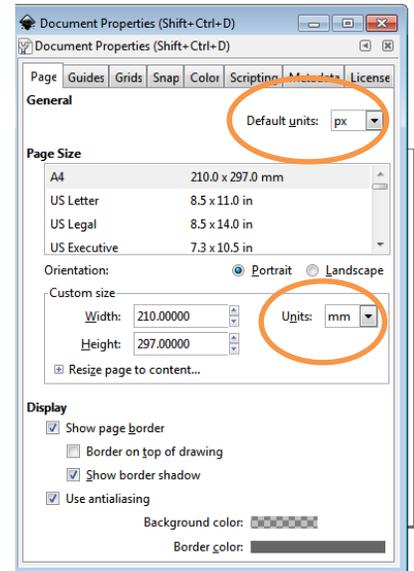# Understanding InkScape:

Designing for a Laser Cutter

Document properties

This is your first step to sizing your object. Go to File and CLICK on Document Properties. Under Default units change it to in (inches) instead of Px (pixels). Do the same for the Units as well. You can then edit your height and width to your size that is needed.

You will notice the canvas size has changed, you will need to design within the Canvas or it will not save properly. And when is sent to cut or engrave it will cut off your project.
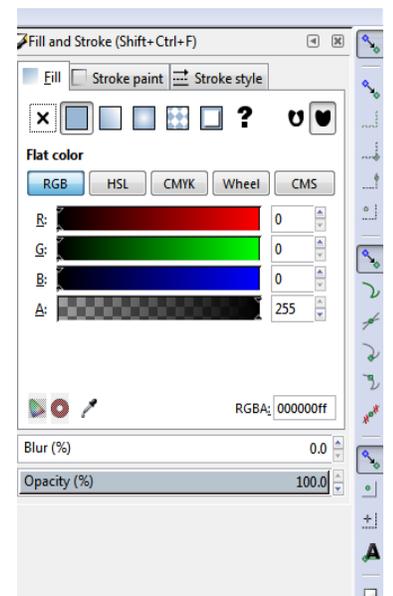
Example:

Correct   **Incorrect**

Object Properties

Fill and Stroke

Use the Edit Objects [icon] button to access the panel to change the fill and stroke settings.

You will see that the dialog has three tabs: Fill, Stroke paint, and Stroke style. The Fill tab lets you edit the fill (interior) of the selected object(s). Using the buttons just below the tab, you can select types of fill, including no fill (the button with the X), flat color fill, as well as linear or radial gradients. For the above shape, the flat fill button will be activated.
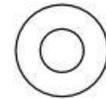
[icon] **Example:**

Fill The colour inside an object.
This donut shape has a grey fill. An object can have no fill, which means it is transparent, not to be confused with an object that has a white fill.
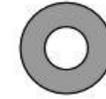
Stroke paint The line around the edges of an object.
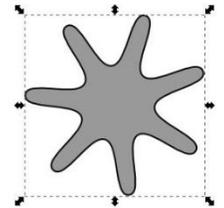This donut shape has a black stroke and no fill. The stroke size can be set to create thin or thick lines.

This donut shape has a grey fill and a black stroke

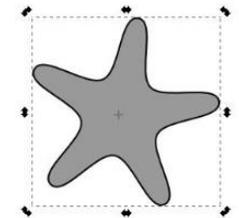**Size**
The dimensions of an object.
Objects can be resized by clicking on the arrows on the bounding box and dragging, or by typing in the desired size in the dimensions box on the menu.

Orientation
The way an object is turned.
Objects can be turned by clicking on it once, and then a second time. When you see the curving arrows on the corners, you can click and drag on one to rotate it.

Cutting vs. Engraving

The Laser Cutter decides when to cut and when to engrave a design based on the size of the stroke set on an object.

