TL;DR

Everything in Illustrator is a vector - a Bézier curve, made of anchor points and paths.

Be aware of which tool you’ve got selected when you start clicking around so you don’t accidentally create text fields everywhere.

Keyboard shortcuts make life in Illustrator so much easier. Important ones:

- **V**: Selection Tool
- **A**: Direct Selection Tool
- **Command/Ctrl + ‘+’ or ‘-’**: Zoom in/out
- **T**: Type Tool
- **Command/Ctrl + Shift + ‘.’ or ‘,’**: Nudge font size up/down
- **Command/Ctrl + Enter**: Exit Type mode
- **Option/Alt + Click**: duplicate object
- **Shift + Click**: auto-align object movement
- **Shift + arrow keys**: mega-nudge (10px at a time)
- **Command/Ctrl + Shift + 0**: create outlines from text
File Setup

For the laser cutter, document color mode [RGB!] matters. Vinyl cutter? Not so much. The easiest way to set up your document is right when you create it. This is the New Document dialog box:

Open up the Advanced tab to get to the color mode:
If you’re working in an existing document, change the color mode here:

To change the units, select **Document Setup...** and then select your units:
The Basics

Making basic shapes:

You’ll probably be making more rectangles and ellipses than anything else, so it’s useful to know the keyboard shortcuts. Hit `M` to get the rectangle tool and `L` to get the ellipse tool.

⭐ Pro Tips!
- Hold down Option/Alt (Mac/PC, respectively) while dragging the shape to create the new shape from the center out. This is useful if you want to center the shape around a certain point or feature.
- Hold down Shift while dragging to create a regular polygon - e.g. a circle or a square.

Selecting things:
Everything you make in Illustrator is a vector. That means you’re creating shapes that are made of lines and points. These points dictate everything about the shape - they tell the lines how to behave. Points, also called anchors, can have handles. These are what make curvy lines possible!
When you go to select something, you have 2 options. You can select the whole shape OR you can select aspects of a shape, say if you wanted to manipulate certain anchors or handles. The former is called Selection and the latter is called Direct Selection.

**Selection** is the default and it’s usually what you want. Just hit V to get back to this tool. (You’ll be hitting V a lot.)

**Zooming in & out:**
- Zoom in - Command/Ctrl + “+”
- Zoom out - Command/Ctrl + “-”

**Stroke & fill:**
Everything you create, whether it’s a shape or text or even just a line, has a stroke and a fill. These can be null, but they’re still properties.

The hollow shape represents the stroke color, and the solid shape represents the fill color. Click the arrows to switch them. With one of them selected, hit “/” or click on the red line to remove the color altogether. Double click on either to bring up the color picker to choose a new fill or stroke color. Clicking on an object will populate the stroke and fill boxes with its colors. Conversely, with an object selected, changing the stroke or fill color boxes will change that object’s stroke or fill colors.

★★ **Pro Tips!**
- The eyedropper tool will also let you select new colors. Click on the Eyedropper tool or hit “i” and then click on any object in your document to select the stroke and fill of that object.
- Hit “D” to return the stroke and fill to the default black and white, respectively.

**Moving things around:**
If you’ve selected a whole object with the **Selection** tool, you can just click + drag to move that object around. Selecting just a part of an object with the **Direct Selection** tool lets you manipulate isolated points and segments.

To create a duplicate of something, hold down **Option/Alt** and then click + drag. Want to align it to the existing object? Hold down **Shift**, too. It’ll snap into alignment.
You can also move things using just the keyboard, too. Nudge selected objects with the arrow keys - and hold down the Shift key while you do so to move 10 px at a time.

**Groups:**
To treat objects as a group, select those objects and hit Command/Ctrl + G. To ungroup, hit Command/Ctrl + Shift + G. To select individual items in a group, double click on the group.

**Dimensioning:**
Depending on what you’ve got selected, you’ll either see this panel:

![Dimensioning Panel]

or this:

![Transform Panel]

Click Transform to open up the transform panel underneath it:

![Transform Panel]

The grid of 9 clickable squares at the left tells you from which point on your object you’re dimensioning. For example, if you changed the width from 1.65” to 3” with the middle square selected, each of the edges would grow equally from the center of the object. Likewise, selecting the top left box would anchor that point, and the object would only grow out to the right and down.

