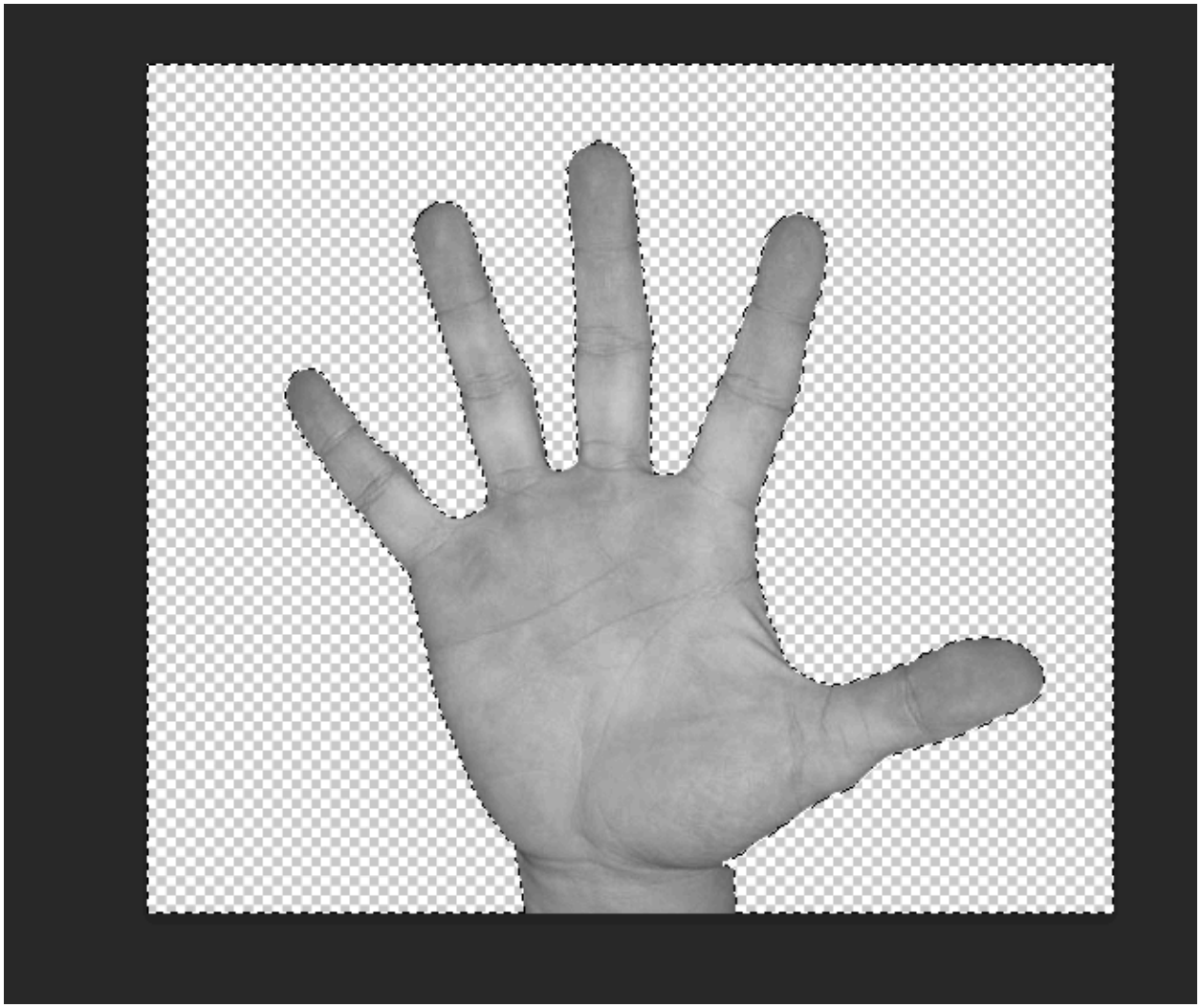
goo.gl/c6xbaP



Magic Wand Tool



goo.gl/c6xbaP



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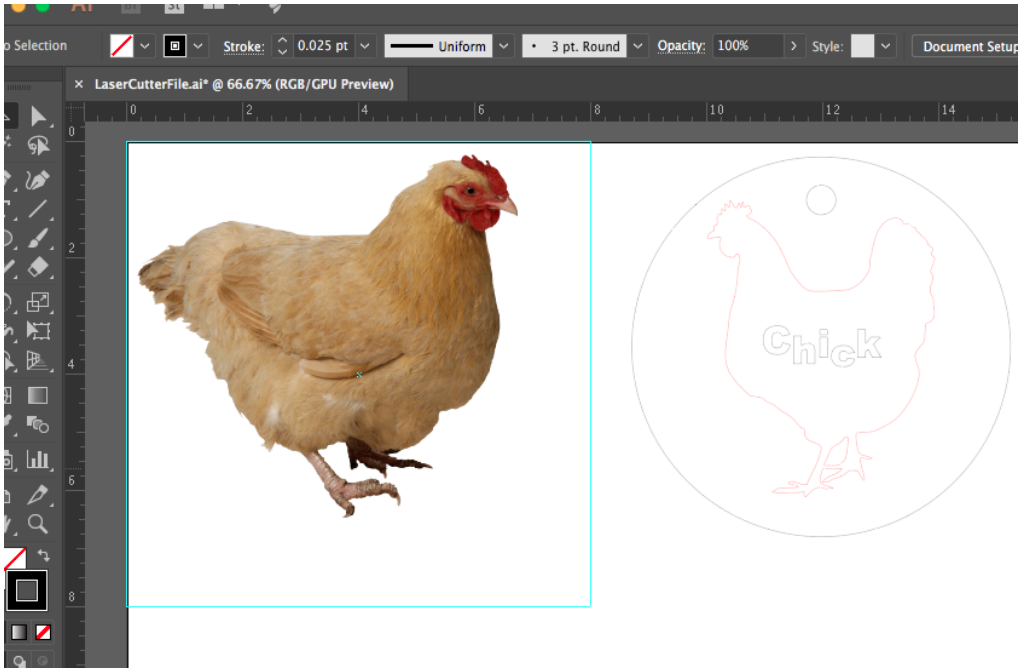
Illustrator

Or you can work directly work off of illustrator
Let’s say instead you wanted to use an image instead of a silhouette.



Please note that using images can be a bit more of a challenge. So start simple and work your way up when you are comfortable.

Like with our silhouette file we will begin by tracing our image. Instead of selecting Image Trace click on the “ v ” drop down button to see the other Tracing Presents.

