

On-Line Manual Enhances Student Learning

*Arthur L. Buikema, Jr., William Zabaronick,
and Mary Alice Schaeffer*

Department of Biology
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061
540-231-6710
mschaeff@vt.edu

Arthur Buikema has been teaching Biology for 34 years. He received his PhD from the University of Kansas. He has won numerous teaching awards and has been recognized by the National Biology Teachers Association and the Society for Environmental Toxicology and Chemistry for his teaching contributions.

William Zabaronick is a Master's student in Molecular Biology at Virginia Tech developing a new technique to cultivate transgenic plants. He also has expertise in computer programming. He was able to translate the concept of the On-Line manual into fact in a very short time frame. He has visually enhanced the manual and has written programs to increase it's functionality.

Mary Schaeffer received her MS in Biology from Virginia Tech and is the laboratory coordinator for the freshman biology laboratory classes there. She implemented the manual and works with graduate teaching assistants and students using the manual.

Reprinted From: Buikema, A. L. jr., W. Zabaronick, and M. A. Schaeffer. 2000. On-line manual enhances student learning. Pages 436-437, *in* Tested studies for laboratory teaching, Volume 22 (S. J. Karcher, Editor). Proceedings of the 22nd Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 489 pages.

- Copyright policy: <http://www.zoo.utoronto.ca/able/volumes/copyright.htm>

Although the laboratory exercises in ABLE proceedings volumes have been tested and due consideration has been given to safety, individuals performing these exercises must assume all responsibility for risk. The Association for Biology Laboratory Education (ABLE) disclaims any liability with regards to safety in connection with the use of the exercises in its proceedings volumes.

©2001 Arthur L. Buikema, Jr., William Zabaronick, and Mary Alice Schaeffer

In 1998, the Biology Department at Virginia Tech instituted an On-Line Biology Laboratory Manual for Freshman Biology laboratory classes. This enables students to prepare for laboratory exercises prior to class and allows more class time for doing experiments and discussing the results. As most of our labs are two hours long, students previously only had time

to learn basic information pertaining to the lab, then they barely had time to complete our most involved exercises. We did not have a way to insist students read the lab beforehand, except to quiz them, which would take up even more class time. The on-line manual has improved the students' knowledge of basic concepts and less time is used in class explaining these concepts.

The on-line manual includes pre-laboratory quiz questions on material for the current week to ensure pre-laboratory preparation and also questions on material covered the week before. On-line tutorials of the pig dissection and fungi laboratory are used as study aids, allowing students to look at laboratory specimens outside of class to prepare for exams. Other tutorials give basic instruction on use of laboratory equipment. Additional features include an interactive food web exercise and data compilation for statistical analysis among many classes.

This on-line manual costs less than many published manuals, and funds computerization of the laboratories, updating computer systems, and personnel to develop teaching materials.

The URL for this site is <http://genbio.biol.vt.edu>. The current password for the manual may be obtained by calling 540-231-6710 or by emailing mschaeff@vt.edu.