

# NIH Office of Science Education



**Bruce A. Fuchs, Ph.D., Director**  
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**Division of Program Coordination, Planning,  
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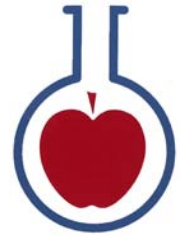
**<http://science.education.nih.gov>**



National Institutes of Health  
OFFICE OF  
**science** education



# President Obama's Goal



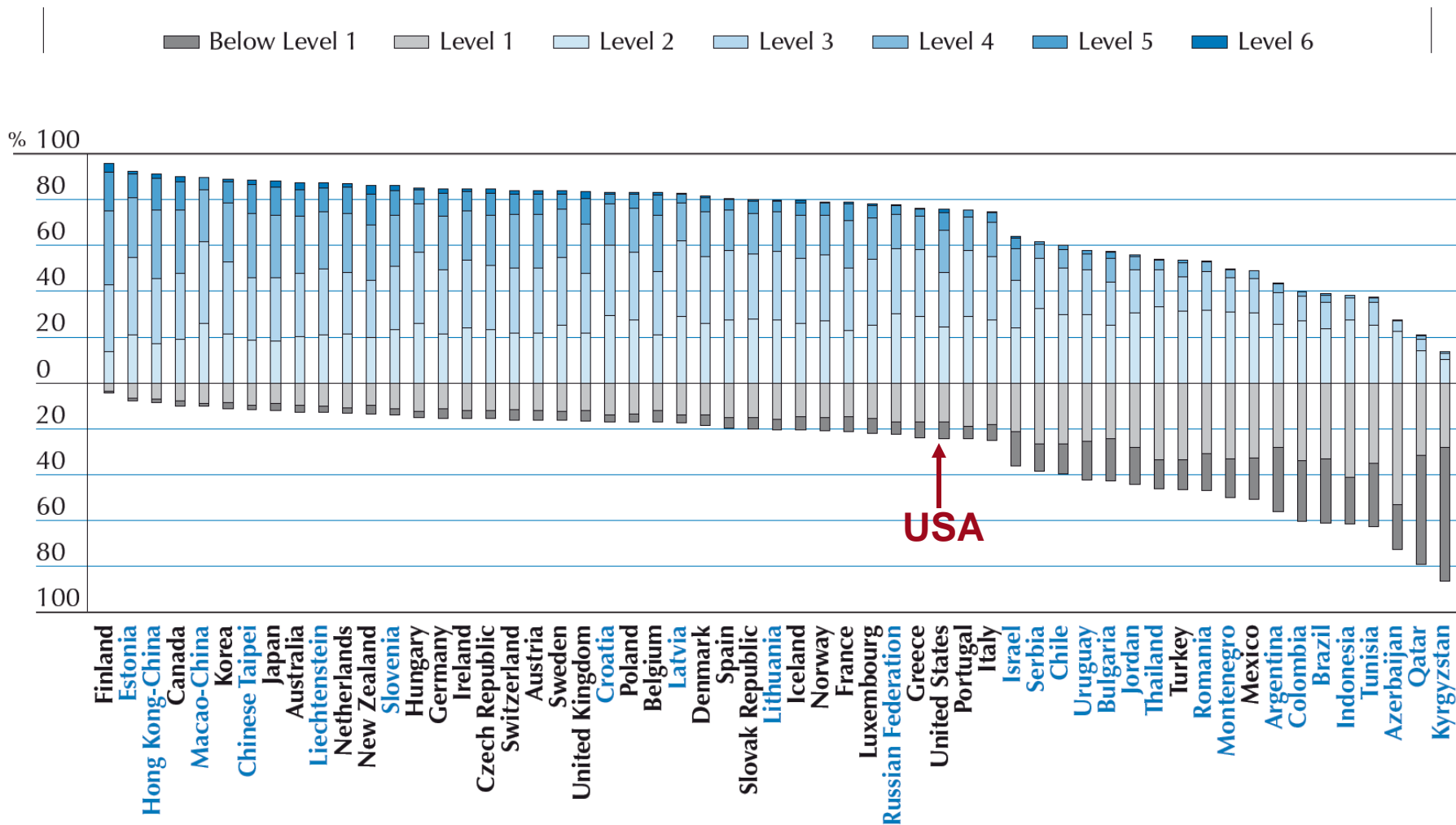
- “...make no mistake: Our future is on the line. The nation that out-educates us today is going to out-compete us tomorrow. To continue to cede our leadership in education is to cede our position in the world....my administration has set a clear goal: to move from the middle to the top of the pack in science and math education over the next decade.”



