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Philadelphia Math & Science Coalition

Strategic Plan

July 2006

With generous support from:

GlaxoSmithKline
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Ford Motor Company
The Boeing Company

Philadelphia Education Fund
7 Benjamin Franklin Parkway, Suite 700
Philadelphia, PA 19103
215-665-1400
www.philaedfund.org

Executive Summary

THE PHILADELPHIA EDUCATION FUND CONVENED THE PHILADELPHIA MATH & SCIENCE COALITION IN 2005,

as a partnership among businesses, universities, schools and cultural organizations. The Coalition's mission is to continuously enhance the quality of mathematics and science teaching in the Philadelphia public schools, so that our youth will excel in both subjects. The Coalition partners are committed to efforts that are both integrated and long term.

The Coalition's vision is that Philadelphia public school students will graduate from high school positioned to succeed in post-secondary education and to compete successfully in an increasingly global workforce that requires 21st century math and science knowledge and problem solving skills. In order to accomplish this, the Coalition will focus initially on math and science teachers.

The Coalition's seven goals for Philadelphia public schools are:

1. Attract university students who are talented and interested in math and science, and recruit them to programs preparing them for math and science secondary-level (grades 6 - 12) teaching, so that they will teach in Philadelphia after graduation.
2. Attract industry STEM (Science, Technology, Engineering, Math) professionals to math and science teaching positions and prepare these professionals for positions in Philadelphia.
3. Enhance current teacher pre-service programs and, as needed, create new programs designed to prepare future math and science teachers to teach in Philadelphia, in particular on the secondary level.
4. Provide in-service professional development to current secondary-level math and science teachers.
5. Design retention strategies and create vehicles that help to keep effective math and science teachers in Philadelphia for at least five years.
6. Influence local, state and national policies that can improve math and science instruction .
7. Communicate with the public continuously and in a compelling manner the need for children to excel in math and science and the need to attract, prepare and retain effective math and science teachers.

The Coalition will identify and recognize effective practices that address its goals, coordinate and align current efforts, identify gaps and collaborate to fill these gaps. The Coalition will collaborate with other alliances and professional organizations regionally, statewide and nationally, as appropriate, to fulfill its mission and goals.

Vision & Mission

Vision:

Philadelphia public school students will graduate from high school positioned to succeed in post-secondary education and to compete successfully in an increasingly global workforce that requires 21st century math and science knowledge and problem solving skills. Philadelphia public school graduates will be well informed citizens able to make responsible decisions in their personal and public lives regarding issues of personal finance, health, the environment, the economy and related local, national and international policy issues that they will encounter throughout their lives.



Mission:

The Philadelphia Math & Science Coalition is conceived as a partnership among universities, schools, corporations and cultural organizations. The Coalition's mission is to continuously enhance the quality of math and science teaching in the Philadelphia public schools, so that our youth will excel in math and science. The Coalition partners recognize that in order to be successful, they must be committed to efforts that are both integrated and long term.

Operating Principles:

1. The Coalition will identify and recognize effective practices that address its goals, coordinate and align current efforts, identify gaps and collaborate to fill these gaps. It will facilitate collaboration that will add value to efforts of the partners to achieve Coalition goals.
2. The Coalition will engage teachers and university faculty to inform and implement its Strategic Plan.
3. The Coalition will collaborate with other alliances and professional organizations regionally, statewide and nationally as appropriate to fulfill the Coalition's mission and goals.
4. The Coalition will be inclusive, inviting businesses, universities and cultural organizations that subscribe to the Coalition vision, mission and goals to become partners.
5. The Coalition will seek to sustain its partnership and activities on a long-term basis.
6. The Coalition will engage in ongoing measurement and evaluation of its goals and their implementation, in order to assess its progress and to align the partners' efforts with local, regional and national needs.

ATTRACT TO THE UNIVERSITY, STUDENTS WHO ARE TALENTED AND INTERESTED IN MATH AND SCIENCE AND RECRUIT THEM TO PROGRAMS PREPARING THEM FOR MATH AND SCIENCE SECONDARY LEVEL (GRADES 6 - 12) TEACHING, SO THAT THEY WILL TEACH IN THE PHILADELPHIA PUBLIC SCHOOLS AFTER GRADUATION.