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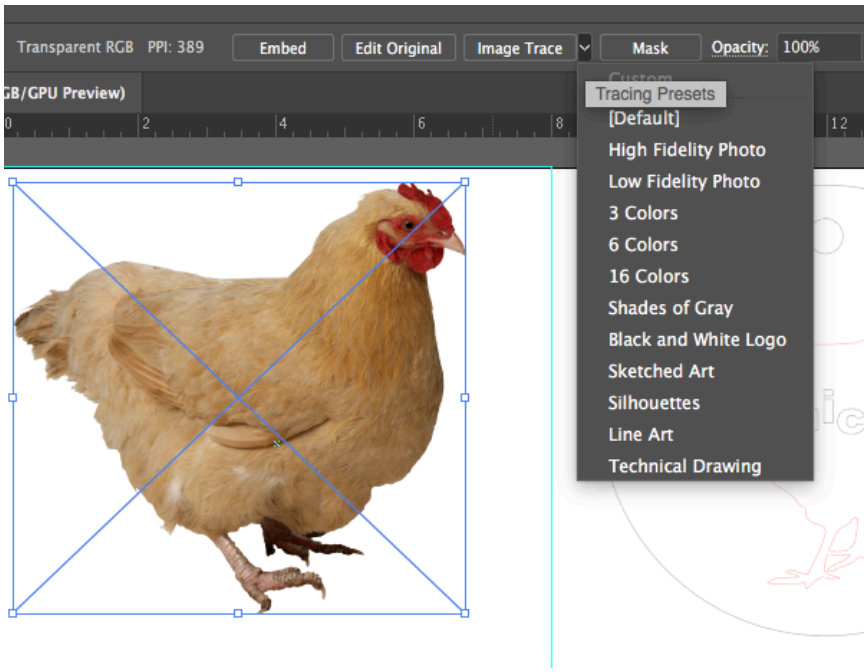

Feel free to explore with these options. The silhouette button allows us to transform any image into a silhouette. This can be very handy if you are looking to create outlines of an image. Let's say for this project we are hoping to keep some detail from our chicken. We can instead posterize the chicken. We can select 6 colors to get a great print look from our chicken. However if you have looking to actually create a print of this chicken 6 is a lot of colors to work with. I would recommend starting with 3 colors.