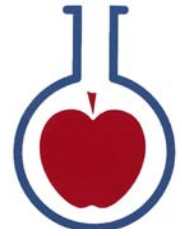
January 6, 2010



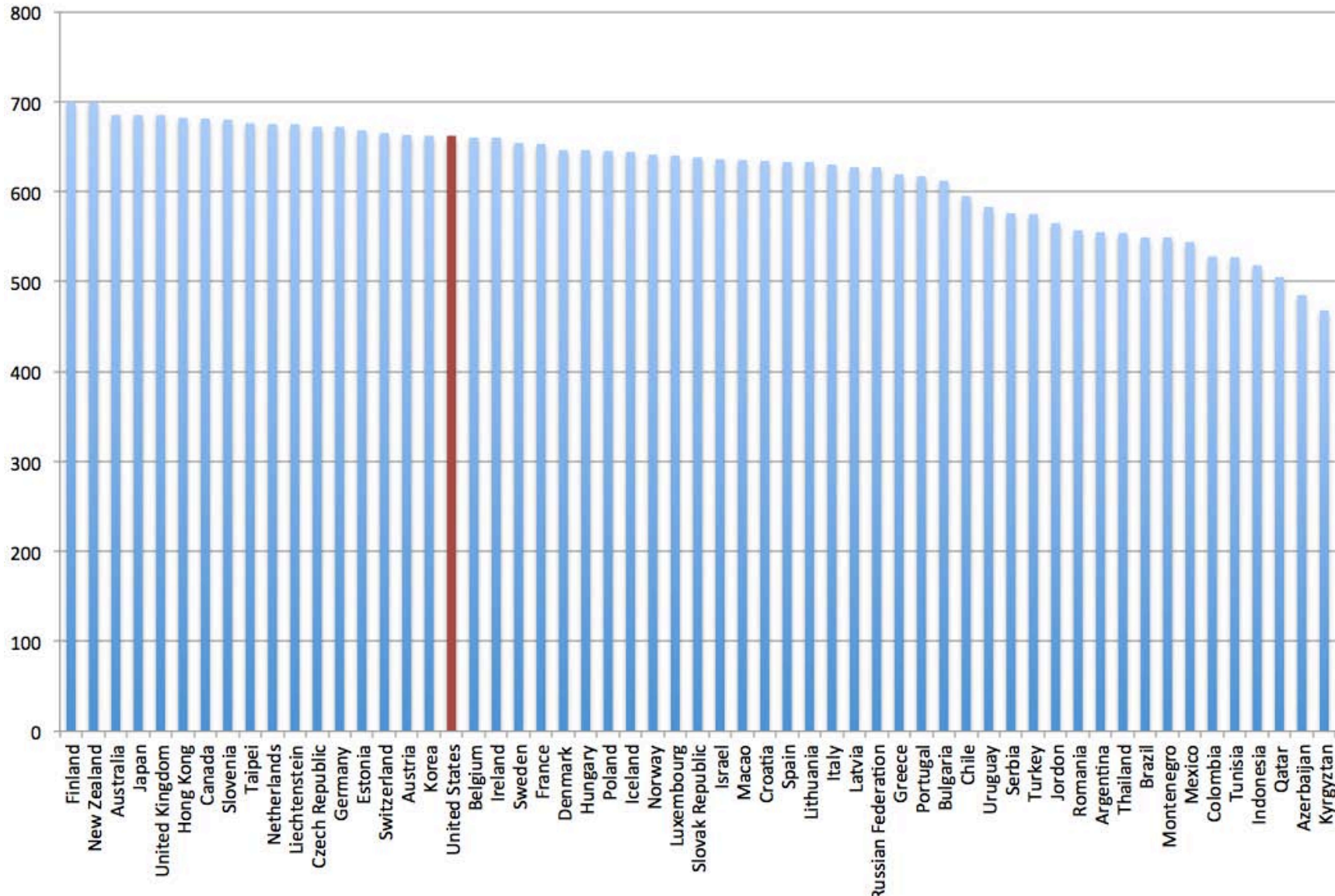
# PISA 2006 Science Study

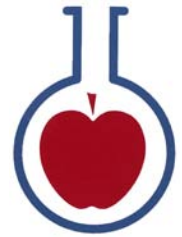


# What About Our Top Students?



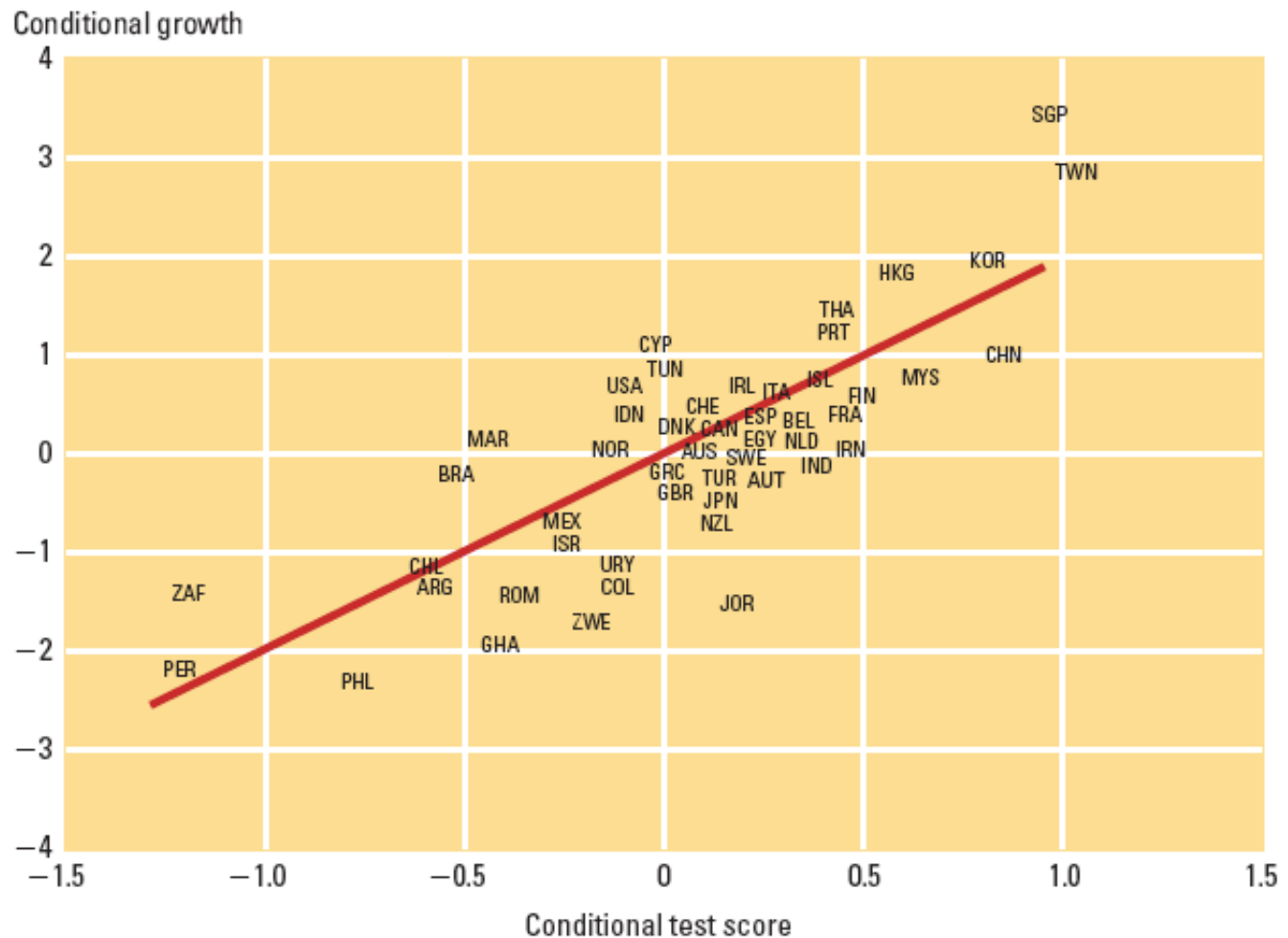
PISA Score (95th Percentile)





