Project Description:

How to design, laser engrave and laser cut a rubber stamp.

In this tutorial, we will be using Adobe Illustrator CS6, SolidWorks, Corel Draw and LaserCut 5.3 from Rabbit Laser USA. There are other software options, like, Corel Draw, AutoDesk Inventor and AutoCAD. Alternatively, free or shareware software applications that can used is DraftSight from SolidWorks or InkScape.

About Rubber Stamps

1. What is a rubber stamp?
   A rubber stamp is means to quickly and simply transfer a design to paper, fabric, wood or any material that stamp ink or stamp pigment can adhere.

2. History of Rubber Stamping? Reading Exercise

Chicago Tribune
U.S. Rubber Stamp Industry Still Busy Making Its Mark
April 10, 1986|By Bill Barnhart.

It`s not the ``yes`` man who celebrates the rubber stamp.

An indomitable band of entrepreneurs, the kind who put the small in small business, is marking 1986 as the year of the rubber stamp.

Out of their modest headquarters in a second-floor office at 708 Church St. in Evanston, the Marking Device Association is busy orchestrating its 75th anniversary. And they aren`t shy about it.

``We`re fully aware that nobody knows what the hell `marking device`

means,`` said Thomas H. Brinkmann, the association`s executive secretary. The rubber stamp has a unique and proud history, and it`s still the cheapest custom-made product you can buy, he said. And, no, he`s not worried about the rubber stamp going the way of the buggy whip. He said 50 million stamps are sold each year.

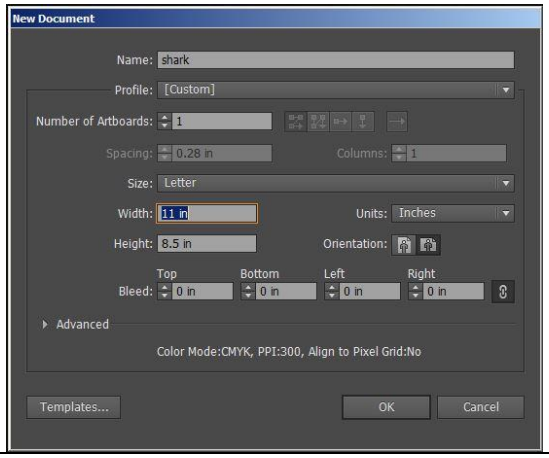
With a heritage that dates to prehistoric stencils and seals, the modern rubber stamp owes its origin to Charles Goodyear. In 1839, Goodyear figured out how to vulcanize rubber using sulphur and heat to make it resistant to cold and heat. The first rubber stamps were made in dentist offices because dentists wereq16an

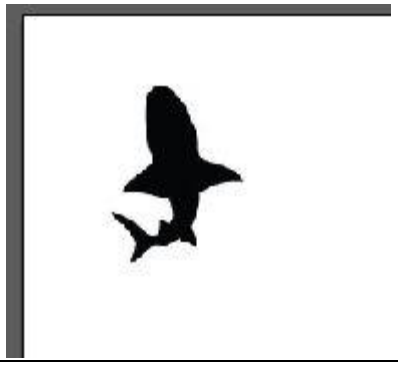
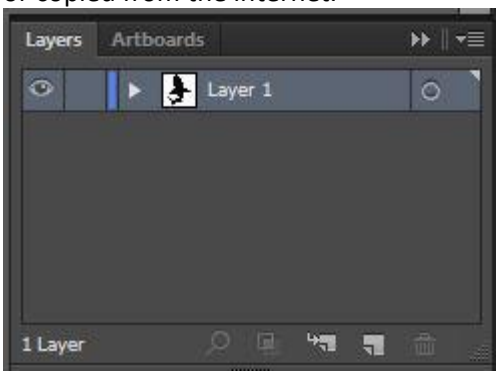
	years old in November. ``I find more young people entering the business today,`` Gondela said. ``They don`t have to come up with a large investment other than their time and knowledge.`` Many firms intentionally stay small, with just two or three employees, to avoid government regulations. However, even this bastion of independence and low overhead faces Japanese imports. A firm called Shachihata advertises its ``X-Stamper`` on national television. The device is sold through dealers, though, including many small stamp shops. ``It`s a high-tech kind of industry,`` said Melvin M. Gusdorf Jr., whose Baumgarten Co. is a leading supplier of stamps in Washington, D.C. With some justification, stamp men, as they still call themselves, scoff at the notion of the paperless office. They argue that computers have increased the use of paper and the need for simple identification devices. _____ **3. Growth Industry?** Craft Stores, like Michael's and Hobby Lobby have dedicated 1 to 2 aisles for the growing Rubber Stamp craft. This is being led by the new and growing hobby of scrap book making and people wanting to get into the new field of the homemade manufacturing trend. With the advent of Ebay, Amazon and Etsy many people are entering the industry. Ebay currently has over 150,000 rubber stamp products listed. Amazon has over 76,000 product listings on it's web site. ETSY.com has over 68,000 listings for rubber stamp products, artwork and supplies.

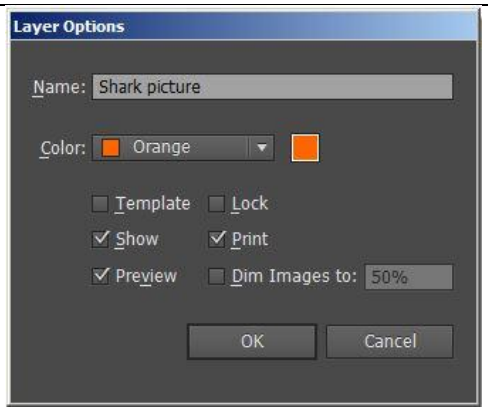
Supplies & Tools:	1. Adobe Illustrator 2. SolidWorks 3. Corel Draw 4. LaserCut Software (this tutorial uses Laser Cut 5.3) 5. Scrap wood 6. Old Mouse pad 7. Rubber Stamping Blank from craft store 8. Ink Pad from a craft store.

	9. Silicon Adhesive from a home improvement store (Lowes or Home Depot) 10. Utility Knife 11. Acetone 12. Ear Swabs 13. Band Saw 14. Drill or Drill Press

Material Sources:	

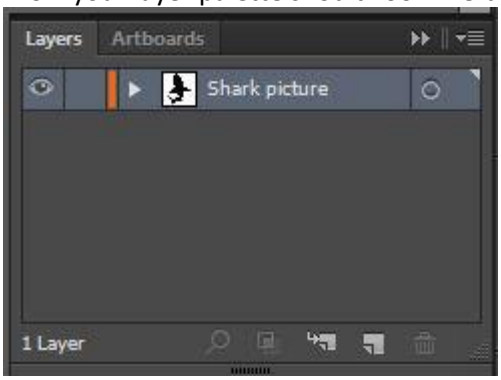
Step 1:	Find an image from the internet you would like to convert into a Rubber Stamp. It is best to look for monochromatic or single color images, icons or artwork. Below are some sample images from the internet that would make a great rubber stamp. 
	Black and white images work best for creating rubber stamps. Alternatively, is to design your own unique design, which is better and more creative.
Step 2.	Save the image in a new folder called, Rubber Stamps.
Step 3.	Open Adobe Illustrator CS6.
	Create a new file with a width of 11” and a height of 8.5” and set your units to inches. Enter a name for the file in the Name: field. Select OK. See the image below. 