Benchmarks:

Coalition partners will provide evidence that they have strengthened current programs and, as needed, created new innovative undergraduate or graduate university programs to attract math and science majors to become teachers in the Philadelphia public schools. These programs will present teaching as an attractive and desirable profession, while expanding and deepening students' interest in math and science.

Year one: Map current efforts among Coalition partners to attract math and science university majors to study math and science secondary-level teaching; identify appropriate changes in current programs; and begin to draft new, innovative programs to meet needs. Identify potential funding sources.

Year two: Seek funding and begin implementing programs based on needs assessment of year one.

Year three: Implement programs and continue to seek funding. Increase the number of students majoring in math and science secondary-level teaching. Recommended increase is 25% of year one's baseline number.

"The state of US K-12 education in science, mathematics and technology has become a focus of intense concern. With the economies and broader cultures of the United States and other countries becoming increasingly dependent on science and technology, US schools do not seem capable of producing enough students with the knowledge and skills needed to prosper."

("Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future," The National Academies, 2005)

ATTRACT INDUSTRY STEM PROFESSIONALS TO MATH AND SCIENCE TEACHING POSITIONS IN THE PHILADELPHIA PUBLIC SCHOOLS AND PREPARE THESE PROFESSIONALS FOR POSITIONS IN THE SCHOOLS.

Benchmarks:

Partners will demonstrate that they have collaborated on a campaign to attract and prepare STEM professionals from industry to math and science teaching positions in the Philadelphia public schools. These programs will enable professionals to preserve their identities as scientists, mathematicians and engineers, and to use their skills as educators. Current educators will be integral in the preparation of STEM professionals for teaching positions.



Year one: Map current efforts among Coalition partners, identify opportunities and potential funding sources, and draft programs to take advantage of these opportunities.

Year two: Seek funding for, and begin implementation of, programs.

Year three: Implement programs and continue to identify funding. Increase the number of STEM professionals entering math and science secondary-level teaching. Recommended increase is 25% of year one's baseline number.

ENHANCE CURRENT TEACHER PRE-SERVICE PROGRAMS AND, AS NEEDED, CREATE NEW PROGRAMS DESIGNED TO PREPARE FUTURE MATH AND SCIENCE TEACHERS TO TEACH IN THE PHILADELPHIA PUBLIC SCHOOLS, IN PARTICULAR ON THE SECONDARY LEVEL. THESE PROGRAMS WILL PREPARE TEACHERS WHO ADDRESS DIVERSE LEARNERS' NEEDS, AND WHO FOSTER IN STUDENTS DEEP, USABLE KNOWLEDGE OF MATHEMATICS AND SCIENCE.

Deep, usable knowledge of mathematics and science includes:

- Having fluent and flexible mastery of facts, procedures and ideas; their underlying principles; and connections among them.
- Being able to apply knowledge to problems and situations.
- Having the inclination to generate questions and make conjectures or hypotheses about new relationships.

Benchmarks:

Coalition partners will demonstrate that they have strengthened math and science teacher pre-service programs.

Year one: Identify the main components of effective practices in the preparation of math and science teachers, review examples of effective practices, assess current pre-service programs and identify appropriate changes in these programs.

Year two: Engage teacher education programs—both content and pedagogy experts—in creating changes in teacher preparation programs at partner universities. Begin introducing changes.

Year three: Continue introducing changes at partner universities and encourage other universities that prepare math and science teachers for the Philadelphia public schools to introduce appropriate changes. Coalition partners will provide evidence of changes that address the main components of effective practices in math and science teacher preparation.

PROVIDE IN-SERVICE PROFESSIONAL DEVELOPMENT TO CURRENT SECONDARY LEVEL MATH AND SCIENCE TEACHERS IN THE PHILADELPHIA PUBLIC SCHOOLS SO THAT TEACHERS CONTINUE TO ADDRESS DIVERSE LEARNERS' NEEDS, AND TO FOSTER IN STUDENTS DEEP, USABLE KNOWLEDGE OF MATHEMATICS AND SCIENCE, AS OUTLINED IN GOAL # 3.