# Test Scores vs. Economic Growth

Annual Growth  
Rate (%) of  
GDP/ Capita



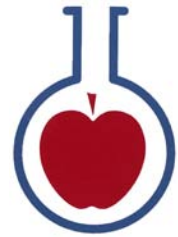
From: *Education Quality and Economic Growth*, E. Hanushek & L. Woessmann, World Bank, 2007



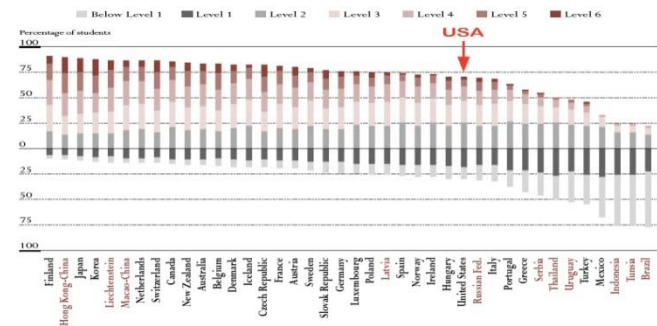
# Education Quality and Economic Growth

- What contributes to economic growth?
  - Rocket Scientists?  
(Very high skills for a few individuals)
  - Education for All?  
(Basic skills for most in a population)
- ***Both*** are important to economic growth!

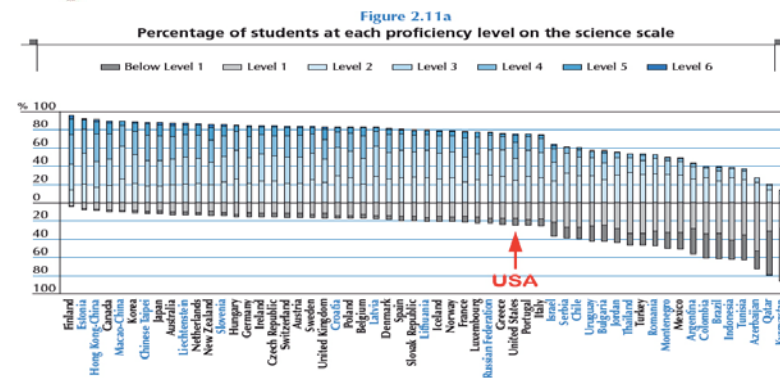
# Problems in Math, Science, and Problem Solving



