

# THE AMERICAN BIOLOGY TEACHER

## Editorial Staff

Editor: William F. McComas  
Parks Family Professor of Science Education  
University of Arkansas  
ABTEditor@nabt.org

Assistant Editor: Kathleen Westrich  
Ronald Wilson Reagan College Preparatory H.S.  
kmwestrich@yahoo.com

Reviewing Editors: Kim Murie  
John Brown University  
KMurie@jbu.edu

Kevin Bonney  
New York University  
kevin.bonney@nyu.edu

Emily Weigel  
Michigan State University  
emilyweigel@gmail.com

Lance Forshee  
Oklahoma State University  
lance.forshee@okstate.edu

Managing Editor: Mark Penrose  
managingeditor@nabt.org

ABT Production Office: P.O. Box 3363  
Warrenton, VA 20188  
Phone: (888) 501-NABT  
Web site: www.nabt.org

Contributing Columnist: Douglas Allchin  
University of Minnesota  
allch001@umn.edu

## In Appreciation

Christine S. Chantry • 1952–2003

## Department Editors

Book Reviews: Amanda Glaze, aglaze@georgiasouthern.edu  
Classroom Materials & Media Reviews: Remy Dou, douremy@gmail.com

## Advertising Sales

Allison Zippert, Senior Account Executive, Network Media Partners  
(410) 584-1965, azippert@networkmediapartners.com

## Guidelines for Authors

Guidelines for authors may be found at  
<http://www.nabt.org/publications>

Printed by The Sheridan Press, on Forest Stewardship Council®-certified paper  
© 2017 National Association of Biology Teachers All rights reserved.

*The American Biology Teacher* (ISSN 0002-7685, e-ISSN 1938-4211) is published nine times a year (monthly except June and July, Nov/Dec combined) for the National Association of Biology Teachers in collaboration with University of California Press, 155 Grand Avenue, Suite 400. Oakland, CA 94612-3764. Periodicals postage paid at Oakland, CA, and additional mailing offices. POSTMASTER: Send address changes to ABT, University of California Press, 155 Grand Avenue, Suite 400. Oakland, CA 94612-3764. E-mail: customerservice@ucpress.edu.

*The American Biology Teacher* is the official peer-reviewed journal of the National Association of Biology Teachers. All manuscripts must be submitted online at <http://mc.manuscriptcentral.com/ucpress-abt>. The comments and opinions expressed in this publication are not attributed to and do not necessarily represent the views of the National Association of Biology Teachers. Announcements and advertisements in this journal for products do not imply endorsement of or by NABT.

## Membership Information

NABT membership is \$79 a year for full membership and \$149 for organizational membership in the United States, Canada, and Mexico; \$150 for full membership elsewhere. \$48 of annual membership dues applies to a subscription of *The American Biology Teacher*. Student, adjunct faculty and early career teacher memberships are \$35 and retired membership is \$60 (\$35 online only) if that person has been an NABT member for 10 years or more and is retired.

Subscriptions are offered on a calendar-year basis; members and subscribers receive all issues in the volume for the year in which their subscription is entered.

See <http://abt.ucpress.edu/content/subscriptions-and-single-issues> for single issue and institutional subscription orders, back issues from volume 69 forward, and claims information. Domestic claims for nonreceipt of issues should be made within 90 days of the mail date; overseas claims within 180 days. Mail dates can be checked at: <http://www.ucpress.edu/journals.php?p=release>. UC Press does not begin accepting claims for an issue until thirty (30) days after the mail date. For back issues before volume 69, contact NABT at [publication@nabt.org](mailto:publication@nabt.org).

Inquiries about advertising can be sent to [abt@networkmediapartners.com](mailto:abt@networkmediapartners.com). For complete abstracting and indexing coverage for the journal, visit <http://abt.ucpress.edu>. All other inquiries can be directed to [customerservice@ucpress.edu](mailto:customerservice@ucpress.edu).

**Copying and permissions notice:** Authorization to copy article content beyond fair use (as specified in Sections 107 and 108 of the U.S. Copyright Law) for internal or personal use, or the internal or personal use of specific clients, is granted by The Regents of the University of California on behalf of the National Association of Biology Teachers for libraries and other users, provided that they are registered with and pay the specified fee through the Copyright Clearance Center (CCC), [www.copyright.com](http://www.copyright.com). To reach the CCC's Customer Service Department, phone 978-750-8400 or write to [info@copyright.com](mailto:info@copyright.com). For permission to distribute electronically, republish, resell, or repurpose material, use the CCC's Rightslink service, available on JSTOR at <http://abt.ucpress.edu>. Submit all other permissions and licensing inquiries through University of California Press's Reprints and Permissions web page, <http://www.ucpress.edu/journals.php?p=reprints> or via email [jpermissions@ucpress.edu](mailto:jpermissions@ucpress.edu).

For more information, visit [www.nabt.org](http://www.nabt.org)

## Executive Director

Jaclyn Reeves-Pepin

## Board of Directors

President: Susan Finazzo  
President-Elect: Elizabeth Cowles  
Past President: Bob Melton  
Secretary/Treasurer: Steven Christenson  
Director-at-Large: Sherry Annee  
Director-at-Large: Margaret Carroll  
Director/Coordinator: Cindy Gay  
Director/Coordinator: Brenda Royal

## Regional Coordinators

Region I (CT, ME, MA, NH, RI, VT): Margaret Carroll  
Region II (DE, DC, MD, NJ, NY, PA, VA): Karen Lucci  
Region III (IL, IN, MI, OH, WI): Kevin English  
Region IV (IA, KS, MN, MO, NE, ND, SD): Lin Andrews  
Region V (KY, NC, SC, TN, WV): Brenda Royal & Kim Sadler  
Region VI (AL, FL, GA, LA, MS, PR): Madelene Loftin  
Region VII (AZ, AR, NM, OK, TX): Julie Angle



Region VIII (CO, ID, MT, NV, UT, WY): Cindy Gay  
Region IX (AK, CA, HI, OR, WA, Pacific Territories): Bethany Dixon  
Region X (Canadian Provinces & Territories): TBD

## Committee Chairs

ABT Journal Advisory Committee: William F. McComas  
Archival Committee: Carrie Bucklin & Jill Maroo  
Awards Committee: Jason Crean  
Finance Committee: Steve Christenson  
Honorary Membership Committee: Elizabeth Cowles  
Global Perspectives Committee: TBD  
Member Resources Committee: Sherry Annee  
Nominating Committee: Donald French  
Professional Development Committee: Kristina Nicosia  
Retired Members Committee: Dennis Gathmann

## Section Chairs

AP Biology Section: Mark Little  
BioClub Section: Chris Monsour  
Four-Year College & University Section: Anna Hiatt  
Two-Year College Section: Lindsey Carter