Cut: stroke style of 0.001" in

Engrave: stroke size of 0.002" or higher and all fills

NOTE: Objects can have *both a fill and a stroke*. A circle with a black stroke and a black fill will look the same as one with only a black fill, so check your settings to be sure it is set up the way you want.
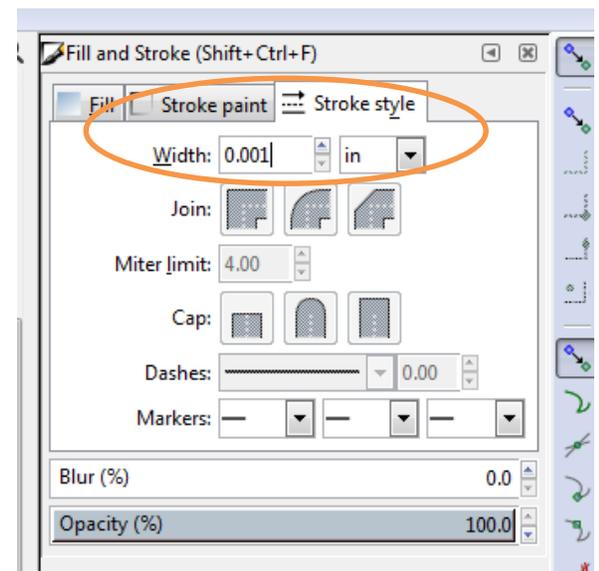
Can you tell by looking at these circles which one has a black fill and which one has both a black fill and a black stroke?
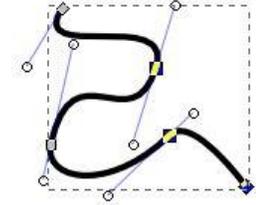
Tools

The main tool bar for drawing and editing shapes and lines is on the left side of the screen.
These are not all the tools, but they're the ones you'll use the most when designing for a laser.

Select

Use the Selector tool to edit objects, including moving, resizing and rotating.
Choose multiple objects by holding down Shift and clicking on them, or if the objects are near each other you can draw a box around them.
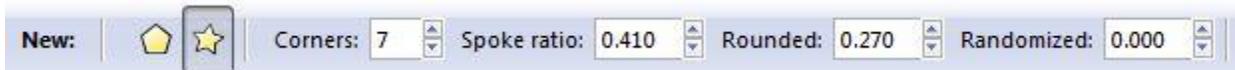
Edit Paths

Use this to edit the paths of an object (the shape of the lines) by clicking on the nodes and dragging them and using the handles of a node to adjust the curve of the line it is attached to.

Zoom

Zoom in and out of the view without changing the size of objects.
Choosing the zoom tool then clicking on the screen zooms in.
Hold down the control button and click on the screen to zoom out.

Oval & Rectangle

Draw ovals or rectangles. Click on the tool, then click and drag on the screen.
To create a perfect circle or a perfect square, hold down the control button while drawing.

Polygon & Star

Draw symmetrical shapes with multiple sides. Use it the same way you would the oval or rectangle tool, but edit the features on the menu along the top.

New: Corners: 7   Spoke ratio: 0.410   Rounded: 0.270   Randomized: 0.000

Corners: edit the number of points the shape has
Spoke Ratio: edit the distance between the points and the inner corners
Rounded: decide how pointy or round you want the points to be
Randomized: distort the shape

Spiral

Draw spirals with as many turns as you like.

Turns: 3.00   Divergence: 1.000   Inner radius: 0.000

Turns: the number of turns the spiral makes
Divergence: the number lines layered in the spiral
Inner Radius: the inside point where the line ends

Bezier

Draw any shape you want, freehand.
Choose the tool, then click hold the button down, moving the mouse to adjust the curve. Let go when you are happy then keep going until you have drawn the complete line or shape that you want. Draw straight lines by clicking and immediately letting going of the mouse button before you move it (you can use the Edit Paths tool after to change the nodes to curves if you like).

Creating Text:

By Clicking on this tool, an then clicking it on the canvas. You will see your courser start blinking. You can then start typing your text.

Or you can click and drag your mouse and a text box has ben created. You can then create text within that box. You can also make your text individuals. By typing a letter or a work and then clicking your text tool on the page again and typing.