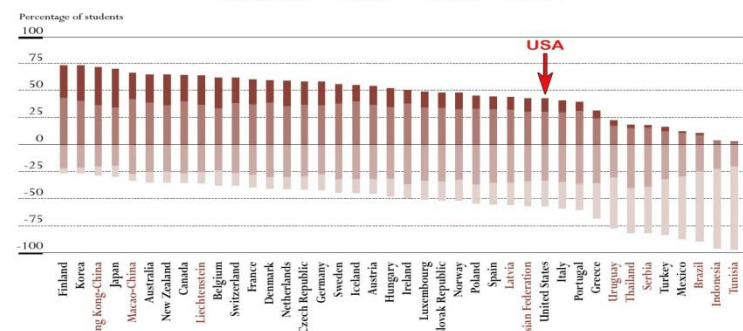
- PISA 2003 Math

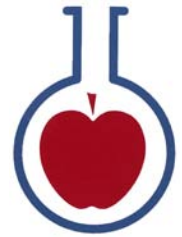


- PISA 2006 Science

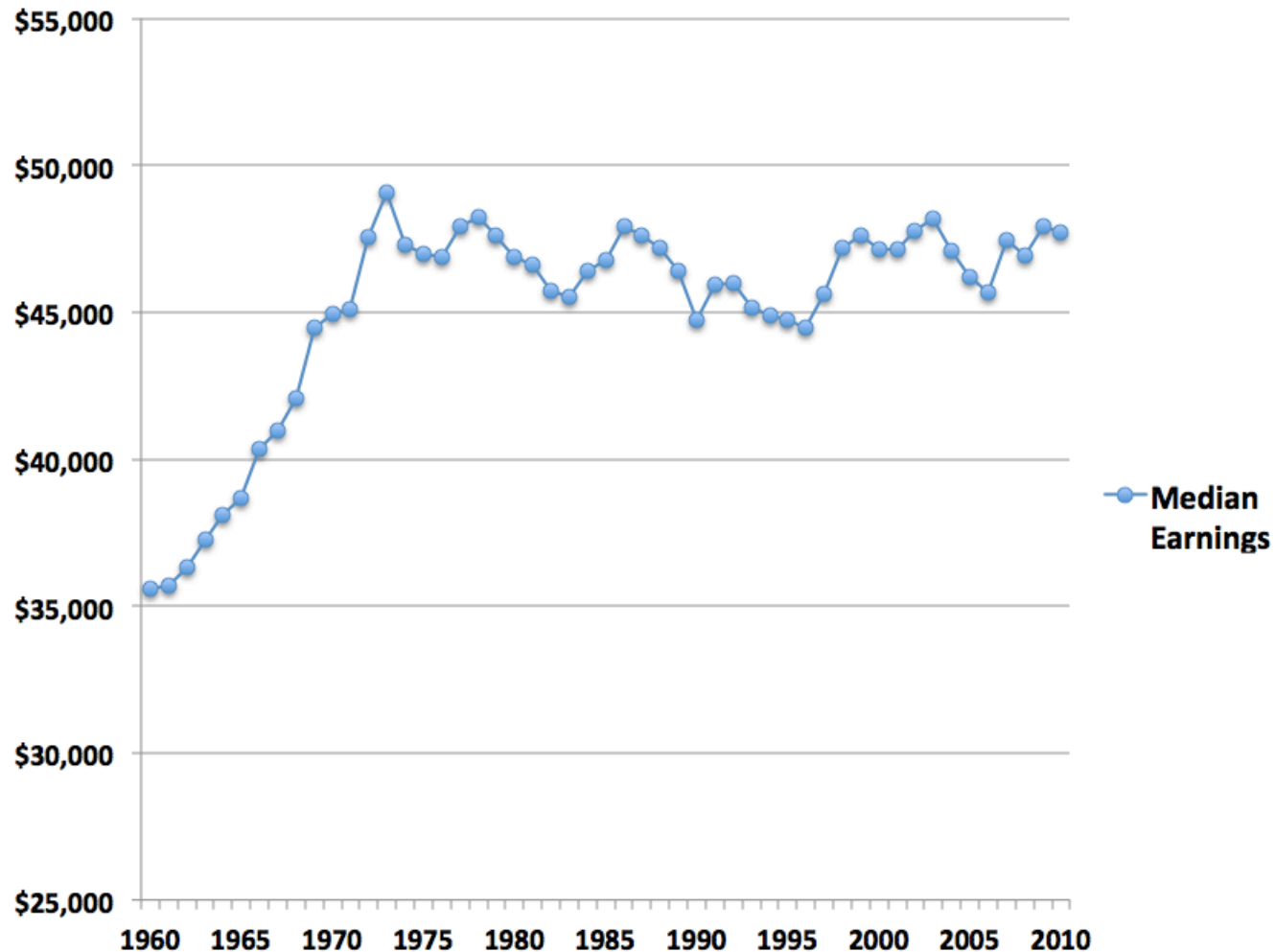


- PISA 2003 Problem Solving



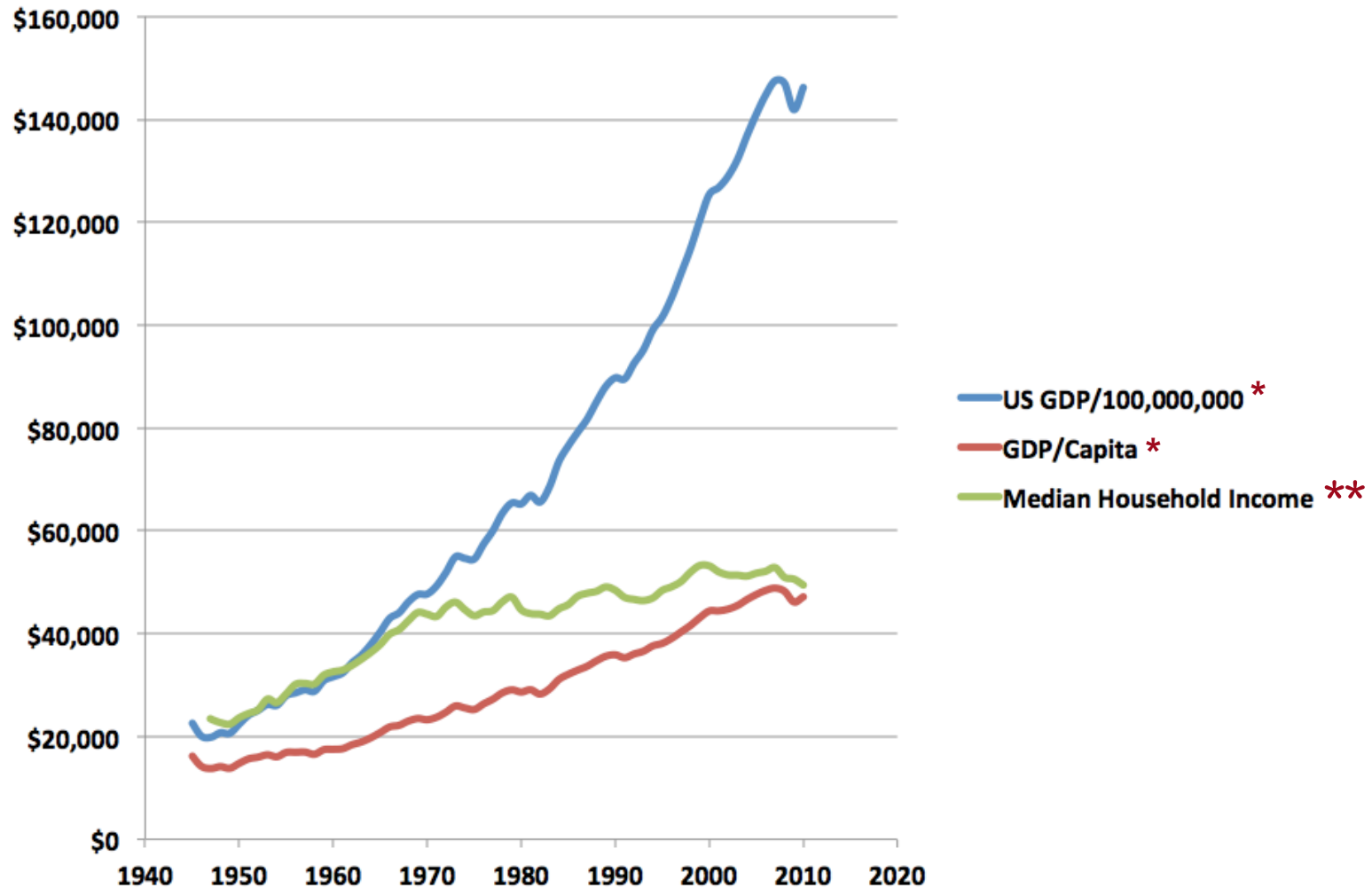
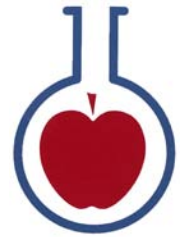