You will notice that your chicken will have 2 colors plus the background giving your image a total of 3 colors. You may decide that 2 colors is not enough and would like 3 colors on the image. In this case we would need to increase our colors by one.

To do this we can go to our **Image Trace Panel** located on the top left side of the artboard or under **Windows-Image Trace.** Here you can modify how many colors are to be added to the trace. Note that the more colors you add the more challenging the project.

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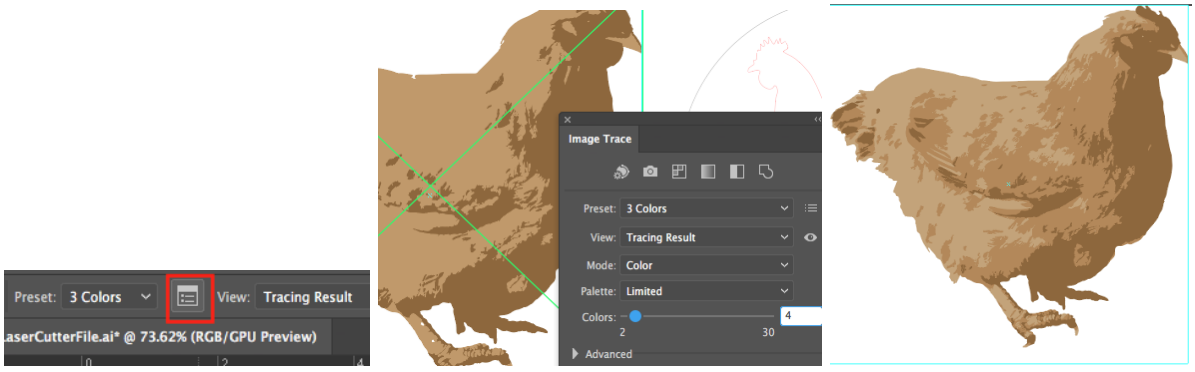
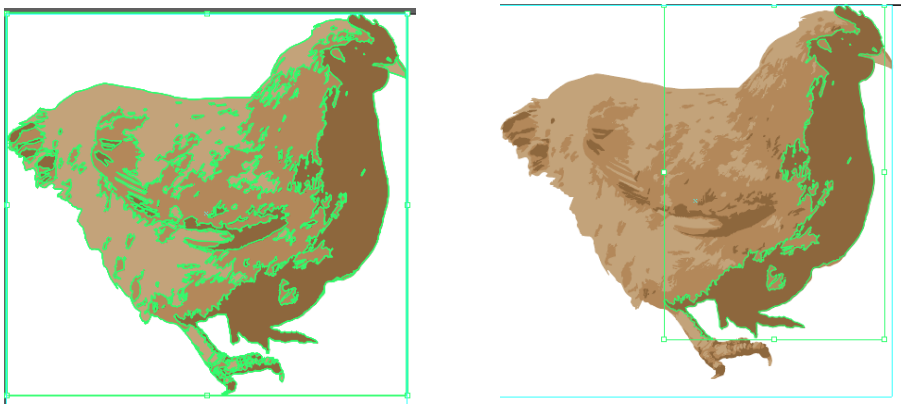


With 4 colors selected our image now has 3 colors. Next we will expand our image. This will cause a break the link to the path and select each color manually. Next ungroup your image.



Small shapes can be hard to work with and we recommend combining them to a larger shape if possible. We can do that by selecting our entire image and using the **Shape Builder Tool.**

Hovering over the image you will notice each shape greys over. Click on a shape and drag your cursor to connect all of the desired shapes.