	Open this image in your web browser and save as shark_001.jpg  http://www.richardplatt.net/training/shark_001.jpg
Step 5.	Select the pull down menu File> and then the Place> command. Locate your black and white image you selected from the internet (shark_001.jpg) or created on your own. Here in the image below I have placed my shark image in the upper left corner of the document. 
Step 6.	Next create a new layer in the layer menu on the right tool panel. Select the layers icon to retrieve the layers.  Your layer should look like the one below, but with your placed image you either created or copied from the internet.  Double click to right of the word Layer 1, to rename the layer Shark picture as shown below.



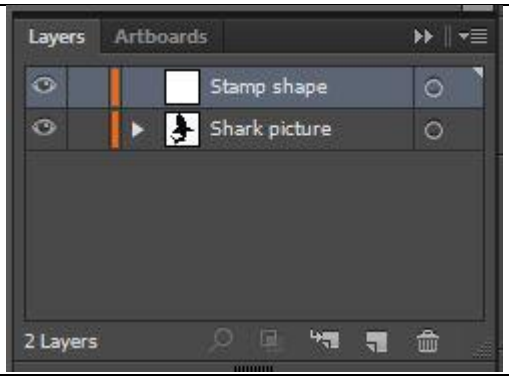
Since the image is black and white, change the high Color to orange as shown above. This makes it easier to edit the image if necessary.

Now your layer palette should look like below.



Next we will create a new layer. Select the new layer icon as indicated by the arrow as shown below.

Name Layer 2 or the new layer to Stamp shape and change the Color to orange as shown below.

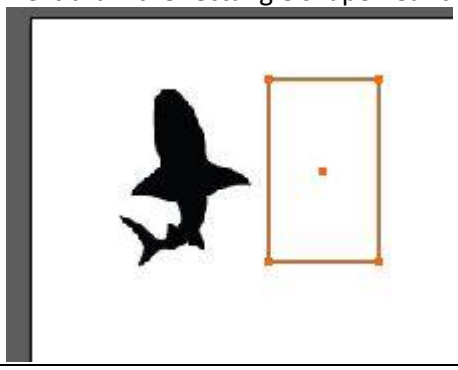


Step 7. Draw the stamp area shape.

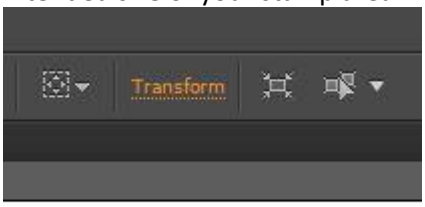
On the left tool panel, select the rectangle shape command.

Make sure your stroke is set to black and the field color is off as indicated by the red diagonal line as you see below.

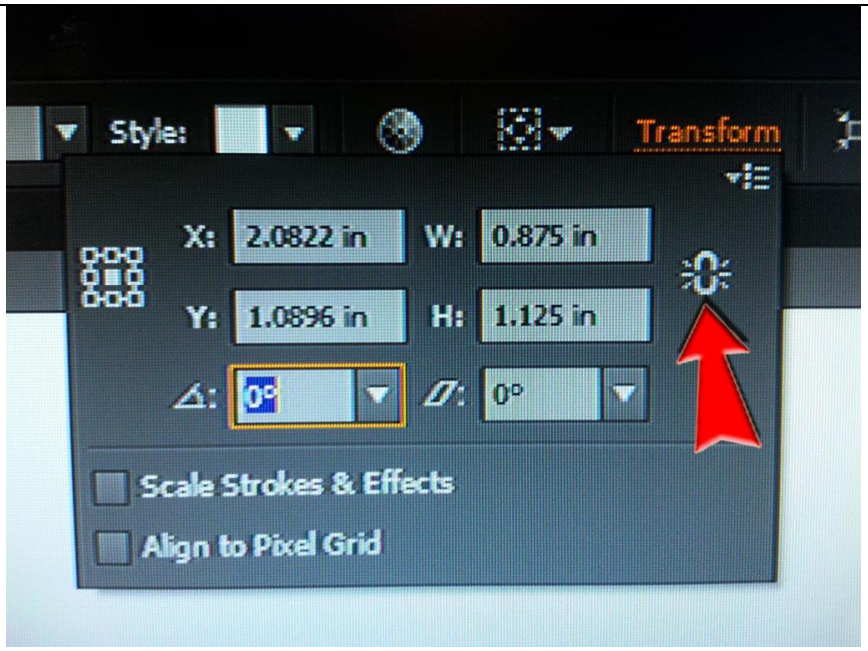
Next draw the rectangle shape near the shark artwork, as show below.



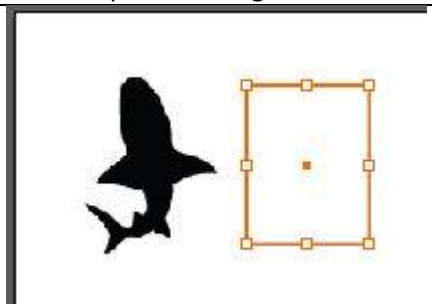
Step 8. Using the Transform tool on the tool bar above your design to make the rectangle the intended size of your stamp area.



Click on the word Transform to open the fields to change the dimensions to the intended size of your stamp as shown below. Make sure the change icon is deselected as indicated by the red arrow. Set the W: to .875 and the H: 1.125.



Your shape will change like the one as shown below.



As you can tell after we Transformed the rectangle shape to the size W: .875 & H: 1.125, the shark design does not fit. We must now convert the shark image into vector (line) art so to scale down the shark image to easily fit in the rectangle shape size. Remember the rectangle shape size is the size of the piece of wood and rubber that make up our rubber stamp.

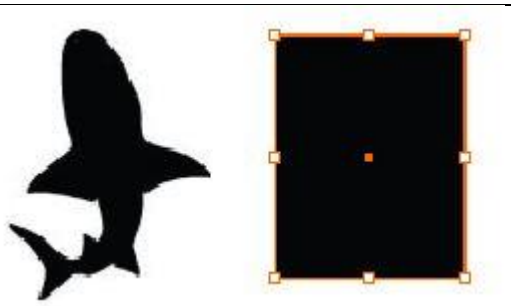
Step 9.

Changing the Rectangle to be the area we laser engrave away the material we do not need in the stamp.

In laser engraving a stamp one must laser away the area around the design like a photograph negative. So must convert the fill options of the rectangle.

1. Select the rectangle with the black arrow on the tool palette to the left.
2. Your file and stroke settings will need to be changed to look like this below

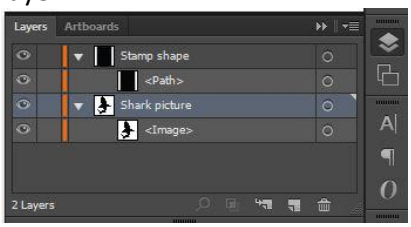
3. Your rectangle should look the image below, with the rectangle all black and NO white outline.



Remember to make our stamp the black area will be engraved and any white area will be left.