There are many different effect you can make with the text tool. You can curve your text.

http://goinkscape.com/how-to-curve-text-in-inkscape/ Great link Here to learn how.

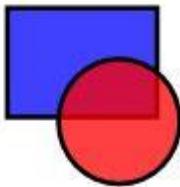You can turn your text into an object and have the letters cut out.

You can also change the font style by highlighting your text and selecting

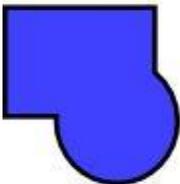The menu here . You can also adjust the size of your text by using your select tool.
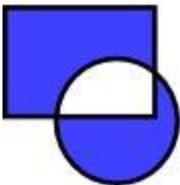
Under the Path Menu:

Original shapes

Union: Will combine shapes to become one single shape with no line with in the shape.

Difference & Exclusion: The Difference and Exclusion commands can only apply to two selected objects; others may process any number of objects at once. The result always receives the style of the bottom object.

Union (Ctrl++)   Difference (Ctrl+-)   Intersection
                   (bottom minus top)   (Ctrl+*)

Intersection: Will create a shape from the two former shapes that were overlapping each other.
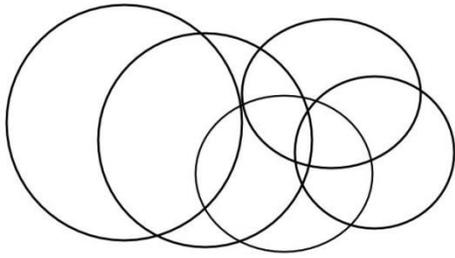
Division and Cut Path: Division and Cut Path is that the former cuts the entire bottom object by the path of the top object, while the latter only cuts the bottom object's stroke and removes any fill (this is convenient for cutting fill-less strokes into pieces).

Exclusion   Division   Cut Path
(Ctrl+^)   (Ctrl+/)   (Ctrl+Alt+/)

Exclusion: The result of the Exclusion command looks similar to Combine (see above), but it is different in that Exclusion adds extra nodes where the original paths intersect.

Combining Objects

Create complex shapes by combining objects.
Let's make a cloud shape.

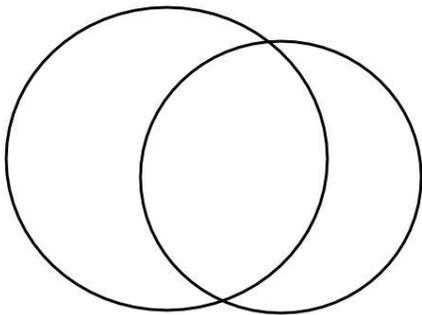1. Draw a bunch of ovals and overlap them.

2. Now select them all, then go to the Paths menu and choose Union.
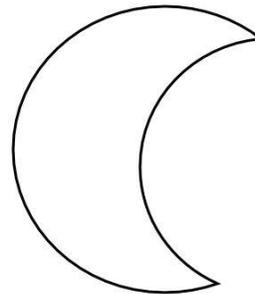
Sometimes you want to cut one shape out of another. The shape placed on top will be cut out of the other one and then disappear. Let's make a half moon.