# Median Male Earnings





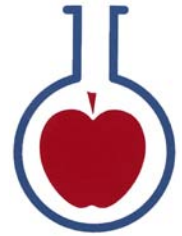
# GDP, GDP per Capita, and Median Household Income



\* <http://www.measuringworth.com>

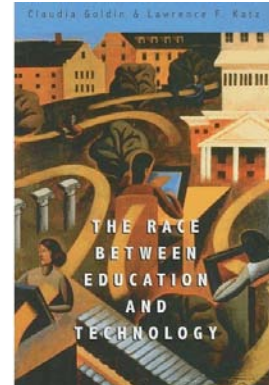
\*\* [www.census.gov/prod/2011pubs/p60-239.pdf](http://www.census.gov/prod/2011pubs/p60-239.pdf) (Table A-2)

(All dollars in CPI adjusted 2010



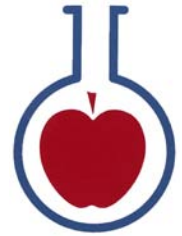
# STEM Education Concerns

- For over 120 years the U.S. led the world on many measures of education *attainment*.
  - % population with high school diploma (Now not in top 20 nations)
  - % population with college degree (Now not in top 10 nations)
  - Began falling behind in the 1970's
- U.S. scores from the middle to the bottom of industrialized world in international K-12 science, math, and problem solving tests (*Quality* problems and *attainment* problems)
- Negative consequences for U.S. economy, scientific enterprises, and middle class have already begun
- Education is a complicated systems problem—will take decades to fix the things that are suboptimal



# NIH Office of Science Education

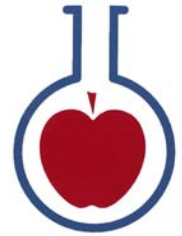
## *History*



- **Founded in 1991**
  - **As Office of Science Education Policy (OSEP)**
    - Increasing concern after *A Nation at Risk* report (1983)
    - OSEP monitors education issues for NIH director
  - **OSE represents NIH on Federal initiatives and committees**
    - PHS Life Science Education and Literacy Board (1990-1995)
    - FCCSET Committee on Education and Human Resources (Early 1990's)
    - NAS National Science Education Standards (1996)
    - National Education Research Policy and Priorities Board (1997-2002)
    - NAS Rising Above the Gathering Storm report (2005)
    - Asia Pacific Economic Cooperation science/ math education forum (2005)
    - Academic Competitiveness Council (2005-2007)
    - NSTC Subcommittee on Education (2008-2010)
    - NSTC Full Committee on STEM Education (2010-)
    - Dept. of Education exchanges with People's Republic of China (2008-)
    - NAS Framework for New Science Education Standards (2011)

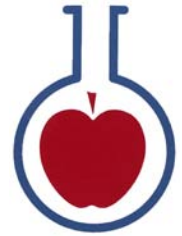
# NIH Office of Science Education

## *Mission Statement*



- OSE plans, develops, and coordinates a comprehensive science education program to strengthen and enhance efforts of the NIH to attract young people to biomedical and behavioral science careers and to improve science literacy in both adults and children:
  - Develops, supports, and directs new program initiatives at all levels with special emphasis on targeting students in grades kindergarten to 16, their educators and parents, and the general public;
  - Advises NIH leadership on science education issues;
  - Examines and evaluates research and emerging trends in science education and literacy for policy making;
  - Works closely with the NIH extramural, intramural, women's health, laboratory animal welfare, and minority program offices on science education issues and programs to ensure coordination of NIH efforts;
  - Works with NIH institutes, centers, and divisions to enhance communication of science education activities; and
  - Works cooperatively with other public- and private-sector organizations to develop and coordinate activities.

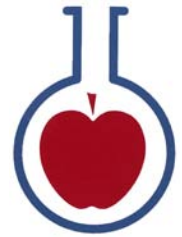
# NIH Office of Science Education



- **Budget ~\$4 million/year**
- **Eight federal employees**
- **Seven contractors (full and part time)**
- **Occasional rotations by AAAS fellows, Einstein fellows, Presidential management interns, etc.**
- **Currently one federal employee on 3-month detail**

# NIH Office of Science Education

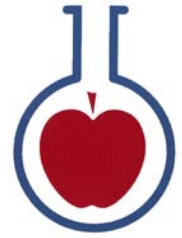
## *Sample Programs*



	<u>Programs</u>	<u>Collaborators</u>
•		
•	<b>National</b>	
	• NIH Curriculum Supplements Series	(ICs)
	• OSE Web Site	(ICs)
	• NIH Science Education Exhibit Booth	(ICs)
	• National Lab Network	(ICs)
	• <i>Women are...</i> video and poster series	(ORWH)
	• LifeWorks® Career Exploration	(ICs)
	• LifeWorks® E-mentoring	(ICs)
•	<b>Local</b>	
	• LifeWorks® Speakers Bureau	(ICs)
	• SciLife® Career Exploration	(ICs)
	• Science in the Cinema	(ICs)
	• NIH Scientists Volunteer for Education	(ICs)

# science.education.nih.gov

## A teacher portal to NIH resources



- ~2000 NIH resources
- Topics, grades, formats
- ~300,000 visitors/month
- ~2 Million pageviews/month
- Permits teacher feedback
- Automates ordering

Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)

National Institutes of Health

Search this site

FREE Resources for Science Teachers

[SciEd Twitter](#) [SciEd Blog](#)

### Featured Programs

**NEW Curricula!**

Evolution & Medicine  
Rare Diseases & Scientific Inquiry

NIH Curriculum supplements for K-12 science teachers

**DNA DAY**

DNA Day Essay Contest  
Entries Due March 12

Find us on Facebook  
NIHSciEd on Facebook

**LifeWorks® Careers**

Career exploration

**LifeWorks® E-mentoring**

Online e-mentoring program for high school and college students

Scientists Volunteer for Education  
NIH Scientists Volunteer for Education

### Educational Resources

**Topics**

- Animals in Research
- Bioethics
- Blood & Lymphatic System
- Bones, Joints, & Muscles
- Brain & Nervous System
- Cell Biology & Cancer
- Child & Teen Health
- Complementary and Alternative Medicine
- Digestive System
- Ears, Nose, & Throat
- Endocrine System
- Environmental Health & Toxicology
- **More...** (43 total)

**Scientists Volunteer for Education**

- NIH SciEd Nation
- NIH Science Education Volunteer Opportunities
- Scientists in Science Education Report

**Careers**

- Women Are Scientists
- Findings
- Changing the Face of Medicine (Exhibit)
- Wish-Net
- Genomic Careers Resource
- LifeWorks E-mentoring
- LifeWorks Career Exploration
- Student Internships and Opportunities
- Student Jobs

**Grade Levels**

- High School
- Middle School
- Elementary School

**Resource Formats**

- Lesson Plans and Supplemental Curricula
- Bookmarks
- Español (Spanish)
- Multimedia
- Newsletters
- Online Exhibits
- Online Resources
- Photos, Images, & Graphics
- Posters
- Print Materials
- Professional Development
- Public Outreach
- Slides & Presentations
- Supplemental Curricula
- Tutorials & Reviews

**DC Area Programs**

- LifeWorks Speakers Bureau
- Speakers
- Medicine For the Public
- Mini-Med School
- Request Science Fair Judges
- Science Fair Judges
- Scientists as Educators
- SciLife
- **More...** (13 total)

### NIH News

**Rare Immune Disease**  
Gene causes allergic disorder triggered by cold temperatures.  
Posted on January 26, 2012

**NIH Statement on H5N1**  
Certain studies paused pending international dialogue.  
Posted on January 20, 2012

**DASH Eating Plan**  
Dietary approaches to stop hypertension  
Posted on January 19, 2012

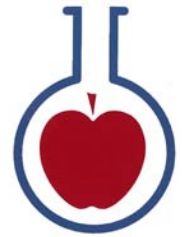
For the Press | Newsletters & Feeds

**FLU.GOV**  
Know what to do about the flu.  
VISIT FLU.GOV  
SHARE THIS WIDGET



# LifeWorks®

<http://science.education.nih.gov/LifeWorks>

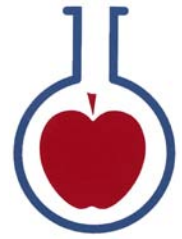


- Career exploration Web site
- For MS & HS students
- 200+ careers profiled
- Education required, salary
- Interviews, videos
- ~100,000 visitors/ month

The screenshot shows the LifeWorks website with a header for the National Institutes of Health Office of Science Education. The main content area is divided into several sections:

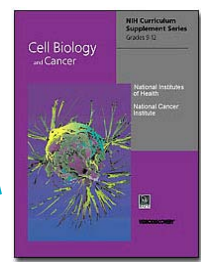
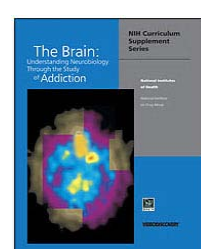
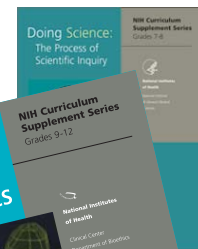
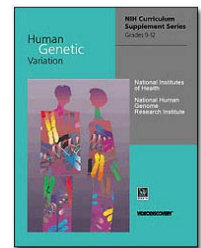
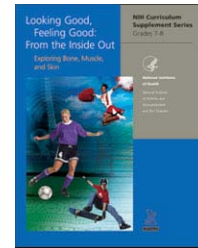
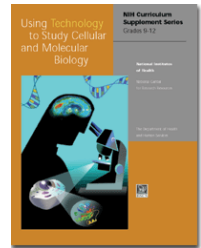
- Explore Careers**: Includes a "Try our Career Finder" button and a link to browse 100+ career descriptions by alphabetical list, interest area, education required, or median salary.
- Education Makes a Difference**: Features a bar chart comparing earnings by education level. The chart shows that higher education levels generally lead to higher median weekly earnings. The source is cited as the Bureau of Labor Statistics.
- Check Out a Success Story**: Profiles Kedar Narayan, an immunologist at NIH, with a video interview link.
- Activities**: Provides information about the American Medical Association's definition of an immunologist and lists examples of conditions they treat.
- Minimum Education Required**: States that a Master's Degree (M.D.) is required for an immunologist.
- College & Career Planning Time-Line**: Offers guidance on what to do each year of high school to improve chances of getting into college.
- Overview**: Includes links for introduction, preparing for college early, and planning a career.
- More Interviews**: Lists interviews with various professionals like a dentist, pharmacist, biomedical engineer, biologist, nurse, registered therapist, recreational therapist, and ophthalmologist.