This grid also lets you fine-tune the object’s position on the page. In this example, the X and Y show us the coordinates of the dead center of the object.

Click on the chain icon to link the width and height - changing one will change the other proportionally.
⭐ Pro Tip!
• Enter any dimensions into the boxes - want to spec something in mm? Just enter your dimension followed by “mm” and Illustrator will automatically convert it to the document’s units.

**Drawing fancy shapes**
This goes beyond the scope of this document, but it’s useful to know about the **Pen Tool**:

The **Pen Tool** creates Bézier curves. It lets you lay down anchors, and as you do, you can control the character of the lines between points with various types of handles. It’s great for tracing existing shapes, creating new shapes, or modifying existing shapes. This is really the nuts and bolts of Illustrator!

To get better with the **Pen Tool**, we highly recommend this website:
http://bezier.method.ac/
Text

For our purposes with the laser cutter and vinyl cutter, text is invisible until it’s been converted to outlines. (It can be raster etched, but it can’t be cut.) Unfortunately, text is no longer editable after it’s been converted to outlines - so be careful! When converting text, it’s a good idea to create a duplicate - by holding Option/Alt as you click and drag - so that you have a spare in case something gets screwy.

To create text, you’ve got a couple options. First, select the Type Tool by clicking the big T icon or just typing T. Then, you have a decision to make:

• If you just want text on a single line [Point Type], click anywhere and start typing.

• If you’d like multi-line text [Area Type], click and drag to create a box into which your text will go. That way, you can change the size of that bounding box and reflow your text without distorting the letters.

• If you are using Illustrator CC, you can change between the two types of text by selecting your text, then going to the Type menu and selecting “Convert to Point Type” or “Convert to Area Type.”

When you’re done typing, hit Command/Ctrl + Enter to exit type mode and get back to the Selection Tool. Otherwise, if you click anywhere else, it’ll create a new text box, and that gets annoying when that isn’t what you intended.

Formatting

Once you’ve got your text, you’ll want to make it look good. Choosing fonts is made a lot easier by a couple of tools, one of which lives inside of Illustrator.

If you just click on the dropdown menu of font names, you’ll get a list of all the fonts you can choose. Helpful, but wouldn’t it be nice if you could actually see what the fonts look like? Try clicking on the Character link to the left, and you’ll get a nifty panel:
Click on this font dropdown, and you’ll get a whole list of font previews. Pretty handy. But the most handy tool of all is at http://wordmark.it/, which gives you a preview of any text you’d like in every font installed on your computer.

There are tons of options in this character panel to change the line and character spacing, but you have much finer control over your text after you’ve converted it to outlines...

**Outlining Text:**
To create machine-readable outlines for your selected text, go to **Type → Create Outlines** or the easier method, hold down **Command/Ctrl + Shift + O**.

Once your text is an outline, it’s just another object - or more accurately, objects in a group. You can transform the whole thing as a group, or you can ungroup the individual letters to manipulate them individually. This helps a lot when you want to kern letters individually - you can just nudge them.
Resolving Overlaps

When you’re importing shapes from another program, or if you’re creating compound shapes, often you’ll have extra anchors/lines or, more likely, areas where shapes overlap.

![Venn Diagram](image)

Remember that the plugins that make your cuts on the laser cutter and vinyl cutter are really dumb. If they see a line, they’re going to cut a line. If, in the example above, you wanted to cut only the contour, you’d use what’s called the **Pathfinder:**

![Pathfinder Panel](image)

If you don’t see this panel [on the right hand side of the screen] go to **Window → Pathfinder** and you can move it wherever you’d like.

Click on the icon to reveal your various options:

![Pathfinder Interface](image)

Most of the time, you’ll want the one in the upper left corner, **Unite.** This is probably what you’ll use most often. These options can all get pretty confusing and their differences sometimes only matter if you’re dealing with objects that are styled differently - and that’s not something we worry about when all we care about are outlines. Just try out a bunch and see what works - **Undo** is but a click away!