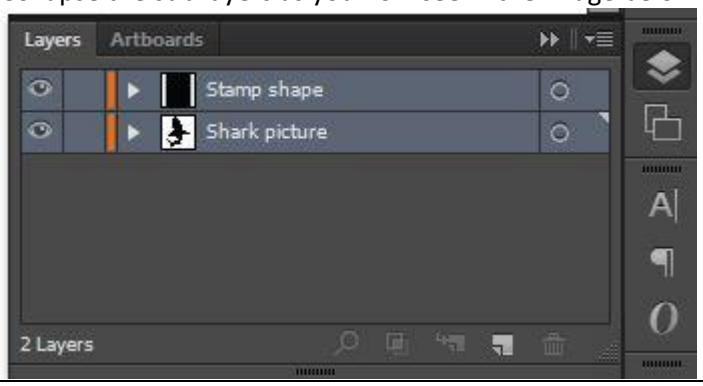
Step 10. **Changing the layer arrangement.**

Notice how the black rectangle layer is above the layer we placed the shark raster image. We need to move the black rectangle layer to below the the shark artwork layer.

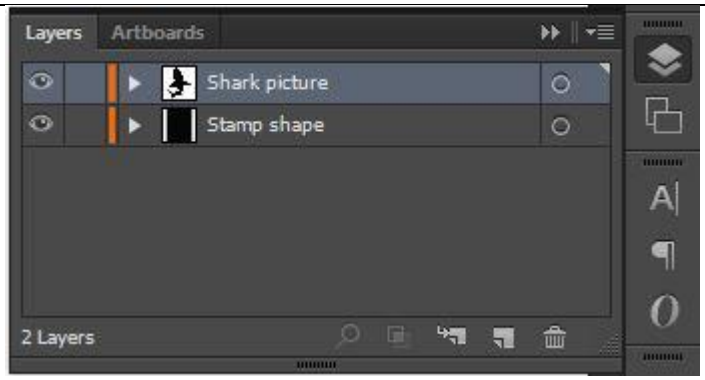


The shark artwork must be above the Stamp shape layer before we convert the Shark artwork to vector artwork.

Step 10.1. Collapse the sub layers as you now see in the image below of the layers pallete.



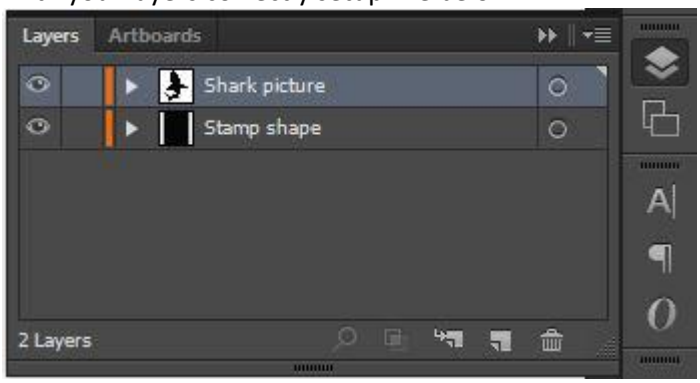
Step 10.2. With the Shark picture layer highlighted “grab” and drag the layer on the palette menu to above the Stamp shape layer as shown below.



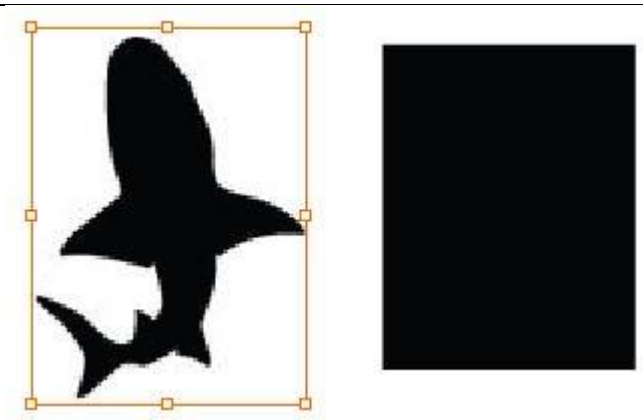
Your Layers palette menu should look like the the Layers palette menu above.

CAUTION: If you did this incorrectly, your layers palette will look like the one below. If so **<ctrl> z and DO THIS AGAIN**. YOU DO NOT WANT YOUR STAMP LAYER ON THE Shark picture layer.

Step 10.3.	Converting the Shark picture to a vector image.
	With your layers correctly setup like below.

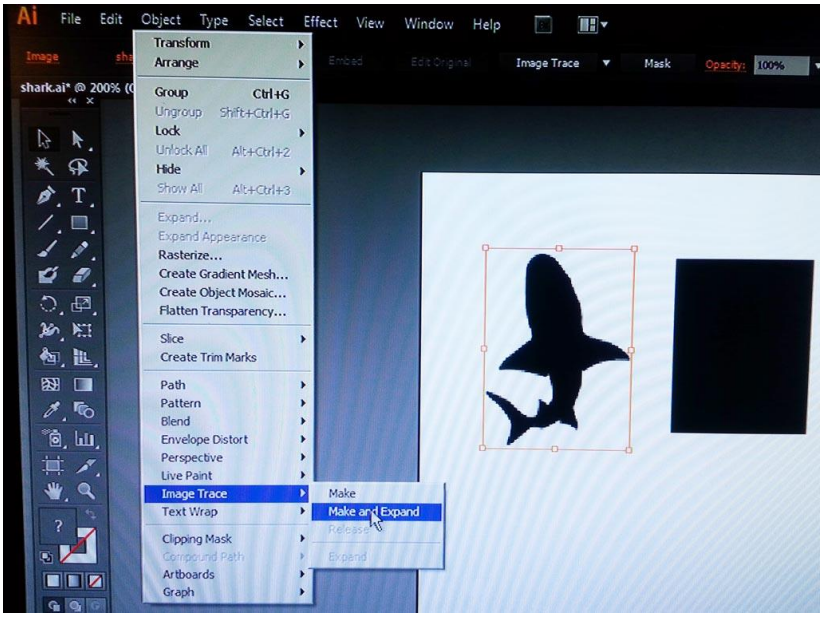


Step 11.	**Converting Raster Image To Vector**
	Select the Shark picture as shown below.

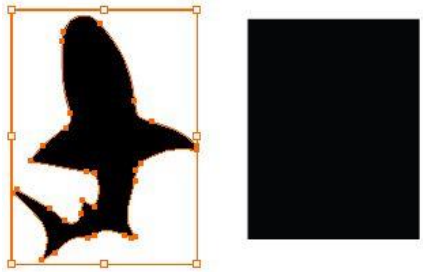


Notice the "jagged edges" and stair stepping on the image. This is indictive of a raster image, which will not work in creating a quality rubber stamp.

Step 11.1. Select the Object pull down menu, then Image Trace and then Make and Expand as shown below.