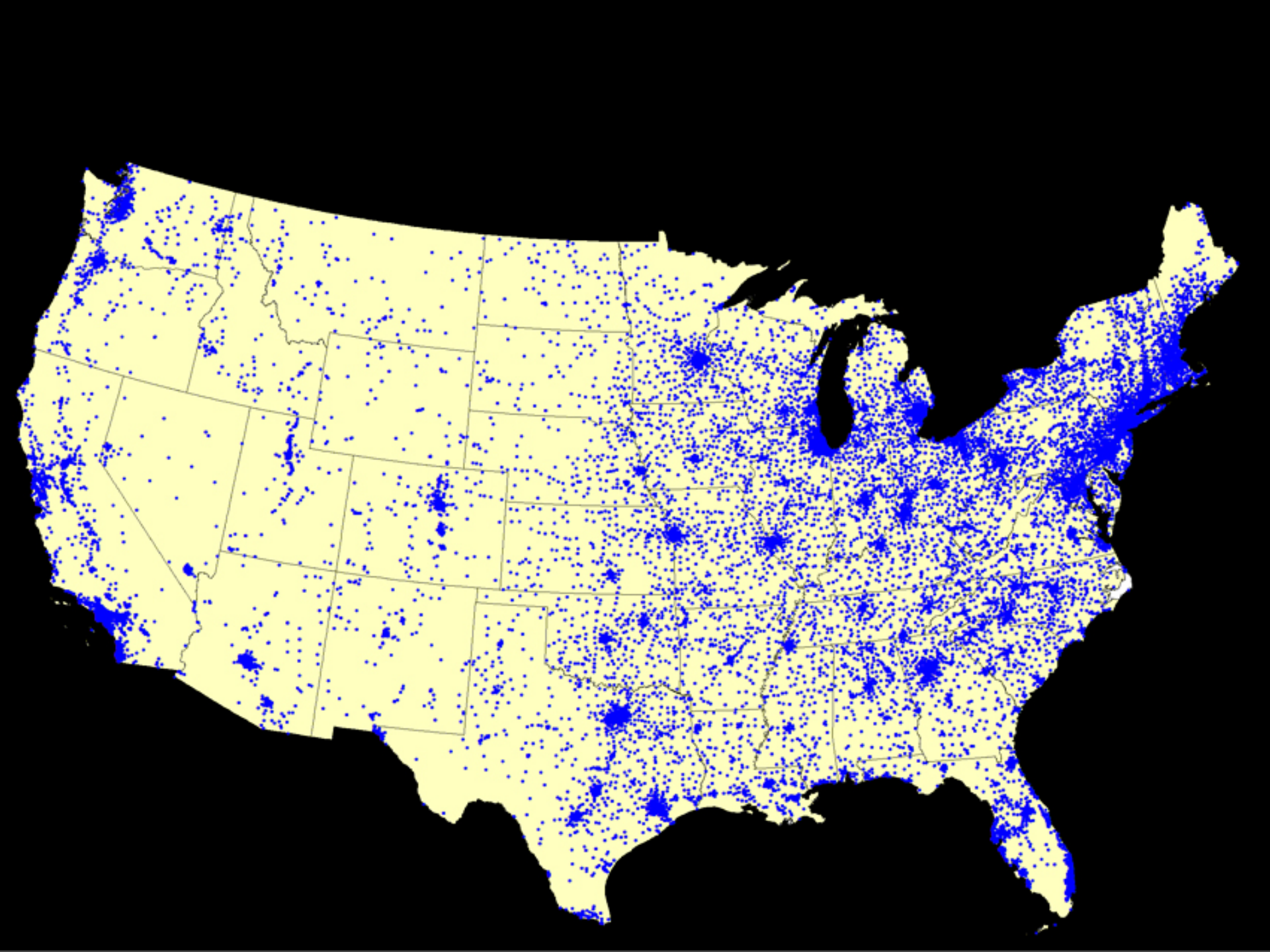




# NIH Curriculum Supplements Series

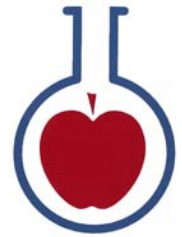
- OSE's premier product- targets grades K-12
- Aligned to state education standards
- Brings NIH research to teachers—free!
- Created with outside curriculum development experts (e.g., BSCS, EDC)
- Interactive teaching units that combine cutting-edge science from the NIH with innovative pedagogy— 19 titles to date
- Over 400,000 supplements requested by 90,000+ educators in more than 16,700 zip codes





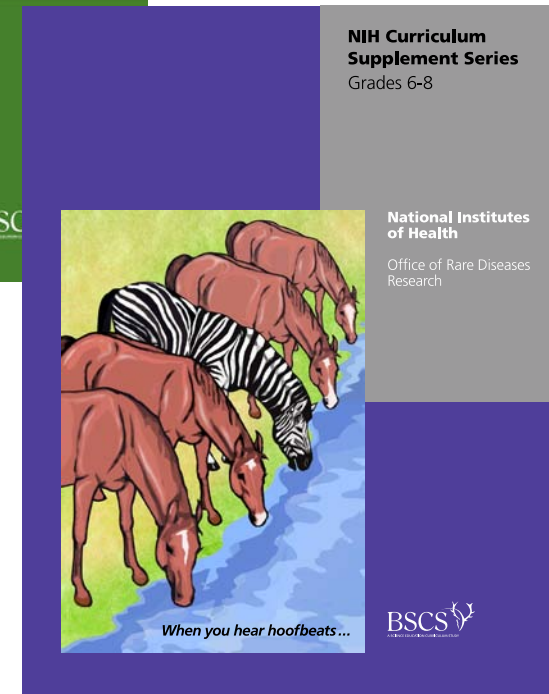
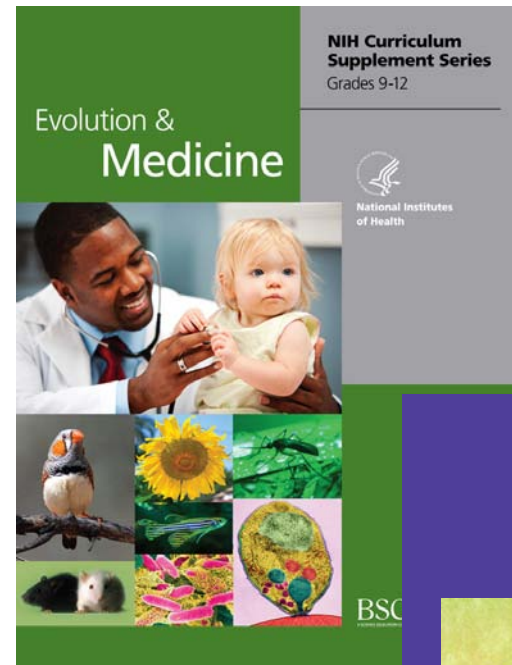