Benchmarks:

Coalition partners will demonstrate that they have enhanced current in-service professional development programs and, as appropriate, developed new programs. Partners will consider job-embedded professional development conducted in conjunction with universities and corporations.

Year one: Identify the main components of effective practices in the professional development of math and science teachers, review examples of effective practices, assess current in-service programs and identify appropriate changes for these programs. Align programs with the needs and requirements of the School District.

Year two: Begin introducing identified changes in current in-service professional development programs. Design new in-service programs, as appropriate, and seek funding for these programs.

Year three: Implement revised in-service professional development programs and new programs, while continuing to identify funding for programs. Coalition partners will provide evidence of changes that address the main components of effective practices in the professional development of math and science teachers.



DESIGN STRATEGIES AND CREATE VEHICLES THAT HELP RETAIN EFFECTIVE MATH AND SCIENCE TEACHERS IN THE PHILADELPHIA PUBLIC SCHOOLS FOR AT LEAST FIVE YEARS.

Benchmarks:

Coalition partners will demonstrate that they have designed strategies and identified vehicles to retain effective math and science teachers. This includes helping teachers to maintain their identity as mathematicians and scientists, improving teaching resources and creating a system of rewards, while supporting School District mentoring and induction efforts. Coalition partners will identify other strategies to retain effective math and science teachers.

Year one: Coalition partners will identify the factors causing effective math and science teachers to leave teaching in the Philadelphia schools; identify factors associated with job satisfaction by Philadelphia math and science teachers; design programs aimed at retaining effective math and science teachers and seek funding for these programs.

Year two: Continue to seek funding for programs aimed at retaining effective math and science teachers and begin to implement them.

Year three: Scale up implementation of programs and continue to identify funding. Monitor and modify new efforts as needed. Increase retention rate of effective math and science teachers. Recommended increase is 10% of year one's baseline number.

"Although America has not wavered from its understanding of the power and potential of mathematics and science, it has failed to comprehend that in the highly competitive, global economy of the 21st century, mathematics and science are no longer pursuits for the few. They are requirements for all."

*("A Commitment to America's Future: Responding to the Crisis in Mathematics and Science Education,"
Business-Higher Education Forum, 2005)*

INFLUENCE LOCAL, STATE AND NATIONAL POLICIES THAT CAN IMPROVE MATH AND SCIENCE INSTRUCTION IN PHILADELPHIA PUBLIC SCHOOLS. THIS GOAL AND GOAL #7 WILL ENTAIL COLLABORATING WITH OTHER ORGANIZATIONS ACROSS THE STATE TO ELEVATE THE IMPORTANCE OF MATH AND SCIENCE TO ALL COMMUNITIES IN THE COMMONWEALTH. BUSINESS LEADERS, EDUCATORS AND LEGISLATORS WILL NEED TO WORK TOGETHER TO ACHIEVE THIS GOAL.

Benchmarks:

Coalition partners will demonstrate that they have identified policies that significantly affect math and science teaching, and that they have made progress toward changing these policies.

"...The future well-being of our nation and people depends not just on how well we educate our children generally, but on how well we educate them in mathematics and science specifically."

*("Before It's Too Late: A Report to the Nation from The National Commission on Mathematics and Science Teaching for the 21st Century,"
Commission Chair, John Glenn, 2000)*

Year one: Identify current policies that have a significant effect on math and science teaching, and identify additional policies that have the potential to positively affect math and science teaching. Identify desirable policy changes and new policies.

Year two: Continue to identify desirable policy changes and new policies, and begin a discourse with the appropriate officials to initiate change. Regarding state and national policies, the Coalition will collaborate with other organizations across the state and the nation, as appropriate, to advocate for change.

Year three: Continue to identify desirable policy changes and new policies, and communicate with the appropriate officials to initiate change. Regarding state and national policies, the Coalition will collaborate with other organizations across the state and the nation, as appropriate, to advocate for change. Coalition partners will provide evidence of progress toward policy changes that affect math and science teaching.

