

THE AMERICAN BIOLOGY TEACHER



About Our Cover

Ferns are classified in the phylum Pteridophyta, which includes all seedless vascular plants. True ferns are commonly referred to as the "monilophytes." Ferns are an exceptionally diverse and ancient group of plants, with fossils dating to >300 million years ago and with >12,000 identified species. Fern morphology is also diverse, with fern fronds ranging from fractions of an inch to >12 feet in length. The term *frond* refers to the entire fern leaf, which is composed of smaller leafy extensions called *blades*, and the *stipe* is the leafy stalk that connects each of the blades.

Ferns are often studied in biology courses for their interesting life cycle, which involves spores and no seed or flower production. Spores produced by the fern form tiny plants called *prothallia*, which then produce the male and female gametophytes for reproduction. The cover photo was taken along the Appalachian Trail during a two-week outdoor camping and hiking excursion with college students on the final day of a hike down Mt. Rogers, the highest point in Virginia. Students participate in this event as part of field biology, survival, and creative writing courses. After 8 of 12 miles into the day's hike, the photographer noticed the shaft of sunlight shining through a thick stand of trees onto the small fern pictured here. With some cooperation from the sun and clouds, it took about 10 minutes to capture this image. The photo was taken by Bob Remedi from College of Lake County in Grayslake, Illinois, using a handheld Canon EF 100 F2.8L macro lens mounted on a Canon 50D set for ISO 100 and 1/500.

Contents

Feature Articles

- Ebola Epidemic: Using Current Events to Teach Authentic Inquiry Science**
Engaging students in a series of inquiry-based lessons on the current outbreak in West Africa
Houda Darwiche, Julie R. Bokor 190
Available online at <http://www.nabt.org/websites/institution/index.php?p=762>
- Opening Access to STEM Experiences One Day at a Time: Successful Implementation of a School-wide iSTEM Day**
Creating an integrated STEM education experience for local eighth-graders
Georgia Hodges, Sophia Jeong, Peggy McKay, Tom Robertson, David Ducrest 200

Research on Learning

- Using WISE Materials to Design an Inquiry-Based Curriculum with the 5E Instructional Model**
Supporting student participation with online inquiry, cooperative learning & role-playing
Xin Fu, Enshan Liu 208

Inquiry & Investigation

- Deriving Population Growth Models by Growing Fruit Fly Colonies**
Using mathematical reasoning to derive population growth models
Aaron J. Heaps, Tyler D. Dawson, Jace C. Briggs, Megan A. Hansen, Jamie L. Jensen 221
- Do You See What I See? Using Ethograms to Observe Animal Behavior**
Observing grass shrimp in aquaria and constructing an ethogram to determine how changes in environment alter behavior
Mary Carla Curran, Amber Siler, and Michele B. Sherman 226
- Bean Beetles Make Biology Research Sexy**
Engaging students in class-based research related to sexual reproduction, selection, orientation & operational sex ratios
Sehoya Cotner, Sadie Hebert 233
- When Chinese Masks Meet Phylogenetics**
Demonstrating the task of character coding and its importance in phylogenetic systematics
Claudia A. M. Russo, Bárbara Aguiar, Carolina M. Voloch, Alexandre P. Selvatti 241



Tips, Tricks & Techniques

- Deconstructing a Popular Science Book: Fresh Take on the Book Report**
Developing students' ability to grasp how experiments serve as evidence in scientific discourse
Annie Prud'homme-Généreux 248
- Replication Rhumba & Translation Tango: Active Learning Exercises for Introductory Biology**
By modeling molecular processes with their bodies, students perceive the three-dimensional nature of these processes
Janice Voltzow 254
- How Does Oral Hygiene Affect Bacterial Counts in Saliva?**
Exploring microbes in your own saliva
Gretchen L. Geiger-Thornsberry 258
- Using Great Ape Phylogeny to Teach Evolutionary Thinking**
A simple but accurate tree helps develop the general skill of reading phylogenetic trees
Susan Offner 263



Departments

- Guest Editorial** • *The Empowerment of Evolution Education: Teaching about Evolution Is Teaching with Social Justice in Mind* • David Upegui 183
- Letter to the Editor** 185
- Editorial** • *Thank You, ABT Reviewers* • William F. McComas 187
- Book Reviews** • Elizabeth Cowles, Department Editor 268