# New Supplements- Spring 2012

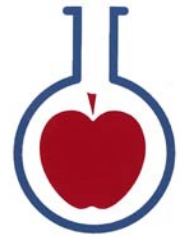
- **Evolution and Medicine**
  - **Grades 9-12**
- **Rare Diseases and Scientific Inquiry**
  - **Grades 6-8**



# NIH K-12 LAB Challenge

## Dr. Collins' strawberry DNA precipitation





# NIH K-12 LAB Challenge

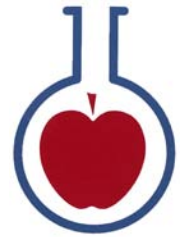
- After hearing about strawberry DNA experiment, Secretary Duncan challenged NIH to come up with 100 such ideas for teachers to use
- Soliciting ideas through Challenge.gov—winning ideas published



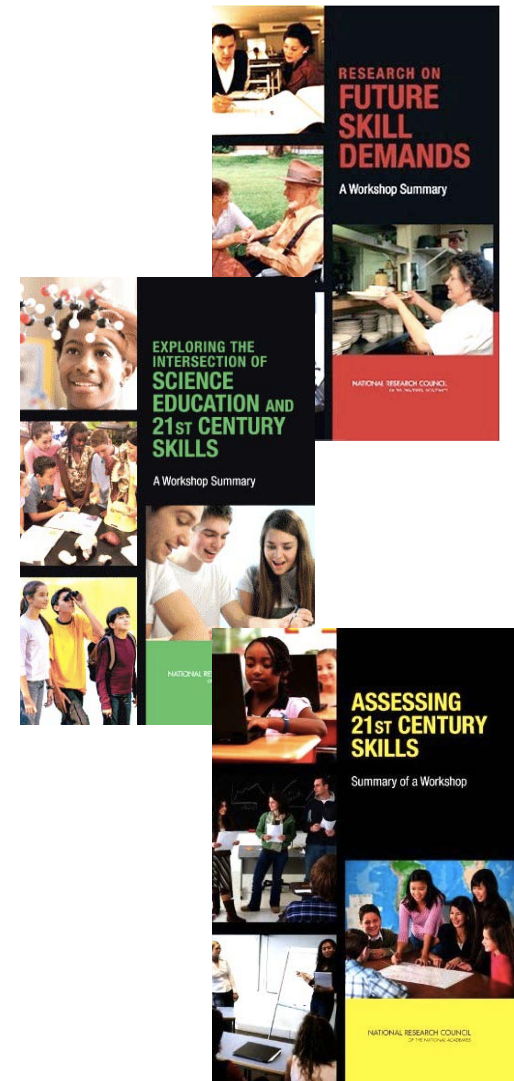


# NIH Office of Science Education

## Sponsored NAS Workshops on Workforce Skills

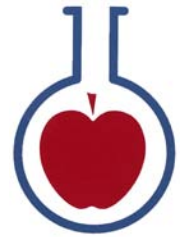


- **Future Skill Demands (2007)**
  - Labor economists
  - High skill/ low skill jobs
  - Skills needed for a middle class wage
- **Science Education and Skills (2009)**
  - Science Educators
  - Teaching 21<sup>st</sup> Century Skills in science classes
- **Assessing 21<sup>st</sup> Century Skills (2011)**
  - Business already uses such assessments
  - Inexpensive school based assessments will be challenging



# NIH Office of Science Education

## Science Education Resources Group (SERG)

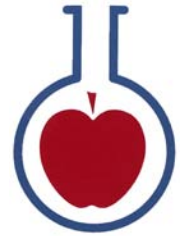


- Quarterly meetings of IC's and offices with science education programs or interest
  - Goal is to connect these programs to Federal and national education priorities...and to each other
- 
- |         |       |       |       |
|---------|-------|-------|-------|
| • NHLBI | NIAID | NEI   | NIDDK |
| • NIDA  | CSR   | NIBIB | NCI   |
| • NIGMS | NIMH  | NICHD | NIA   |
| • NIMHD | NHGRI | NCCAM | NINDS |
| • NIAAA | NLM   | NIEHS | NIDCD |



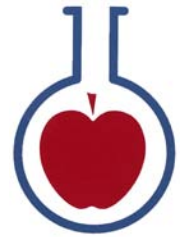
# NIH Office of Science Education

## Planned Activities



- **NSTC Committee on STEM Education**
  - **Five-year *Strategic Plan for Federal STEM Education***
  - **Will help relevant NIH programs align to Strategic Plan goals**
- **Align all NIH educational materials to *Common-Core State Science Standards* created by National Governors Association**
  - **47 states have adopted English language arts and mathematics**
  - **Fewer states will adopt science standards (evolution) but still a giant step forward (Due late 2012 or early 2013)**

# Presidential Math & Science Teaching Awards (1/6/2010)



- “And just because you aren't a teacher that doesn't mean you can't help educate our young people.... *I'm calling on all 200,000 scientists who work for the federal government to do their part in their communities: to speak at schools, to create hands-on learning opportunities through efforts like National Lab Day, and to help stoke that same curiosity in students which perhaps led them to pursue a career in science in the first place.*”  
-President Obama



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**Office of Science Education**  
**Division of Program Coordination,**  
**Planning and Strategic Initiatives**  
**National Institutes of Health, DHHS**

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