# Investing Early in Education

## INTRODUCTION

Laying the Foundation for Lifetime Learning

### NEWS

- 952 Past Successes Shape Effort to Expand Early Intervention
- Giving Children a Head Start 956 Is Possible—But It's Not Easy
- A Passion for Early Education

# **REVIEWS**

**EDITORIAL** 

Interventions Shown to Aid **Executive Function Development** in Children 4 to 12 Years Old A. Diamond and K. Lee

919 Getting Education Right

>> Education section p. 951

922 A roundup of the week's top stories

**NIH Uncovers Racial Disparity** 

Science Careers article p. 917

>> Policy Forum p. 940; Report p. 1015;

U.S. Icebreaking Woes Threaten

Into the Stretch for Science's

Point Man on Doomsday

McMurdo Resupply, Research Plans

Bruce Alberts

**NEWS OF THE WEEK** 

**NEWS & ANALYSIS** 

in Grant Awards

A Minority Viewpoint

Teachers' Language Practices and Academic Outcomes of Preschool Children D. K. Dickinson

- **Early Childhood Mathematics** Intervention D. H. Clements and J. Sarama
- **Educational Interventions to Advance** Children's Scientific Thinking
- D. Klahr et al. Effectiveness of Early
- 975 **Educational Intervention** W S Barnett
- From Science to Policy in Early Childhood Education W. T. Gormley Jr.

# **EDUCATION FORUM**

- Protecting Brains, Not Simply Stimulating Minds J. P. Shonkoff
- >> Editorial p. 919; Science Careers content p. 917; and www.sciencemag.org/special/education2011/

# **NEWS FOCUS**

- A Distant Glimpse of Alien Life?
- Drug Developers Finally Take Aim at a Neglected Disease

#### LETTERS

- Invasives: Sea of Data Still to Come 936 A. C. Marques
  - Invasives: Classify with Care C. Moore
  - Ecosystem Rates of Transformation Matter
  - M. Winter and O. Schweiger
  - Response
  - D. A. Wardle et al.
  - Museums and Archives in Peril
  - W. A. Lovis
- CORRECTIONS AND CLARIFICATIONS

**PERSPECTIVES Aneuploidy Drives a Mutator** Phenotype in Cancer

page 930

**Engineering Animals** 

M. Denny and A. McFadzeon, reviewed by A. A. Biewener

Weaving a Richer Tapestry

in Biomedical Science

L. A. Tabak and F. S. Collins

T. Hanson, reviewed by P. Stettenheim

>> News story p. 925; Report p. 1015; Science Careers article p. 917

BOOKS ET AL.

Feathers

POLICY FORUM

>> Reports pp. 1026 and 1039 Quantifying Malaria Dynamics

R. D. Kolodner et al.

- Within the Host K. P. Day and F. J. I. Fowkes >> Research Article p. 984
- The Adjuvant Effects of Antibodies M. J. Smyth and M. H. Kershaw >> Report p. 1030
- **CNCing Is Believing** G. A. Wray >> Report p. 1019
- Taking the Pulse of Molecular Rotational Spectroscopy B. H. Pate >> Report p. 1011

CONTENTS continued >>

- >> Science Podcast
- A Tropical Disease Hits the Road



INVESTING EARLY IN LIDE

MAAAS

# COVER

Prior to beginning formal schooling, young children can learn a great deal, forming affiliations with favorite topics and experiences. What are these children best able to learn? What value does this early learning hold for later-life experiences? The special section beginning on p. 951 focuses on science that can guide decisions about when, how, and what to teach in these early years.

Image: Fotosearch/iStockphoto.com



This Week in Science 918

Editors' Choice

Science Staff

**New Products** 

1045 Science Careers



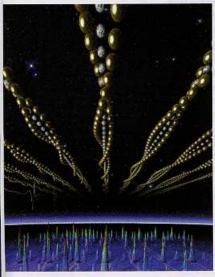




pages 925, 940, & 1015



pages 944 & 1030



pages 947 & 1011

# RESEARCH ARTICLES

984 Partitioning Regulatory Mechanisms of Within-Host Malaria Dynamics Using the Effective Propagation Number C. J. E. Metcalf et al.

As malaria progresses, red blood cell availability and immune control change depending on the initial dose of parasites.

>> Perspective p. 943

988 A Large and Persistent Carbon Sink in the World's Forests Y. Pan et al. Net average global annual uptake of atmospheric carbon dioxide by forests was 1.1 petagrams of carbon, roughly one-sixth of fossil fuel emissions.

#### REPORTS

993 Detection of Emerging Sunspot Regions in the Solar Interior
S. Ilonidis et al.
Helioseismic observations allow the detection of sunspots before they emerge at the surface of the Sun.

Quantum Simulation of Frustrated
Classical Magnetism in Triangular
Optical Lattices
J. Struck et al.
An optical lattice of trapped atoms provides a tractable and tunable setup to study complex magnetic interactions.

999 Visualizing Individual Nitrogen Dopants in Monolayer Graphene
L. Zhao et al.
Nitrogen atoms that replace carbon atoms in the graphene lattice strongly modify the local electronic structure.

1003 Guided Growth of Millimeter-Long
Horizontal Nanowires with Controlled
Orientations
D. Tsivion et al.
Long, horizontal gallium nitride nanowires
are controllably grown on different faces

of a sapphire substrate.

electrodes.

Five Lithium Cations Jammed Between
Two Corannulene Tetraanion Decks
A. V. Zabula et al.
Characterization of the lithium-ion
arrangement between two carbon sheets
may ultimately aid in the design of battery

1011 CRASY: Mass- or Electron-Correlated
Rotational Alignment Spectroscopy
C. Schröter et al.
A technique merging rotational spectroscopy
with mass spectrometry facilitates analysis
of a complex isotopic mixture.
>> Perspective p. 947

1015 Race, Ethnicity, and NIH Research Awards
D. K. Ginther et al.
NIH research project grants from 2000 to
2006 show evidence of racial/ethnic
disparities in the probability of receiving
an award.
>> News story p. 925; Policy Forum p. 940;
Science Careers article p. 917

1019 Three Periods of Regulatory Innovation
During Vertebrate Evolution
C. B. Lowe et al.
Patterns of vertebrate gene regulation have changed during the course of evolution.
>> Perspective p.: 946

Rapid Range Shifts of Species Associated with. High Levels of Climate Warming I.-C. Chen et al.

A meta-analysis shows that species are shifting their distributions in response to climate change at an accelerating rate.

>> Science Podcast

1026 Aneuploidy Drives Genomic Instability in Yeast
J. M. Sheltzer et al.
Extra chromosomes cause general genomic instability in yeast.
>> Perspective p. 942; Report p. 1039

1030 Inhibitory Fcγ Receptor Engagement
Drives Adjuvant and Anti-Tumor Activities
of Agonistic CD40 Antibodies
F. Li and J. V. Ravetch
Engagement of an inhibitory receptor
improves the anti-tumor efficacy of a
monoclonal antibody.
>> Perspective p. 944

1034 An Interaction-Based Approach to Enhancing Secondary School Instruction and Student Achievement J. P. Allen et al. "Just the facts" is not enough. >> Science Podcast

1037 Graduate Students' Teaching Experiences
Improve Their Methodological
Research Skills
D. F. Feldon et al.
Teaching is not wasted time.

O39 Mutational Inactivation of STAG2 Causes Aneuploidy in Human Cancer D. A. Solomon et al. Tumors harbor mutations that disrupt chromatid separation during cell division, leading to chromosomal abnormalities.

>> Perspective p. 942; Report p. 1026