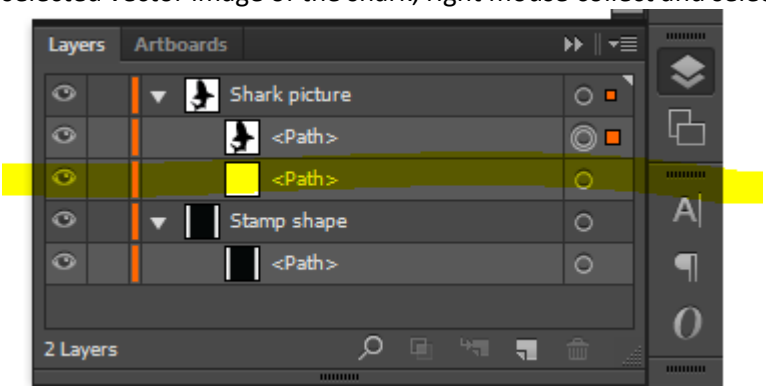
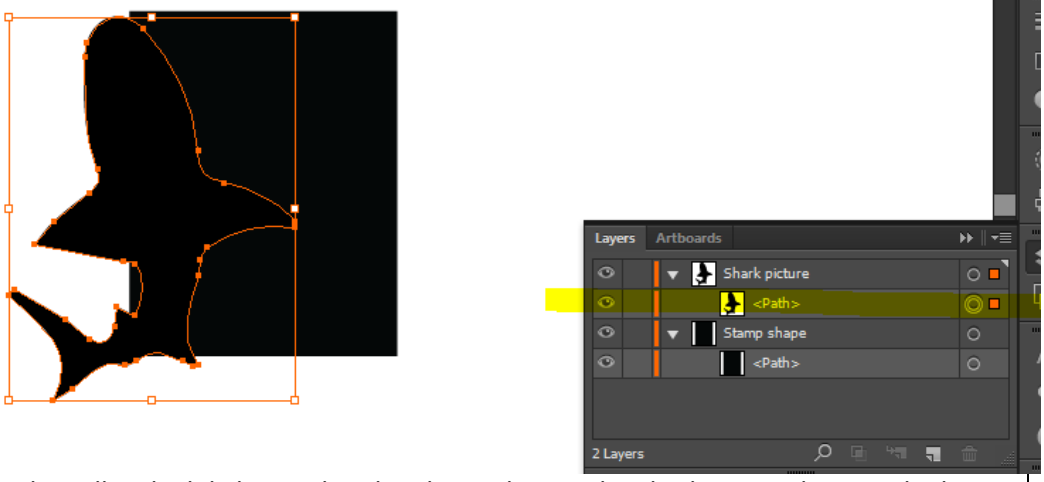
This will convert the image to a vector file as shown below.

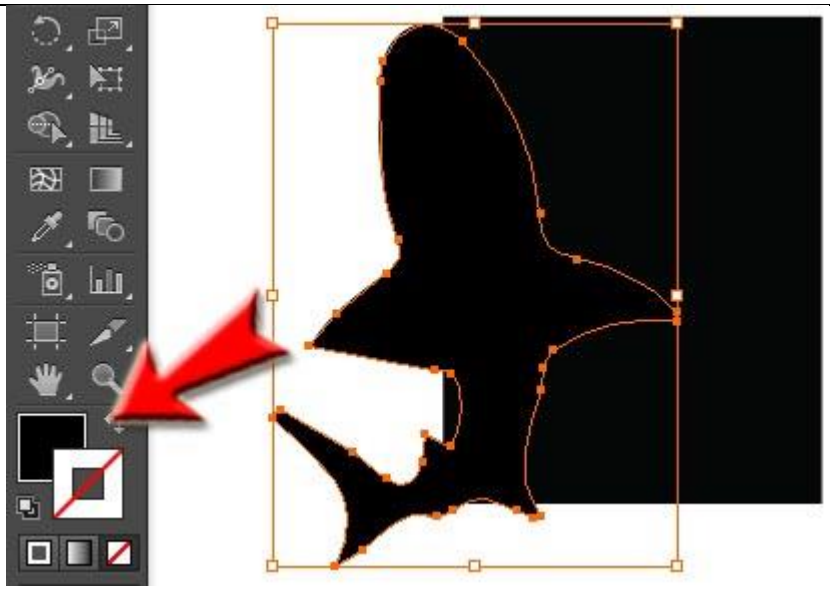


Here the Shark picture has been converted a vector image as evident by the control nodes (the little orange boxes around the image) on the shark picture.

Step 11.2. Converted Image considerations:

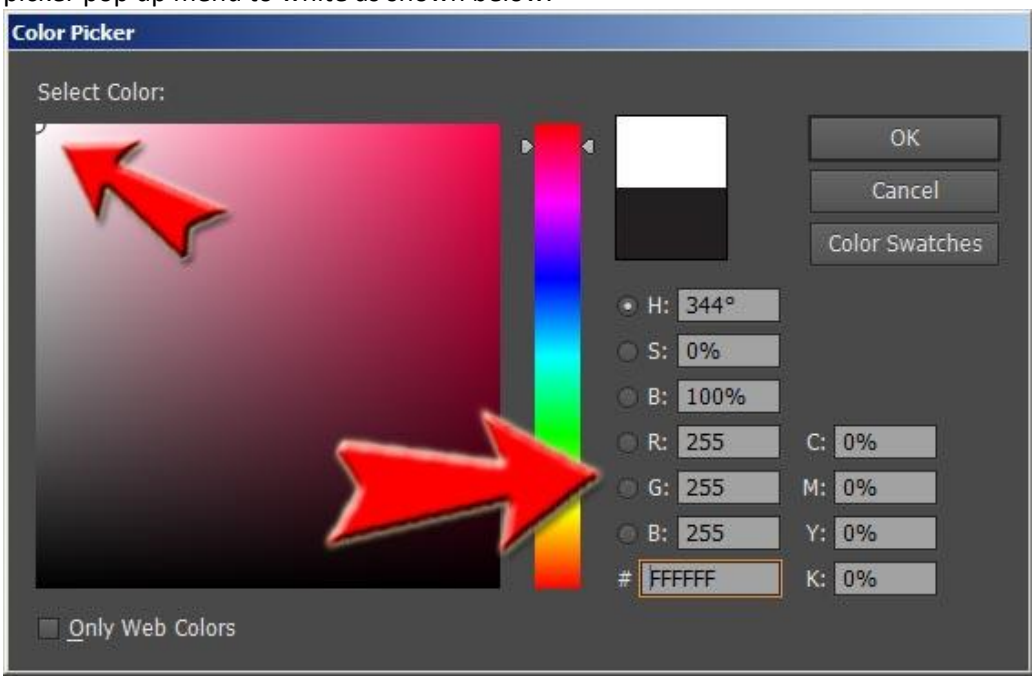
a. Now the image has been converted to vector art, the image is now a collection of vectors pieces.

	b. The vector image consist of a white background and black foreg round of the shark. c. We must now ungroup this collection. d. We must delete the white backgournd. e. Move the black shark to half way over the black rectangle. f. Change the shark vector to white. g. Move the now white shark image to cover the black rectangle and then Free Transform (E) the shark image to fit with in the black rectangle.
Step 12.	Ungroup the shark image collection of vector art pieces. With your mouse over the selected vector image of the shark, right mouse collect and select Ungroup.  When the raster image is converted it created two layers with the shark <Path> and the <Path> layer as high lighted in yellow above. Drag the high lighted layer to the trash can on the lower right of the Layers palette menu to remove that layer from your Rubber Stamp file.
	Save your file.
Step 14.	Move the black shark to half way over the black rectangle, As you see below.
	 Notice the yellow high light <Path > this shows that on the Shark picture layer, only the shark <path> exist.
Step 15	**Change the shark vector to white.**
	Your current settings for color file should look like as shown below.