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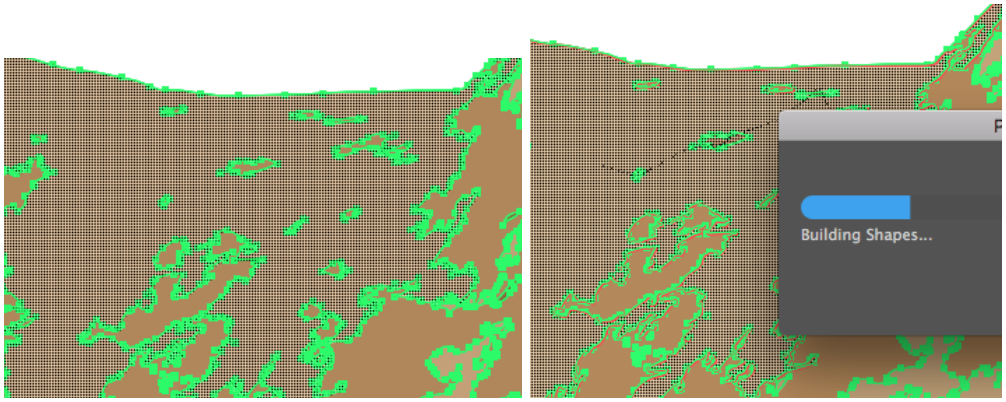
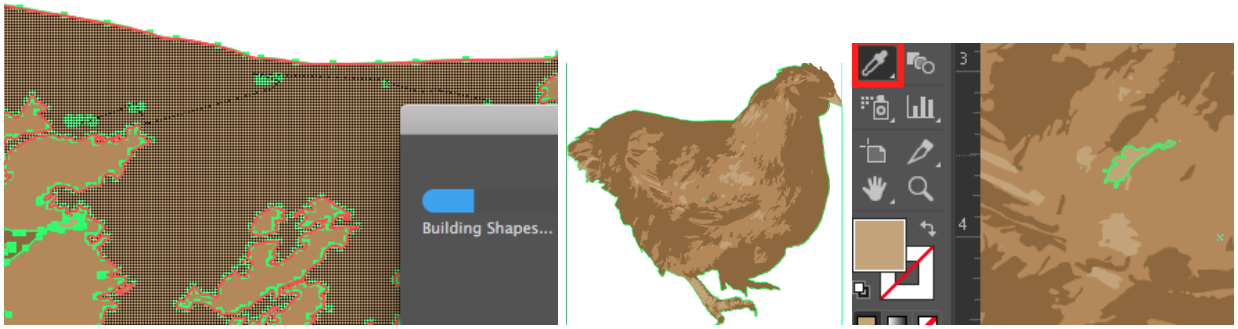
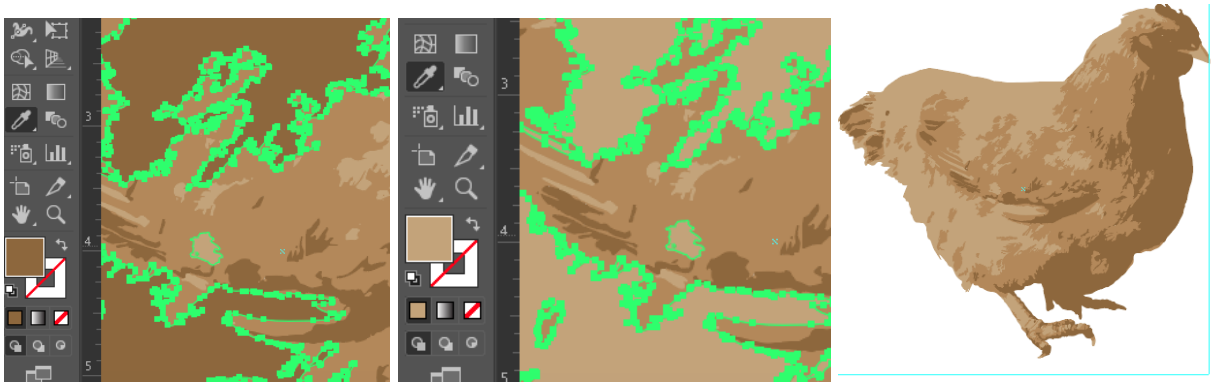


Sometimes during this process your shape color will change. To fix this we can use the **Eyedroper Tool.** Select the shape who color you would like to change and then use the Eyedroper to select the color on the artboard you would want your shapes color to become.





Repeat this process until you have an image your comfortable working with.

Here is the image before and after this edit. Notice how most of the smaller hard to work with shapes have been combined.

