SPECIAL SECTION

Science, Language, and Literacy

INTRODUCTION
447 Learning to Read, Reading to Learn

PERSPECTIVES
448 Science Education and Literacy: Imperatives for the Developed and Developing World
P. Webb
450 Academic Language and the Challenge of Reading for Learning About Science
C. E. Snow

REVIEWS
453 Using Texts in Science Education: Cognitive Processes and Knowledge Representation
P. van den Broek
456 Supporting Students in Developing Literacy in Science
J. S. Krajcik and L. M. Sutherland
459 Literacy and Science: Each in the Service of the Other
P. D. Pearson et al.
463 Arguing to Learn in Science: The Role of Collaborative, Critical Discourse
J. Osborne
>

EDITORIAL
405 Prioritizing Science Education
Bruce Alberts

>> Science, Language, and Literacy section p. 447

NEWS OF THE WEEK
410 Iceland Eruptions Fuel Interest in Volcanic Gas Monitoring
413 Human Ancestor Caught in the Midst of a Makeover
414 Along With Power, Questions Flow at Laos’s New Dam
414 Max Planck Tests the Korean Waters
415 From the Science Policy Blog
416 Pioneering Geophysicist Tackles Newest Challenge
417 Congress Moves Toward Strengthening EPA’s Hand on Chemical Safety

>> Science’s Online Daily News Site

NEWS FOCUS
418 A Groundbreaking Observatory to Monitor the Environment
>
>> Science Podcast
421 Imponderables Complicate Hunt for Intelligent Life Beyond Earth
422 A Sense of Crisis as China Confronts Ailments of Affluence
424 Unprecedented Excavation Brings Maritime Silk Road to Life

LETTERS
427 Unconventional Journals: Research Ramifications
G. N. Vyas
Unconventional Journals: Protect Nonconformists
O. S. Amit
Readers’ Poll: Unconventional Journals

>> Science, Language, and Literacy section p. 447

BOOKS ET AL.
430 Complexity
M. Mitchell, reviewed by I. D. Couzin
431 When Languages Die
K. D. Harrison, reviewed by A. Pires

EDUCATION FORUM
433 Assessing Literacy Across a Changing World
A. Schleicher

>> Science, Language, and Literacy section p. 447

COVER
Children learning science, like these 7-year-olds tackling nuclear physics in 1948, must work through their mistakes and misconceptions. The route to science literacy involves reading, debate, presentation, and writing. See the special section beginning on page 447.

Photo: Nina Leen/Time Life Pictures/Getty Images

CONTENTS continued >>

DEPARTMENTS
403 This Week in Science
406 Editors’ Choice
408 Science Staff
409 Random Samples
515 New Products
516 Science Careers
PERSPECTIVES
435 Escaping Attention
T. Grüter and C.-C. Carbon
436 Syntheses That Stay Together
J. W. Roberts
>> Reports pp. 501 and 504
437 Toward Understanding and Predicting Monsoon Patterns
E. R. Wahl and C. Morrill
>> Report p. 486
439 Salmonella Susceptibility
S. Moir and A. S. Fauci
>> Report p. 508
440 The Case for Plasmonics
M. L. Brongersma and V. M. Shalaev
441 Sign Flips and Spin Fluctuations in Iron High-Tc Superconductors
J. E. Hoffman
>> Report p. 474
443 People, Societies, and Landscapes
C. French
BREVIA
469 Genotype to Phenotype: A Complex Problem
R. D. Dowell et al.
In yeast, the impact of gene knockouts depends on genetic background.
470 Molecular Basis of Alternating Access Membrane Transport by the Sodium-Hydantoin Transporter Mhp1
T. Shimamura et al.
Three complementary crystal structures reveal the mechanism of a transport protein in molecular dynamics simulations.
RESEARCH ARTICLE
474 Unconventional s-Wave Superconductivity in Fe(Se,Te)
T. Hanaguri et al.
The electronic gap in an iron-based superconductor has spherically symmetric components that change sign.
>> Perspective p. 441
476 Mechanism and Kinetics of Spontaneous Nanotube Growth Driven by Screw Dislocations
S. A. Morin et al.
Low supersaturated conditions help control the growth of zinc oxide nanowires and nanotubes from defect sites.
480 Monolithic Carbide-Derived Carbon Films for Micro-Supercapacitors
J. Chmiola et al.
The power density of small-scale capacitors can be increased by using monolithic carbon films.
483 Constraints on the Formation Age of Cometary Material from the NASA Stardust Mission
J. E. P. Matzel et al.
Transport of inner solar system material to the Kuiper Belt and incorporation into comets took at least 2 million years.
486 Asian Monsoon Failure and Megadrought During the Last Millennium
E. R. Cook et al.
Tree-ring data from more than 300 locations provide a 700-year-long record of monsoon variability throughout Asia.
>> Perspective p. 437; Science Podcast
490 Onset of Convective Rainfall During Gradual Late Miocene Rise of the Central Andes
C. J. Poulsen et al.
Increased precipitation, rather than rapid uplift, drove isotopic changes in soil carbonates of the Andes in the late Miocene.
Complexity and Diversity
M. Doebeli and I. Ispolatov
Eco-evolutionary models of selection acting on multiple traits show how rare alleles can establish and drive speciation.
Stoichiometry and Architecture of Active DNA Replication Machinery in Escherichia coli
R. Reyes-Lamothe et al.
Single-molecule fluorescence microscopy reveals the organization of the replisome in living bacterial cells.
A NusE:NusG Complex Links Transcription and Translation
B. M. Burmann et al.
Cooperation Between Translating Ribosomes and RNA Polymerase in Transcription Elongation
S. Proshkin et al.
The ribosome pushes RNA polymerase to prevent backtracking, which links rates of translation with transcription.
>> Perspective p. 436
Dysregulated Humoral Immunity to Nontyphoidal Salmonella in HIV-Infected African Adults
C. A. MacLennan et al.
Abnormal antibody responses produced in HIV-infected individuals are ineffective at clearing food-poisoning bacteria.
>> Perspective p. 439
Teacher Quality Moderates the Genetic Effects on Early Reading
J. Taylor et al.
Good teachers allow children to achieve their genetic potential; poor teachers do not.
>> Science, Language, and Literacy section p. 447; Science Podcast
CONTENTS continued >>
An improved system can distribute numerical “keys” for scrambling messages at megabit disk of microscopic debris. Disintegrating comets generate the solar system’s study finds. A breed’s temperament affects its longevity, Good Dogs Live Longer. Researchers Solve the Mystery of the Zodiacal Light. Disintegrating comets generate the solar system’s disk of microscopic debris. Quantum Cryptography Hits the Fast Lane. An improved system can distribute numerical "keys" for scrambling messages at megabit.