

Grapher Tutorial by Monica Jarboe, MA198, Fall 2011

Grapher has both 2D and 3D options, but I've mostly been playing with the 3D. Format → Graph Template gives several choices for axis set-up, but I've been using the pretty standard "white" option.

The program automatically gives you the beginning of an equation:  $z=$ , so it's fairly open-ended, and you can change both sides of the given equation. To graph another equation, go to Equation → New Equation, and it gives another  $z=$ . If you want to graph something with a more complex written set-up, Equation → New Equation from Template may be of more use. There are several modes, like parametric, curves, and vectors. I've been using the parametric Cartesian surface equation for the most part.

The equation down the left side that is highlighted in blue also appears across the top and can be altered. To use math symbols not on the keyboard, the easiest way is to click the sigma symbol in the top right corner and choose from the drop-down menu. Otherwise, go to Window → Show Equation Palette to see much the same thing. Once you've got an equation, hit Enter. If Grapher likes the equation, it will put a box and checkmark next to it and graph it. Otherwise, it sets a yellow triangle with an exclamation mark next to it and doesn't graph it. This is the response I am getting most often. Clicking on the triangle will prompt it to give an explanation of what's wrong, something like "No valid operation found," which I have found singularly unhelpful. However, it basically means something is wrong and needs to change, because the program can't read it.

Grapher accepted the equation  $0=x^2+y^2+z^2$  (the unit circle), which apparently means it handles implicit equations, like DPGraph. To change the surface color, go to Window → Show Inspector. It can model height and orientation using color. (It may be able to model others, but I don't know how to make it do that.) It also has the options of making the figure hollow or showing contours.

I haven't been able to animate the graph the way DPGraph did; all I could figure out in Equation → Create Animation was how to rotate the perspective of the figure, which can already be accomplished with the scroll pad (not the arrow keys). Although there is an Animate Parameter option under Equation, it has remained stubbornly gray for me, not allowing me to select it.

If I have not explained something or said I couldn't make something work, that does not mean Grapher is incapable of doing something. It means that I, with my woefully inadequate computer skills could not figure out how to do so.