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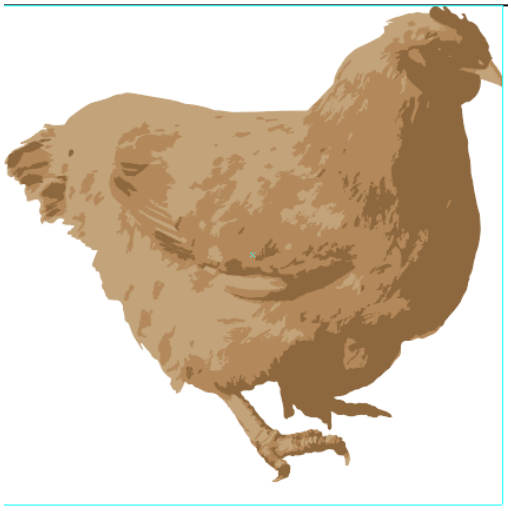
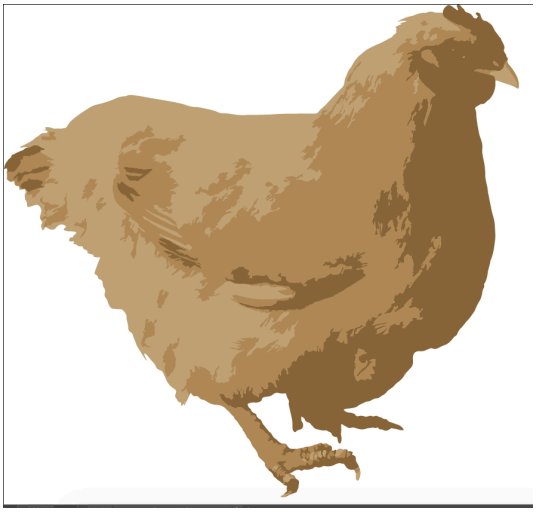
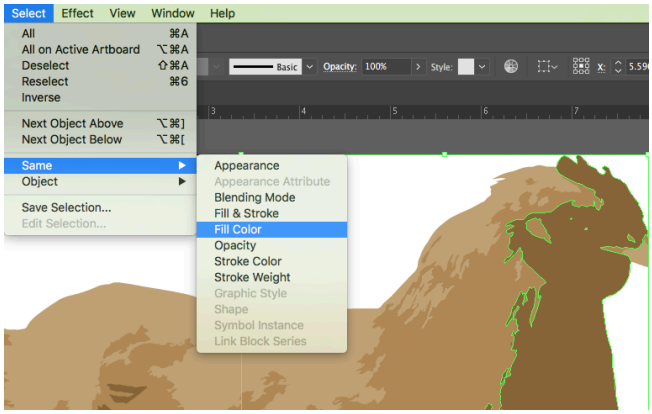
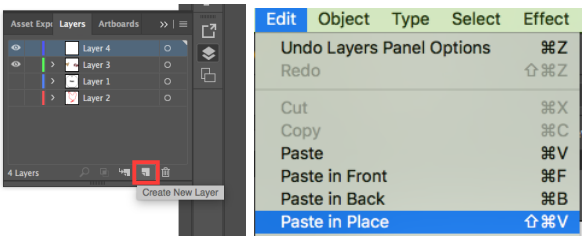




Next to keep us organized we can split these colors in to different layers. Do do this we will start by selecting every shape with the same color fill as the shape you have selected.
Go to **Select-Same-Fill Color.** And cut those shapes out.



Create a new layer by going to **Window-Layer** and hit the icon highlighted in the image. In the new layer paste the shapes in place by heading to **Edit-Paste in Place**



After separating the shapes you can prepare them to be cut with the laser cutter by converting them in to .025 lines as we saw with the silhouette example.

