Sketch-up is a vector graphics program. A vector graphics program is very different from a bitmap program such as the paint tool that comes with Microsoft windows. Bitmap files are large in size, and contain information about individual pixels (the little dots that make up an image). You may have noticed that if you increase the size of a digital picture, it gets distorted the larger you make it. That is not the case with a vector graphic.

The difference is that a vector graphic is not a map of individual pixels, rather, it is a collection of X and Y axis coordinates and other mathematical and geometric information. Vector graphic files are smaller in size, and the drawings can be scaled in size without distortion. This mathematical information that they are made of is also useful if you wish to export your drawings to a 3D printer, CNC machine, or other automated machine which is discussed in a later module. Drawing with a vector graphics program however, has some nuances that can frustrate new users. Here are a few examples:

Anytime two lines of an object intersect, they are welded together and the lines are cut into segments. Watch what happens to these two intersecting lines when I try to move them. As you can see, the lines are welded together, and they all want to move as one unit. This demonstrates both the welding of these two lines, and the segmenting of the intersecting lines.

So, how do you move a line that has been welded to another line? You can select all of the individual segments, then cut and paste the line somewhere else on the screen. To select multiple segments, hold down the shift key as you click on each individual line segment. Then, go to the edit menu, select cut, then select paste. Now this line is a separate entity and can be moves freely. However, if I place in on top of another object, it will again become welded.

If you want to prevent an object from being welded to another object, you can group the object(s). To do this, simply select the object that you wish to group, then select “make group” from the edit menu. Now that this line is grouped, I can place it on top of another object, and it no longer welds itself to the other object.

While some people might find these nuances frustrating at first, they can also be a very useful feature. For example, if you want to segment a shape, such as this circle, you can draw a line through it, use the line as a cutting plane, then delete the sections that you don’t want. I can also use this feature to segment a line or other object into equal sections. So I have a line right here, and using my snap tool, if I drag my pencil along this line, I can find its midpoint. I can draw a line and because these lines are intersecting, this horizontal line has been broken into two sections. I can continue to break this line into segments. Every time I segment this line, it has a new midpoint. I can continue this process indefinitely by zooming in and finding the midpoint of each new line segment.