962-N1-304 **Bruce F. Torrence*** (`btorrenc@rmc.edu`), Dept. of Mathematics, P.O. Box 5005, Ashland, VA 23005-5505. *Mathematica Packages for the Visualization of Mathematical Ideas.*

I have created a number of custom Mathematica packages for the explicit purpose of visualization. I have focused on two design principles: (1) the commands must be easy for a student to use, and (2) the output must clearly and gracefully illustrate the concept in question. The topics cover a variety of mathematical ideas: There is a package that enables the student to produce a plot of any surface that is the solution to an equation in three variables. This enables the student to explore in an interactive way the relationship between an equation and the geometric surface it represents without having to solve for any one variable. Another animation tool illustrates the idea of least-squares regression. The student moves a line across any scatterplot and sees the "squares" of the residuals dynamically change size as the line moves. There is an animation illustrating the key idea in Archimedes' argument that the volumes of a double coneand a sphere (radius r) sum to the volume of a cylinder (cylinder & cone have height $2r$ and radius r on top and bottom). There is a simple tool for visualizing mathematical sequences, that makes the notion of convergence simple to communicate. It is also an excellent means of introducing the notion of chaos. (Received September 08, 2000)