**Note IF you are creating this to make a print! Don't forget to reflect your image.

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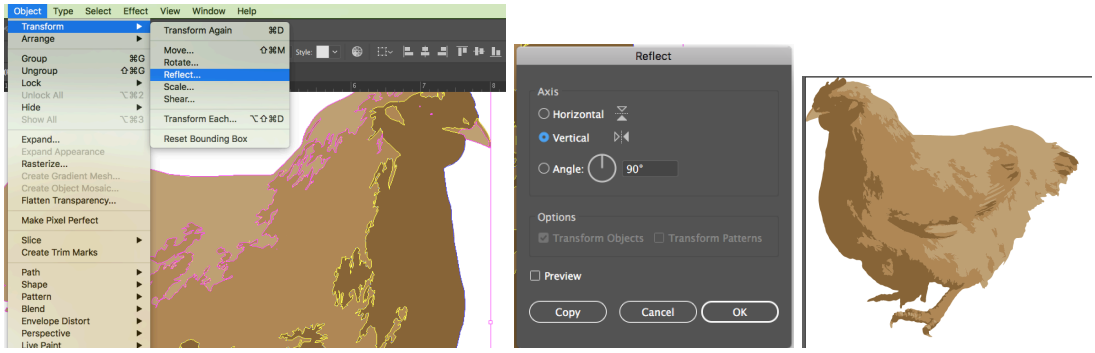
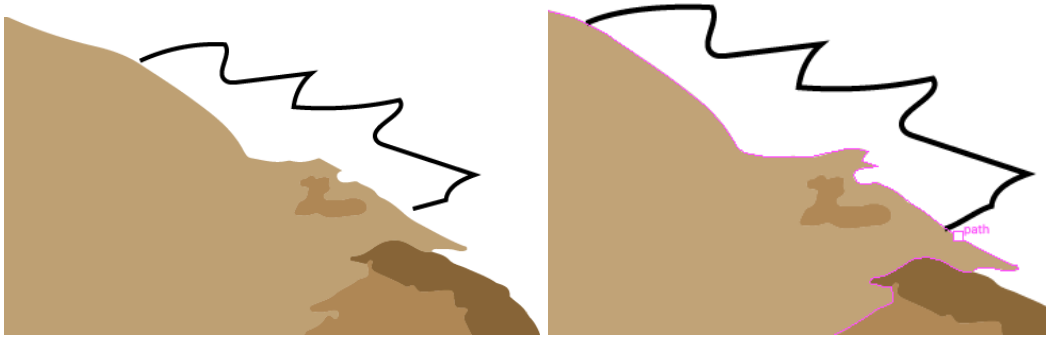
Go to **Object-Transform-Reflect**



Pencil

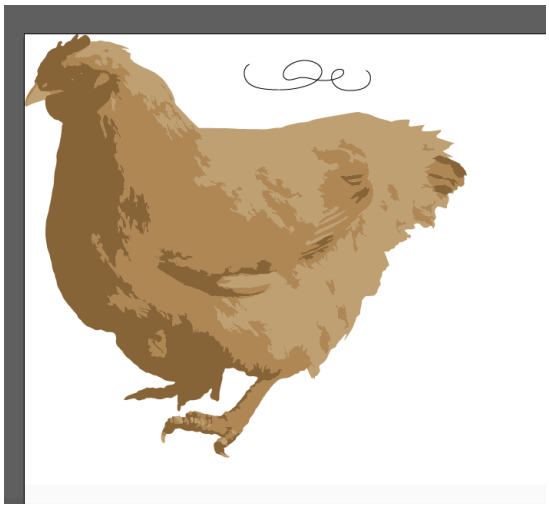
You are also able to free draw in Illustrator.
In this case I added a shape to the image.

However you can notice that the shape didn't line up with the image. You can use the direct selection (grey/white) cursor  to drag the ends of the shape to the image.



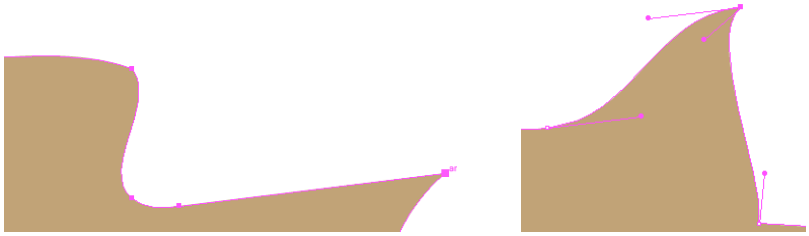
goo.gl/c6xbaP

ake the line of the new shape transparent and then use the shape builder tool to combine it to the image.

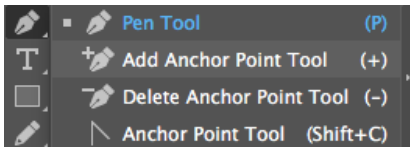


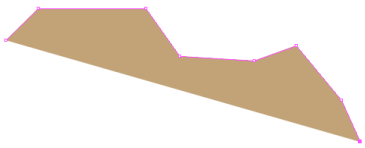
Pen Tool

When you are on the direct selection cursor you will notice small vector points appear in the image. You can move these points individually with the cursor. When selected you may also notice that these vector points each have their own wings on both sides.



These wings allow you to be able to modify the curve of the point.
The Pen tool allows use to create shapes where we have more control on where these points are created.





We can also use the pen add anchor or delete anchor to remove points we don't want in our image.