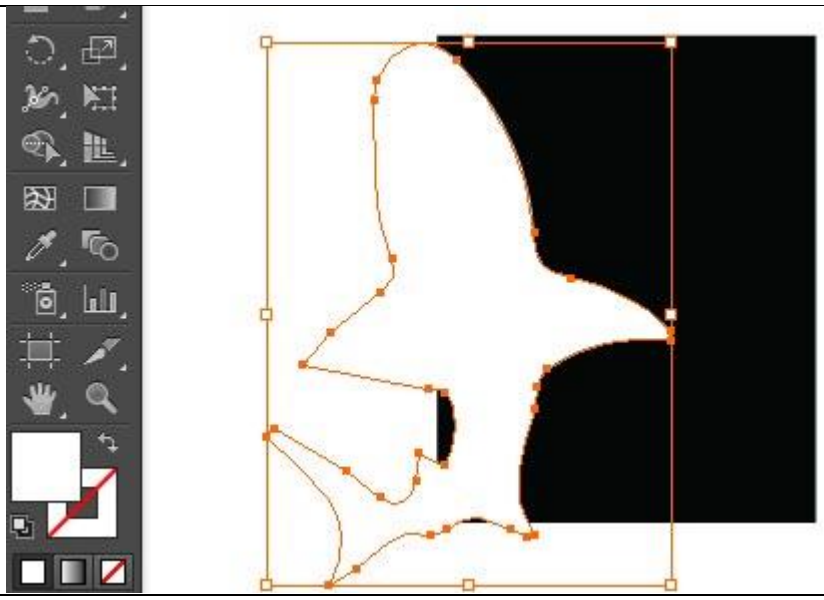
Notice on the Tool panel to the left the stroke is marked out and the fill color is set to black.

Step 15.1. Set your fill color to white by double clicking on the black fill box and using the color picker pop up menu to white as shown below.



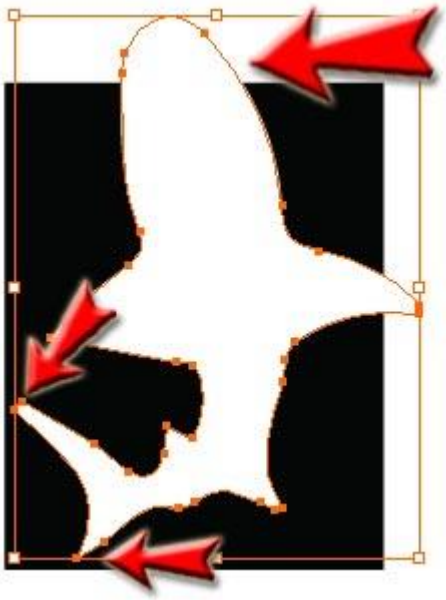
Notice the upper left arrow, move your Color Picker circle to the upper left, as you do this your R:, G: and B: values should be maximized to R:255, R:255 and R:255 as indicated by the large arrow on the lower middle of the image above.

Step 15.2. Should shark vector art and color fill should look like the image below.

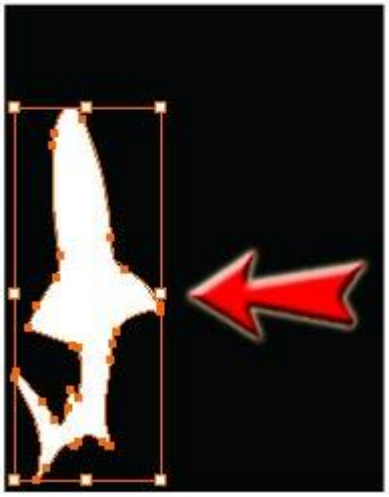


Step 16. **Move the now white shark image to cover the black rectangle**

Your shark image over the rectangle should look like the image below.



a. The top arrow shows that the white shark image is too big and we must scale down or Free Transform (E) the vector image to fit inside the black rectangle. This critical for the production of our rubber stamp.
b. On the placement of the white shark image over the black image we use the arrow keys on our keyboard to "nudge" the image to fit inside black rectangle.
c. The white shark image must fit entirely insidte the black rectangle. This will allow the laser engraver to burn completely aroung the image shark image when we laser engrave the design.
d. Notice how the two smaller arrows indicate our lower left of the shark image is inside the black rectangle.

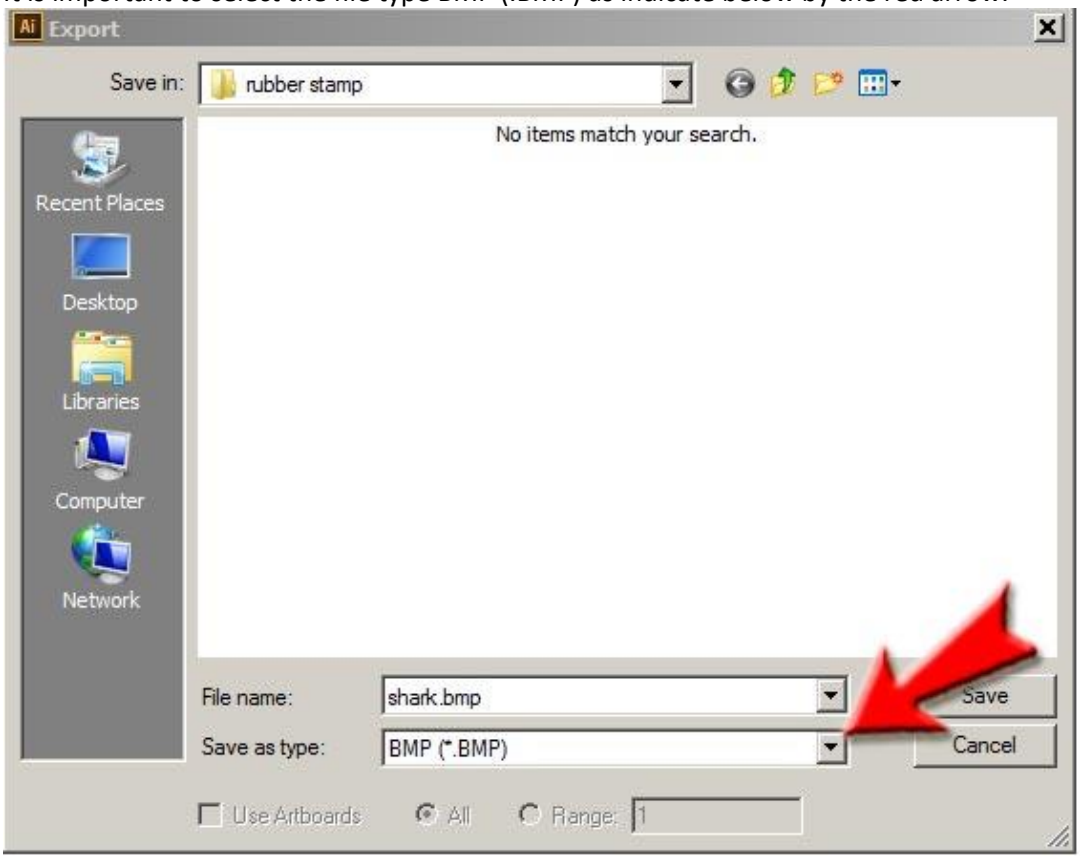
Step 17.	Free Transform (E) the shark image to fit with in the black rectangle.
	Select either the (E) key from your keyboard to active Free Transform (E) or select the Free Transform command from the Tool panel on the left, as shown below. 
Step 17.1.	Select the upper right node, hold down your <shift> key on the keyboard and scale the white shark image and drag to the lower left to fit the white shark image within the black rectangle as shown below.  The <shift> key forces Adobe Illustrator to equally and proportationally scale the white shark vector image down to your desired size. IF you did not hold the <shift> key, your image might look like the image below and that is not acceptable.  IF this occurs, <ctrl> z and repeat Step 17.1.
Step 17.2.	Your file should look like as shown below.

