Activities and Investigations

In this issue:
- Noodling for Mollusks
- Chemistry Cook-off
- A Hidden Gem
This issue’s theme: ACTIVITIES AND INVESTIGATIONS

COVER
Challenge students in the classroom with this issue’s mix of activities and investigations. Whether “noodling” for mollusk shells, simulating hereditary mutations, competing in a cooking contest, testing rates of porosity and permeability in different samples, or using online tools to explore global warming, students will engage in active learning. Integrating content with activities and investigations in a planned and purposeful way can be difficult for teachers. This issue is full of ideas that can help.

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MAKE YOUR OWN

PHYLOGENETIC TREE

A SIMULATION activity to...
HELP STUDENTS BETTER UNDERSTAND PHYLOGENY & MOLECULAR SIMILARITY.

Gerald Rau
From Cookbook to Inquiry

In this issue:

- Eight ways to do inquiry
- Now you’re cooking!
- A virtual tour of plate tectonics
This issue's theme: FROM COOKBOOK TO INQUIRY

COVER
Inquiry activities engage students in scientific phenomena through direct observation, data gathering, and analysis of evidence. Replacing familiar routines—sometimes referred to as "cookbook" labs—with inquiry may seem daunting. But as explained in this issue, not all inquiry activities are the same. One article describes four levels of inquiry: confirmatory, structured, guided, and open. Another recommends eight types of inquiry activities based on a study of more than 300. A third article describes an inquiry involving Google Earth. The "Idea Bank" column shows how to add inquiry to popular cookbook labs. Use these ideas to enhance your own ability to implement inquiry in your teaching.

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LIBRARY SERIALS
AUG 2 3 2012
UNIVERSITY OF CALIFORNIA RIVERSIDE LIBRARY

NSTA National Science Teachers Association
This issue's theme: TEACHING THE BIG IDEAS OF SCIENCE

Cover
Science curricula are often criticized for being a mile wide and an inch deep. The result can be a frenetic race through disconnected topics. Both the recently released public draft of the Next Generation Science Standards and A Framework for K–12 Science Education therefore focus on a limited number of core ideas and crosscutting concepts—that is, the Big Ideas of science. The Big Ideas are generalizable—able to unify a wide range of scientific facts. Teaching every concept in the context of some larger Big Idea provides coherence across the science curriculum.

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In this issue:
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• Teaching with gravel
This issue's theme:
CRITICAL THINKING

COVER
If students don't develop the habit of critical, analytical thinking, they will never achieve meaningful understanding. A head full of scientific facts and ideas is not enough: The ability to think critically gives these ideas meaning and allows them to flourish and grow. This issue of The Science Teacher suggests ways to incorporate critical thinking in your classroom—through gravel investigations, error analysis, and unsolved mysteries.


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Science and Engineering

In this issue:
- Drama in the science classroom
- The Friendship Detector
- Mendel’s modern legacy
This issue's theme: SCIENCE AND ENGINEERING

COVER
Though science, technology, and mathematics all have advocates in the public and private sectors, engineering is often left behind. But virtually all of the challenges that face our nation and planet require engineering solutions. This issue of The Science Teacher focuses on training our next generation of engineers through problem-based scenarios, design challenges, complex circuits, and more.

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The Dynamic Earth

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This issue's theme: THE DYNAMIC EARTH COVER

From earthquakes to volcanoes to tornadoes, planet Earth has certainly been making headlines lately. Each occurrence renews our appreciation of the forces of nature and our responsibility to provide students with deep scientific understanding of these powerful and tragic events. This issue of The Science Teacher is dedicated to The Dynamic Earth and the teachable moments it creates.

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Science Fairs

In this issue:

- A New Look at an Old Tradition
- The Judge’s Perspective
- Students Inspiring Students
This issue's theme: SCIENCE FAIRS

COVER
Science fairs have long been a part of American culture, providing students with the opportunity to experience the excitement of scientific discovery. Major fairs and competitions are sponsored by businesses, industries, and other institutions, and regional competitions are available at the school, community, and state levels. This issue of The Science Teacher shares students' perspectives on research projects, suggests strategies for improving the problem-finding process, and provides judges' tips for success in science fairs.

Cover designed by Joseph Butera. Photos courtesy of Guest Editor William F. McComas.

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21st-Century Tools

In this issue:
- Tools for the oral presentation
- An urban ecology curriculum
- Teaching with popular literature
This issue's theme: 21st-CENTURY TOOLS

COVER
In the rush of daily life and work in the 21st century, it's easy for teachers to get wrapped up in grades, lesson plans, meetings, e-mail, and day-to-day business. But it's important to occasionally step back and address questions such as, "Are we preparing students for the world they will face upon graduation and beyond?" This issue of The Science Teacher is your guide to the 21st-Century Tools that can not only help prepare students for the modern workplace and world but also provide them with a solid understanding of science content.

