

A Chemistry Primer for General Biology: Using the Macintosh™ to Present Text, Graphics, and Animations in a Lecture Setting

Steve Fifield and Richard W. Peifer

*General Biology Program, University of Minnesota,
P180 Kolthoff Hall, Minneapolis, MN 55455*

General Biology 1009 at the University of Minnesota—Twin Cities is required for students majoring in biology and many related fields. It can also be used to fulfil a science laboratory distribution requirement for students in fields outside the natural sciences. The course focuses at the molecular and cell levels early in the quarter. Because many of our students are inadequately prepared in basic chemistry, the course becomes a frustrating experience for some of them. A poor understanding of chemistry early in the course can hinder later learning and produce negative attitudes towards biology as a whole.

To assist students who lack adequate preparation in chemistry, we have developed a series of three presentations covering basic chemical concepts (e.g., atoms, elements, molecules, and bonding; energy and chemical reactions; and, macromolecules in biology). The presentations are offered outside the regularly scheduled lecture periods during the first week of each quarter and are open to all students in the course. Attendance is voluntary.

Our goal is to help students better understand the basics of chemistry, and to bridge the gap between real phenomena and the abstract representations so often used in science teaching. To make the presentations visually interesting and concrete we utilize the graphic and animation capabilities of the Macintosh computer and software. The presentations are in a lecture format and are accompanied by computer graphics organized in HyperCard™ or SuperCard™. The graphics are projected directly from the Macintosh and present text, illustrations, or animations. Both black and white, and color versions of the presentations have been developed. We use a Mac SE/30, Mac Data Display™ LCD panel, and overhead projector for the black and white version, and a Mac IICI and color video projector for the color version. Students also receive a lecture outline containing text and illustrations to help them follow along with the presentations.

Student reactions to the presentations have been very positive. Of the students attending the sessions during the academic year 1989–90, 84% thought that the computer-assisted instruction aided their understanding of the material.

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