Now we must EXPORT this file to a .bmp file. The laser engrave software LaserCut 5.3 easily read .bmp files for laser engraving.

KEY POINT FOR CONSIDERATION: The Rabbit Laser will only laser engrave away the rubber material that is black from the image above. This leaves the white shark image as a releif on the rubber, thus creating a shark image on our rubber material.

Step 18. Select the **File** pull down menu and select **Export…** as shown in the image below.

It is important to select the file type BMP (.BMP) as indicate below by the red arrow.



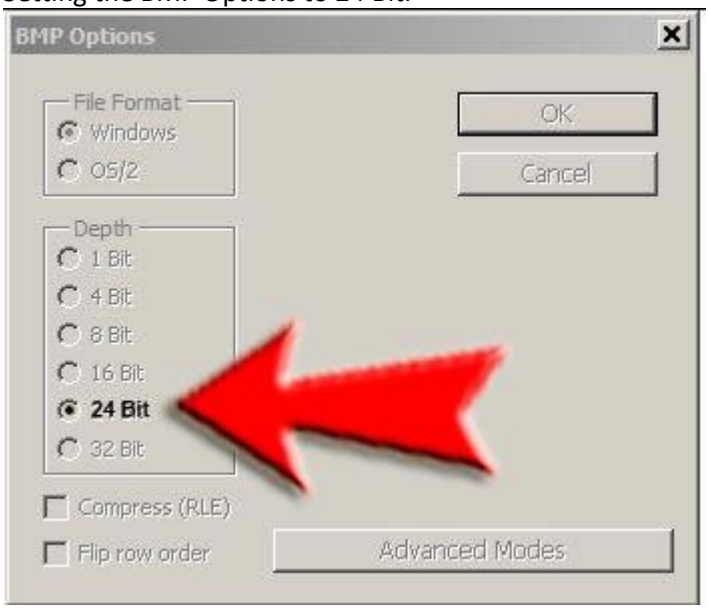
Save the file on your computer into a directory can easily find. Then, again save the file to a thumb drive or memory stick your file is ready to be transported the Rabbit Laser engraver for creating your Rubber Stamp.

Step 18.1 When you select OK, the Rasterize Options menu pops up.

CRITICAL, set the output resolution to 300 ppi (Points Per Inch), as shown below.

Step 18.2.

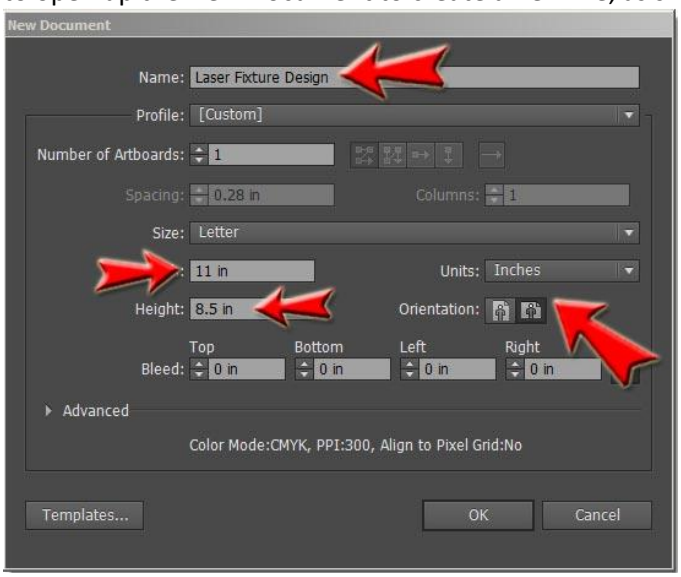
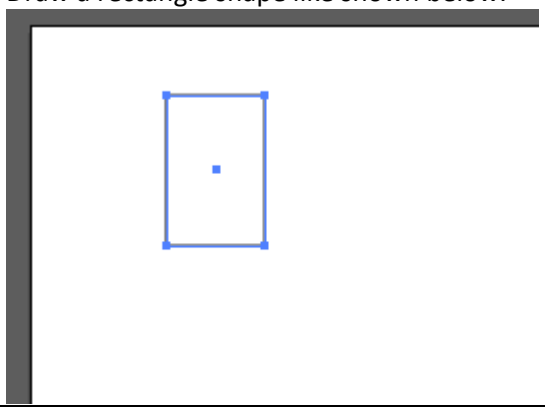
Setting the BMP Options to 24 Bit.

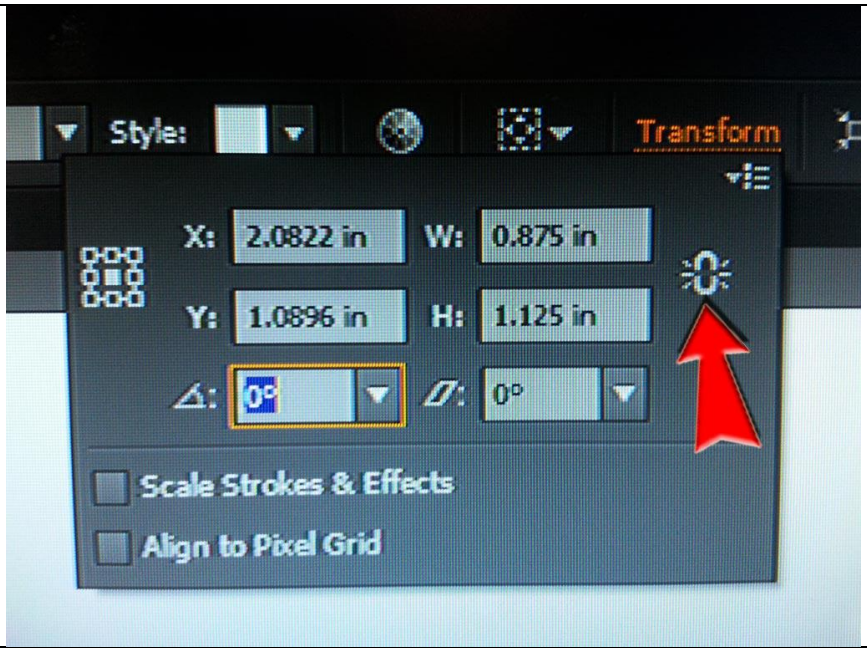


Make sure you select 24 Bit and click OK.