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*The Science Teacher* has gone digital!

Check us out on Facebook at www.nsta.org/TST/Facebook or follow us on Twitter @TST_NSTA.
Motivating and Engaging Students: Teaching Today’s Teenagers

In this issue:
- Popular movies in science
- Avatar-based ecosystems
- Creative dinosaur projects
This issue's theme:

MOTIVATING AND ENGAGING STUDENTS: TEACHING TODAY'S TEENAGERS

COVER

Outside our classrooms, students are awash in sensory experiences. They are on Facebook, on their cell phones, on the internet, or in front of the TV. They text, tweet, play video games, listen to music. The list goes on and on. How can you compete with all that? This issue of The Science Teacher is your guide to motivating and engaging students, using some of these very tools. Read on for more ideas on teaching today's teenagers!

Cover designed by Joe Butera. Images provided by iStock.

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In this issue:
- Teaching strategies for ELLs
- Family science
- Improving science vocabulary for all

Plus!
The 2010 Outstanding Science Trade Books List
This issue's theme:
SCIENCE FOR ALL

COVER
This issue of The Science Teacher marks our 16th annual issue devoted to the theme of "Science for All." Ideas for reaching out to underrepresented groups are more important than ever, as classrooms become increasingly diverse. This theme serves as an umbrella for ideas and strategies to narrow the academic achievement gaps associated with ethnicity, socioeconomic status, gender, physical disabilities, limited English-language proficiency, and learning differences.

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Look for the sCILINKS icon throughout the issue for web links to accurate, age-appropriate content and pedagogy.

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• The Yellowstone wolf debate
• Solving the Rubik's cube
• CAT scans, MRIs, and x-rays

Science Teachers Association
This issue's theme: ACTIVITIES AND INVESTIGATIONS

**COVER**
Challenge your students with this issue's mix of activities and investigations. From debating the protection of Yellowstone wolves to exploring pollution in the Hudson River, this issue of *The Science Teacher* is full of ideas for your classroom.

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New Web Tools and Technology

In this issue:
- New column: The Green Room
- Cyberlearning in science
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This issue's theme: NEW WEB TOOLS AND TECHNOLOGY

COVER
This issue of The Science Teacher is devoted to new technologies that have radically altered learning. From videos about bacterial transformation to virtual laboratories, technology has the potential to transform science education—just as it has transformed our personal lives. Read on for suggestions on how to incorporate technology in your classroom.

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Creativity in the science classroom? Of course! This issue provides a host of activities to foster creative thinking in your classroom. Students will solve genetics problems, make microbe models, and work behind cardboard dividers—all while thinking critically and creatively.

This issue also launches our newest column: The New Teacher’s Toolbox. In this column, one teacher shares some insight from his first years of teaching—and some tips to help new (and even veteran) teachers along the way. Read the debut column, on helping new teachers survive their first day of school, in this issue!

This issue of The Science Teacher provides you with recommendations for your summer reading, as well as tips and activities to help you prepare for the upcoming school year. From first-day lesson plans to oral histories and virtual labs, we hope these resources will make for an even better year ahead. So sit back, read up, and enjoy your summer!

This issue of The Science Teacher continues our tradition of devoting one issue each year to partnerships that connect students, teachers, and their communities. Science activities that take students outside school walls combine the best aspects of community service, project-based learning, and lessons in good citizenship. The community collaborations described in this issue provide rich learning and service opportunities for teachers and
Ideas for reaching out to underrepresented groups are more important now than ever, as our classrooms become increasingly diverse. This issue of *The Science Teacher* marks our 15th annual issue devoted to the theme of “Science for All.” This theme serves as an umbrella for ideas and strategies to narrow the academic achievement gaps associated with ethnicity, socioeconomic status, gender, physical disabilities, limited English language proficiency, and learning differences.

This issue of *The Science Teacher* is devoted to all things green. Environmental education is critically important in today’s classrooms. From making greener root beer to investigating dead zones, the activities in this issue encourage environmental awareness and teach important science concepts. So read on and “go green” in your science classroom today!

In the modern world, literacy involves more than just reading and writing. Students must be able to think critically about a text—no matter its form. This issue provides ideas and activities to help strengthen students’ literacy skills in the science classroom—and beyond. From field-note poetry to lab reports to reading widely, these activities will help you incorporate