Recruitment: A Critical Element in Addressing the National Shortage of Physics Teachers

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Calls to Action

• Rising Above the Gathering Storm:

**Action A-1:** Annually recruit 10,000 science and mathematics teachers by awarding 4-year scholarships and thereby educating 10 million minds.

**Action C-1:** Increase the number and proportion of US citizens who earn physical-sciences, life-sciences, engineering, and mathematics bachelor’s degrees by providing 25,000 new 4-year competitive undergraduate scholarships each year to US citizens attending US institutions.
"10,000 Teachers, 10 Million Minds" Science and Math Scholarship Act

H.R. 362

Bill Summary and Status

Introduced in the House January 10, 2007

Bill Summary

The bill implements most of the K-12 science education recommendations of the National Academy of Sciences (NAS) report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. It establishes a teacher education program at the National Science Foundation (NSF) to encourage math, science and engineering faculty to work with education faculty to improve the education of science and math teachers and to provide scholarships to science, math and engineering students who commit to become science or math teachers at elementary and secondary schools; authorizes summer teacher training institutes at NSF and DOE to improve the content knowledge and pedagogical skills of in-service science and math teachers, including preparing them to teach Advanced Placement and International Baccalaureate courses in science and math; requires that NSF include support for master's degree programs for in-service science and mathematics teachers within the NSF Math and Science Partnerships; and authorizes funding for the NSF STEM Talent Expansion program and expands the program to include centers for improving undergraduate STEM education.
America COMPETES Act of 2007

• Double funding for the National Science Foundation to $11.2 billion by 2011

• Expand the Robert Noyce Teacher Scholarship Program

• Develop and implement programs for bachelor’s degrees in math, science, and engineering with concurrent teaching credentials and part-time master’s in education programs for math, and science teachers to enhance both content knowledge and teaching skills.

• Facilitate expansion of Advanced Placement (AP) and International Baccalaureate (IB) programs by increasing the number of teachers prepared to teach AP/IB and pre-AP/IB math, and science in high need schools
Teacher Shortages

U.S. Department of Education estimates that an additional **2.2 million teachers** will be needed over the next decade, exceeding the annual production rate of new teachers.

More specifically, “hard-to-staff” schools in **high-poverty urban and rural districts** will require more than **700,000 new teachers** in the next 10 years.

Many states also have identified specific subject-area shortages that exist across their schools in topics such as **math and science**.

Education Commission of the States
Need for High School Physics Teachers

Relative Demand by Field

Fields with Considerable Shortage (5.00 - 4.21)

<table>
<thead>
<tr>
<th>Field</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional/Behavior Disorders</td>
<td>4.42</td>
</tr>
<tr>
<td>Severe/Profound Disabilities</td>
<td>4.35</td>
</tr>
<tr>
<td>Mathematics Education</td>
<td>4.28</td>
</tr>
<tr>
<td>Physics</td>
<td>4.26</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td>4.26</td>
</tr>
<tr>
<td>Mild/Moderate Disabilities</td>
<td>4.23</td>
</tr>
<tr>
<td>Learning Disability</td>
<td>4.21</td>
</tr>
</tbody>
</table>

Fields with Some Shortage (4.20 - 3.41)

<table>
<thead>
<tr>
<th>Field</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>4.20</td>
</tr>
<tr>
<td>Multicategorical</td>
<td>4.20</td>
</tr>
<tr>
<td>Visually Impaired</td>
<td>4.19</td>
</tr>
<tr>
<td>Hearing Impaired</td>
<td>4.17</td>
</tr>
<tr>
<td>Bilingual Education</td>
<td>4.10</td>
</tr>
<tr>
<td>Technology Education</td>
<td>4.02</td>
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www.PTEC.org www.PhysTEC.org
Recruitment Strategies 101

• Identify contact person inside physics department knowledgeable about teaching certification/preparation
• Published degree track for HS teaching in physics department
• Identify and track students interested in HS teaching
• Invite HS teachers to speak in physics department
• Raise scholarship funds (e.g. Noyce) to assist prospective teachers
National Task Force on Undergraduate Physics

• Joint AAPT/APS/AIP task force

• SPIN-UP Report 2003:

Strategic Programs for Innovation in Undergraduate Physics

www.aapt.org/Projects/ntfup.cfm

AIP Statistical Research Center, Enrollments and Degrees Report and * NCES Digest of Education Statistics

Natural Sciences, Math & Engineering Bachelor's*

Physics Bachelor's

~65% Increase

2% of STEM 0.4% of all
Recruitment Strategies 501

Surprise Attack:
Give students an authentic teaching experience

Two examples:
• Learning Assistants
• UTeach: STEP-I, STEP-II
Coalition Activities

- Now 72 PTEC Institutions
- National Conference on Physics and Physical Science Teacher Education:
  - **3-4 Mar 2007** Theme: Recruitment (Boulder, CO)
  - **22-23 Feb 2008** Theme: Master Teachers (Austin, TX)

- Physics Teacher Education Digital Library [www.PTEC.org](http://www.PTEC.org)
- Best-practice book to bring together information on Physics Teacher Education, Editor: *David Meltzer*
Coalition Activities