Using A Plotter Cutter in Your Studio

The possibilities seem endless. Plotter cutters used to be only in the domain of commercial design studios. Now you can buy one to use in your studio for around $400.00 or less.

The tool is just like all computer graphic applications in that it uses locations on an X Y Axis to plot the shapes of your drawings. (This all began with the development of radar screens during the last world war.) So by using a vector based drawing program, you can accurately draw shapes to cut on the plotter. (And repeat them, make patterns and distort/resize them.)

Let's get started:

There are two types of computer graphics, Vector and Raster (or Bitmapped) based.
Vector art is based on mathematically defined points and paths. Vector images are made with Points and Paths aligned to the X,Y Axis. The points anchor the paths just like a Connect the Dots drawing.

Pixel images are like mosaics. Made from tiny squares of data. Zoom in and that's what you'll see.
Vector images can be enlarged without this "Pixelation effect" Cutters use vector files in SVG format.
And BTW, these drawings are great for use with your jewelers saw and making pancake dies if you print them!

The Cricut cutter comes with an on line interface called Design Space. It can convert pixel based images to vectors for cutting. But the cleanest cuts come from native vector files. So it's worth it to learn to use them if you are concerned about accuracy.

Free vector drawing software:

https://www.nchsoftware.com/drawpad/index.html
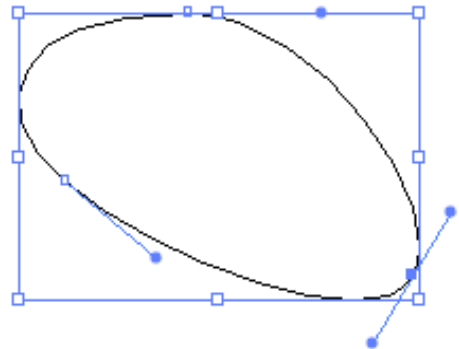
https://vectr.com/#

https://inkscape.org/

(I gave Inkscape a test drive. Nice program for free but doesn't have all the bells and whistles of Illustrator.)

On the right is a screen shot of a vector based object. (Yes, they are called objects.)
The box around it is called a Bounding Box. When it is highlighted, it denotes the object is selected and active. Click away from the object to de-select it.

The path of the shape is between the Anchor Points. When the Anchors Points are selected by the Direct Section Tool (white arrow), they display handles called Control Handles. These shape the depth of the curves.

Something to remember! Shapes (objects) with less vector points will print/cut smoother! Also any kinks in your path will mar your finished cutting.

Fun and Easy Ways to Make Shapes in Illustrator

Illustrator comes with a Symbol Library that can be taken apart and altered. Lots of stuff to download too on line. But if you want your own custom art work, best to draw it yourself.
Take a look at the basic shapes tools. Draw a Square (M on your keyboard)

an expanded symbol

Use the Selection tool (black arrow) to size and rotate your square. Draw another.
Go to>Window>Pathfinder.
Overlap the squares you made and try out the Shape Modes. In order to take the pieces apart, Object>Ungroup. The Pathfinders make new Paths. If you hover your mouse over each Icon, it will tell you what they do.
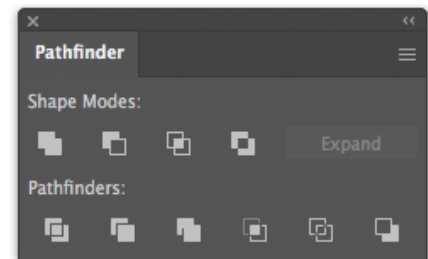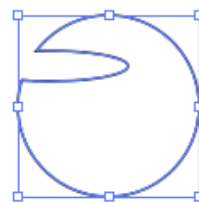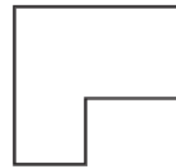
Another cool tool is the Blob Brush. This works hand in hand with the Eraser Tool to make complete closed paths. Double clicking on the tool with bring up its controls.

Remember!! You must CLOSE YOUR PATHS. An open path will not create a shape. Think of the paths as a road your cutter knife will travel.
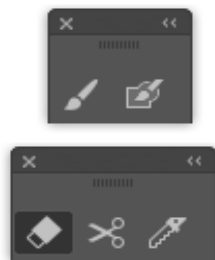
Illustrator has the ability to auto trace pixel images and create paths. This is automated process and I usually don't use it for cutting because the drawing tools are easier and create a cleaner path. If I want to trace, I do it by hand with the Pen Tool. I scan a drawing, File>Place and trace it on another layer.
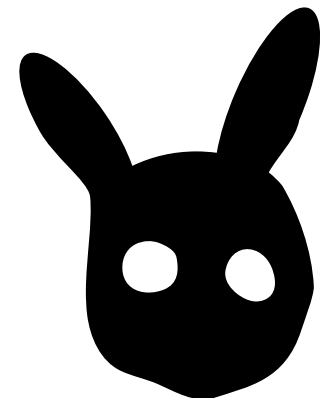
Shapes Tools

Pathfinder Shapes

Blob Brush and Eraser Tools

This shape was made with the Shape Builder Tool Shift+M from three ellipses and eyes cut out with Pathfinder using Minus Front

Which machine should you buy?

We are talking about consumer level machines. My first experience was in my classroom with a Roland Stika which is primarly a vinyl cutter for stickers and heat transfers. I think the consumer level machines offer more options at this point for what we are interested in.

Here is a link to help you decide.
https://craftindustryalliance.org/which-cutting-ma-chine-should-you-buy-a-review-of-the-top-6-most-popular-digital-cutting-machines/

I decided on the Cricut Maker because of the design and support available. Most of these cutters have different accessories for cutting different materials. Like a special wheel for cutting fabric or deep cuts.

Materials I have cut with the Cricut:

Paper, cardstock for roller printing and stenciling enamels, drafting film, adhesive vinyl masking for anodizing and etching, wax stencil paper, 40 gau copper sheet (also embossing for copper sheet), thin plastics and decals.

Others have cut precious metal clay. You can also carve PMC when its leather hard.
I'm looking at the PMC paper as a possible fun material. Polymer clay is another option.

Preparing and Saving Your Files for the Cutter:

Prepare your document size to fit your material and leave about .5" ease at the edges.
Always make sure you are in RGB Mode not CMYK when you set up your document!

When you finish drawing, check your path by going to View>Outline. Zoom in and look for any irregularities. (Command or Control Y)

Complex shapes that need to stay together should be made into a Compound Path.
Otherwise, the cutter interface will sort them individually to the cutting mat.
Select ALL and Go to>Object>Compound Path>Make

Save a file in the Native Illustrator format (.ai)

The do a File>Save As and save the file as a .svg
This is what you will send to your cutter.

On the Cricut, you will upload to their
on line interface Design Space.
You can also save files there.
Plenty of tutorials on line
on using Design Space.
https://www.pinterest.com/tbrudnak/plotter-cutting/