ARTICULATE TO THE PUBLIC CONTINUOUSLY AND IN A COMPELLING MANNER THE NEED FOR CHILDREN TO EXCEL IN MATH AND SCIENCE AND THE NEED TO ATTRACT, PREPARE AND RETAIN EFFECTIVE MATH AND SCIENCE TEACHERS. THIS INCLUDES COMMUNICATIONS THAT ELEVATE THE TEACHING PROFESSION TO A POSITION OF GREATER RESPECT.

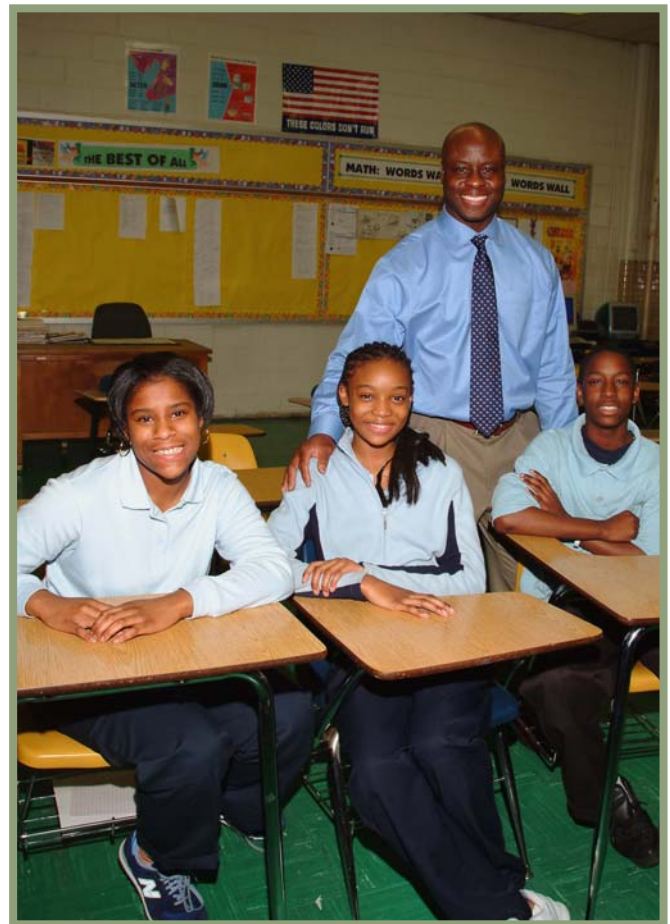
Benchmarks:

Coalition partners will demonstrate that they have articulated to the public the need for children to excel in math and science and, in that context, the need to nurture effective math and science teachers.

Year one: Identify and map current initiatives to communicate to the public the importance of children excelling in math and science and, in particular, the importance of effective math and science teachers.

Year two: Communicate to the public the importance of math and science in school instruction, in particular the importance of math and science teachers, via websites, public statements and the media.

Year three: Begin implementing communications campaign in Philadelphia. Collaborate with other regional and state organizations to extend the campaign. Coalition partners will provide evidence of progress toward a better public understanding of the importance of math and science, in particular, the importance of effective math and science teachers.



*THE PHILADELPHIA MATH & SCIENCE COALITION IS CONVENED BY
THE PHILADELPHIA EDUCATION FUND.*



THE PHILADELPHIA EDUCATION FUND is an independent non-profit organization dedicated to improving the quality of public education for under-served youth throughout the Philadelphia region. For 21 years, the Ed Fund has been working in partnership with school districts, universities, non-profit organizations and businesses to initiate and implement innovative educational programs, improve teacher quality, engage the community in school reform and conduct research. The Ed Fund is one of the largest of 86 education funds affiliated with the national Public Education Network. The Ed Fund's current initiatives include: Philadelphia Math & Science Coalition, Middle Grades Matter, Student Teacher Pipeline to the Future, College Access Program, Philadelphia Scholars, Education First Compact, Small Schools Initiative, Community Learning Briefs, along with research studies such as the Philadelphia Educational Longitudinal Study. Visit www.philaedfund.org.

Contact

Carol S. Fixman
Executive Director
Philadelphia Education Fund
Seven Benjamin Franklin Parkway, Suite 700
Philadelphia, PA 19103
(215) 665-1400 x3307

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