

# THE AMERICAN BIOLOGY TEACHER



## About Our Cover

The only large spotted cat in the New World and the third largest feline in the world is the jaguar (*Panther onca*). Jaguars are found throughout a wide variety of habitats in the Neotropics from Central America to Argentina but have lost much of their traditional range because of deforestation and actions of farmers.

Jaguars vary in size from 110 to 185 cm in body length and in color from dark brown or black to the more common tawny variety. Interestingly, all jaguars, including the melanistic ones, have spots that may be seen when viewed from the proper angle. These felines breed year-round and can give birth up to four cubs but most commonly two.

The magnificent animal pictured here is "Junior Buddy" who resides in the Belize Zoo where jaguars are locally known as "tigers." Buddy was born at the zoo of a mother brought in by local farmers who captured her for killing their sheep.

Although almost half of the traditional jaguar range in Belize is gone, conservationists and government officials have established a large tract of land as a jaguar preserve, which includes three large connecting corridors, so jaguars can travel throughout almost the entire country. This increases their chance for species survival through interbreeding and the resultant increase in genetic variability. Junior Buddy is considered by the Zoo a "conservation icon" on exhibit to help acquaint locals and visitors alike with the plight and promise of large mammals living in tandem with humans.

This digital image was recorded with a Nikon D800 camera using an 18-200-mm zoom lens set for 85 mm at f5 1/100<sup>th</sup> second ISO 640 with VR image stabilizing technology. The photographer is William F. McComas, the Parks Family Professor of Science Education at the University of Arkansas (mccomas@uark.edu) and the *ABT* editor.

## Contents

### Feature Article

#### Genetic Dominance & Cellular Processes

*Understanding that dominance is not a mechanism, but rather a consequence of underlying cellular processes*  
Robert D. Seager ..... 576  
Available online at ..... <http://www.nabt.org/websites/institution/index.php?p=730>

### Research on Learning

#### Helping Graduate Teaching Assistants in Biology Use Student Evaluations as Professional Development

*Teaching techniques and interpersonal rapport best predicted student ratings of GTA teaching effectiveness*  
K. Denise Kendall, Matthew L. Niemiller, Dylan Dittrich-Reed, Elisabeth E. Schussler ..... 584

### Inquiry & Investigation

#### Studying Plant–Rhizobium Mutualism in the Biology Classroom: Connecting the Big Ideas in Biology through Inquiry

*Teaching basic scientific methods and the four "big ideas" through study of the legume–rhizobium system*  
Tomomi Suwa, Brad Williamson ..... 589

RECOMMENDED  
FOR AP Biology

#### Using a Combined Approach of Guided Inquiry & Direct Instruction to Explore How Physiology Affects Behavior

*Learning how nutrition affects the physiology and behavior of the common housefly*  
Erika T. Machtinger ..... 595

#### How Do Small Things Make a Big Difference? Activities to Teach about Human–Microbe Interactions

*Learning and applying ecological concepts to see how the human body is a complex ecosystem*  
Chandana Jasti, Barbara Hug, Jillian L. Waters, Rachel J. Whitaker ..... 601

#### Investigating Issues in the Laboratory: The Behavior of Red Swamp Crayfish as an Invasive Species

*Integrating the concepts of animal behavior and population biology into an issue of both local and global relevance*  
Krissi M. Hewitt, Lori J. Kayes, David Hubert, Adam Chouinard ..... 609

#### The Scene of the Crime: Classroom Integration of Biosafety, Microscopy & Forensics

*Improving student skills through forensic microscopy also advances student retention of biosecurity requirements*  
Michelle L. Green, Jan Novakofski, Ryan W. Green, Mary Beth Manjerovic, Nohra Mateus-Pinilla ..... 615

MARY  
BioClub  
RECOMMENDATION

### Tips, Tricks & Techniques

#### Reading to Understand Anatomy: A Literature Circle Approach

*Learning how to critically analyze and discuss science text using the LC format*  
Joseph Calmer, William Straits ..... 622

#### Enhancing Science Instruction through Student-Created PowerPoint Presentations

*Allowing students to develop multimedia presentations encourages technology use and reinforce content learned in class*  
Leona Gerido, Mary Carla Curran ..... 627

### Departments

**Guest Editorial • Physiology – Still the One!** • Patricia E. Molina, David M. Pollock, Kim E. Barrett ..... 572

**Book Reviews** • Elizabeth Cowles, Department Editor ..... 633

**Classroom Media Reviews** • Remy Dou, Department Editor ..... 637

**Sacred Bovines • Organisms, Modified, Genetically** • Douglas Allchin, Department Editor ..... 639

**2014 Index to Volume 76 of *The American Biology Teacher*** ..... 643

**Index to Advertisers** ..... 648