1. Draw two overlapping circles. The left one was drawn first then the right one on top of it.

2. Select both of them, then go to the Paths menu and choose Difference.

Importing Images

The laser can only cut from vector files (SVG, EPS, AI), but you can import bitmap images (JPG, PNG, GIF) and convert them into vector images. This is AMAZING!
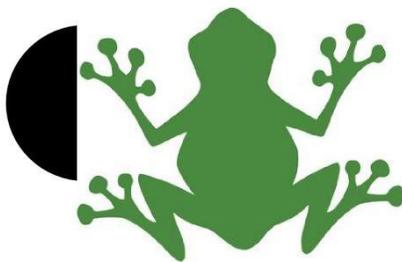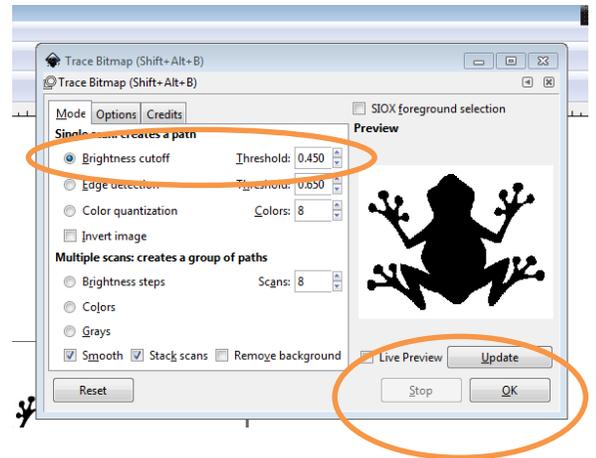
1. Locate and save an image

2. In InkScape, go to File Then Import and locate the image

3. Choose Embed and click Okay

The bitmap image is now on your screen, but you won't be able to change the fill or stroke or edit the shape. It probably even looks a little blurry. Once we convert it to a vector image all these problems go away.
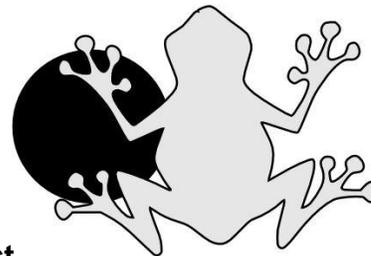
4. Select the image by clicking on it

5. Go to the Paths menu and click Trace Bitmap

6. In the Trace Bitmap window under the Mode tab, make sure that Brightness Cut off is selected and click Okay

Regardless of what colour the image was to begin with, it will now be black. You will also notice that there is no longer a white background around the image, which you can see in this example of a frog placed on top of a circle.
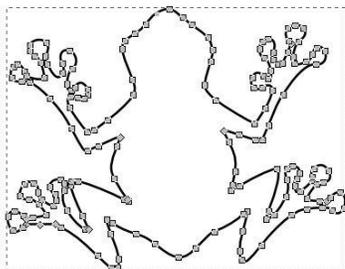
Incorrect

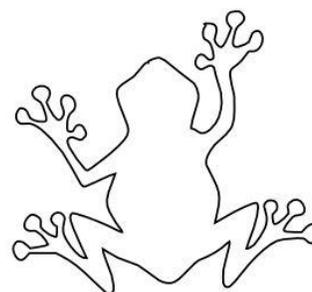Before using Trace Bitmap
Image has a white background

Correct

After converting with Trace Bitmap
White background is gone and the
fill and stroke can be edited

After converting with Trace Bitmap
the path can also be edited.
Notice the nodes

After moving the nodes around
And adjusting the curves with the handles,
the frog is now stretching out his right arm.

You can use the Edit Path tool to move around or delete the nodes to your liking.

You can also change the line to be a cut line by changing the **Stroke style to 0.001in".**

Saving your File!

You will need to save the file as the **Inkscape file a SVG**. You will also need to save your files as a **PDF (Portable Document File)** for the laser cutter to read it. The laser cutter still likes to think that it is a printer and will only read PDF files.

It is always useful to save booth version. If you run into a problem with the lase cutter not cutting where you wanted it to cut! You can then use your SVG to find the problem and correct it.

Please Note. SVG files do not like being emailed. They tend not to save what you designed properly. Always bring booth of your files in on a USB.

Tips and Resources!

Pinterest! You would be surprised at the amount of information you will find on Pinterest about Inkscape. Just type in Inkscape to the search bar.

Youtube! There is a tone of tutorials on Youtube for Inkscape and other Graphic design programs.

Blogs: You can find helpful blogs here at **https://inkscapetutorials.org/**

Offset text in Inkscape the easy way:

This is a great tutorial for editing different text http://cleversomeday.com/easyoffset/

How to Create a Logo in Inkscape:

https://youtu.be/mX7Nbj1xFco

Learn how to use the Bezier tool, like a Boss: This website teaches you how to use the Bezier by playing a game. http://bezier.method.ac/