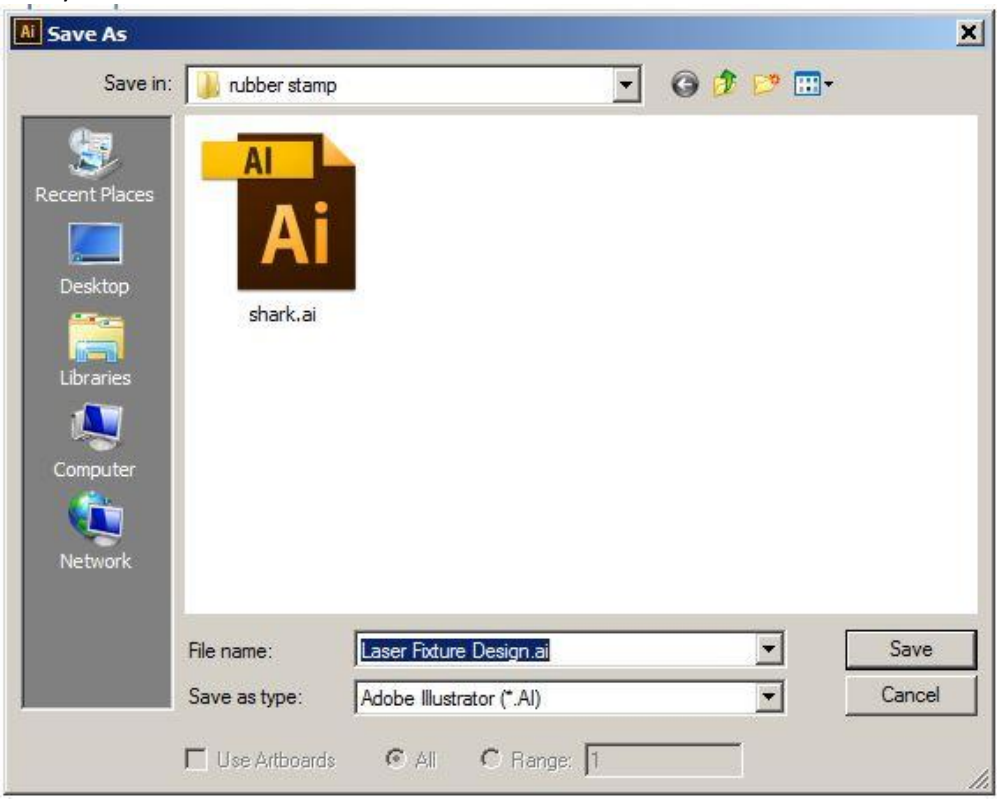
Now your file is created and ready to laser engrave.

Step 19.	**Setting up the Rabbit Laser and laser engraving your rubber stamp.** When manufacturing the shark rubber stamp and other similar rubber stamps of this size and different sizes it is best to create fixture to load in your Rabbit Laser Engraver system. In this step will design a fixture in Adobe Illustrator that can accommodate future rubber stamps we design of different sizes.
Step 19.1.	Open Adobe Illustrator.
Step 19.2.	Create a New File using the new file settings as shown below. While still in Adobe Illustrator, probably with your Shark.ai file still open, key in <ctrl> n

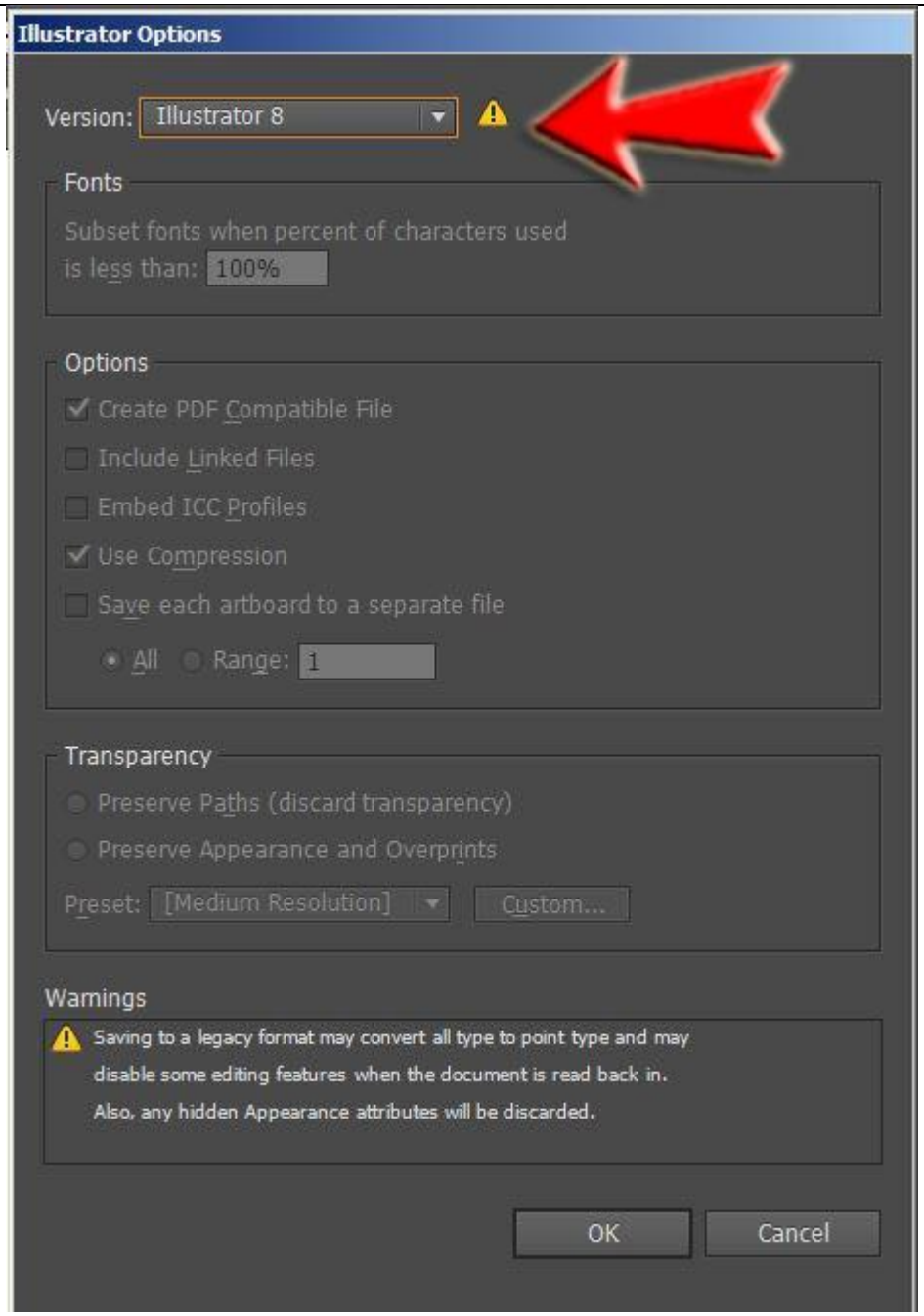
	to open up the New Document to create a new file, as shown below.  a. Name: give your file a name, Laser Fixture Design. b. Set your Width and Height to 11 in and 8.5 in . c. Make sure your Units: are set to Inches. d. Make sure your orientation is set to Landscape. As all are shown above.
Step 19.3.	Select the Rectangle shape command as shown below. 
Step 19.4.	Draw a rectangle shape like shown below. 
Step 19.5.	Now select the Transform tool from the top menu bar, as shown below. 
Step 19.6.	Set your settings identical to the ones used to create the black rectangle, as shown below.



Step 19.7. Save your Adobe Illustrator file as shown below.

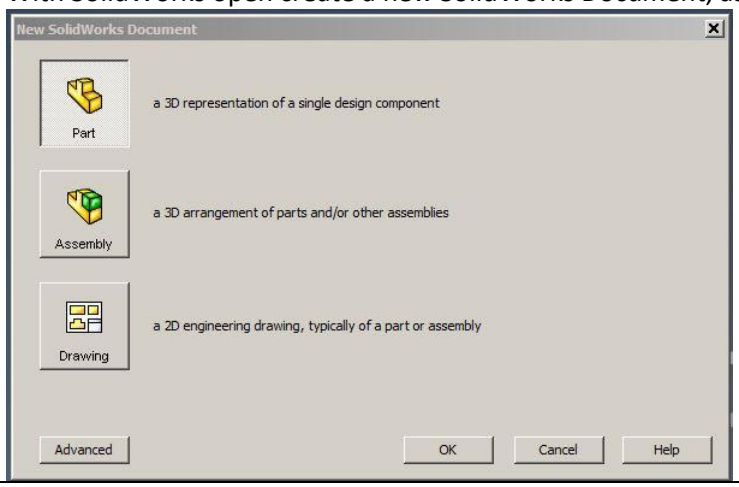


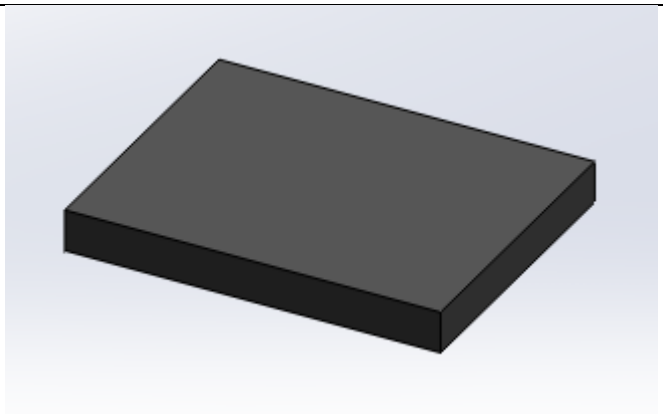
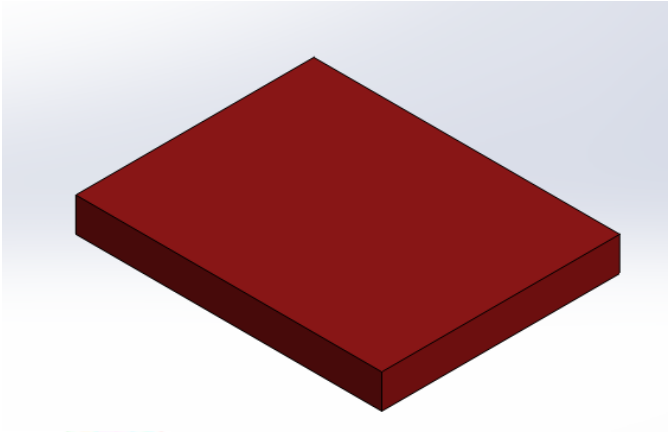
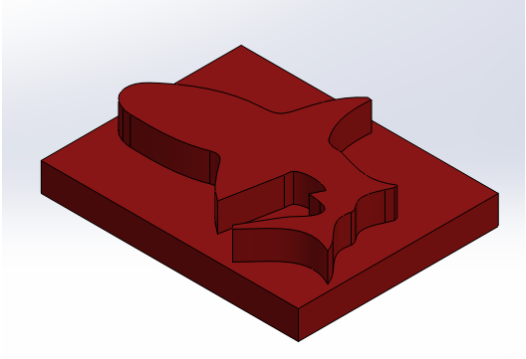
Step 19.8. **CRITICAL**: Save your file as an Illustrator 8 version file.

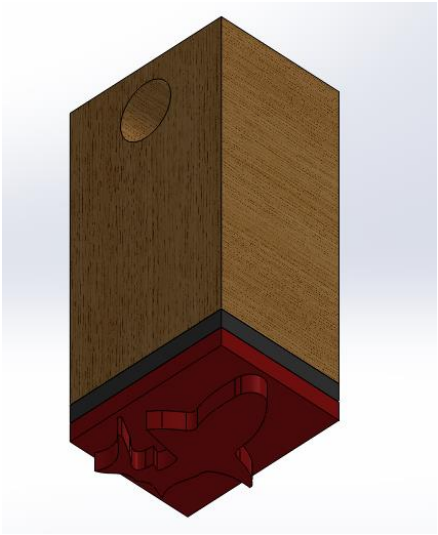


Remember to make a fixture to hold our rubber blank, we will have to laser cut a hole to place our rubber blank in. Remember to save the file to your memory stick, along with your shark.BMP file.

Step 20.	Designing your rubber stamp in SolidWorks Your Rubber Stamp will consist of 3 parts to form the assembly. a. The wooden holder b. The neoprene cushion

	c. The rubber stamp laser part.
Step 20.1.	Open SolidWorks and create three part files. a. Create the wooden_holder. SLDPRT. b. Create the neoprene_cushion. SLDPRT. c. Create the rubber_stamp_laser_piece.SLDPRT With SolidWorks open create a new SolidWorks Document, as shown below: 
Step 20.2.	Creating the wooden holder.  With the 3 files created, watch the YouTube Video on how to create the wooden holder part. Click on the YouTube Link or copy and paste the link and open in your web browser software. http://www.youtube.com/watch?v=IPDWCRiNJZU
Step 20.3.	Creating the neoprene cushion.

	 Click on the YouTube Link or copy and paste the link and open in your web browser software. http://www.youtube.com/watch?v=wtiOcwUb8r4
Step 20.3.	Creating the rubber stamp part base design part 1. Click on the YouTube Link or copy and paste the link and open in your web browser software.  http://www.youtube.com/watch?v=_AK0Sbc4jyg
Step 20.4.	Creating the rubber stamp part base design part 2. Click on the YouTube Link or copy and paste the link and open in your web browser software. 

	http://www.youtube.com/watch?v=_AK0Sbc4jyg
Step 20.5.	Creating the rubber stamp assembly. Click on the YouTube Link or copy and paste the link and open in your web browser software.  http://www.youtube.com/watch?v=jzRijnwqH7Q

Step 21.	Making your rubber stamp materials to construct your rubber stamp. Watch Student Demonstration in class.
Step 21.1.	Creating the wooden holder.
Step 21.2.	Creating the neoprene cushion.
Step 21.3.	Creating the rubber stamp part.
Step 21.4.	Assembly of the Rubber Stamp

Step 22.	Testing your rubber stamp and having fun.
Step 22.1.	Get an ink blotter and paper.
Step 22.2.	Start having fun by stamping with your new rubber stamp you designed and you fabricated .
Step 24.	Summary & Reflection
Step 24.1.	Summary of Accomplishments

	a. You found an image on the internet. b. Used Adobe Illustrator to create the necessary artwork for: a. Producing laser engrave ready artwork at the size necessary for our materials. b. Producing .dxf (Design eXchange File format) to allow us to build an accurate 3D model in SolidWorks for building a real Rubber Stamp product. c. Using SolidWorks you design a 3 part assembly of a Rubber Stamp, integrating, by importing design data from Adobe Illustrator. d. You used a Table Saw, Band Saw and Drill press to take rough sawn wood to fabricate your wooden holder e. You used a Laser Engraver to create your rubber stamp component of your rubber stamp assembly. f. You fabricated the assembly into a valuable product that can now be massed produced.
Step 24.1.	Reflection of Project a. Through our reading and web research, we have discovered a growth industry and financial opportunity. b. Through our reading from the tutorial and viewing the SolidWorks YouTube videos we can now design many different types of Rubber Stamps. c. From our classroom instruction and experience with standard power shop tools and a laser engraver system, we can now mass produce our design. d. We now have the ability to mass produce products for our financial gain, thus now creating business opportunity for our selves.