Milestones
Annual Report: September 1, 2012 – August 31, 2013
Promoting the Learning of Advanced Mathematics in Urban Schools
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MathPOWER's Mission is to Transform

the lives of urban youth by developing proficiency in mathematics and personal resiliency.

Get Involved

Math Puzzles

Math Games
We offer a number of trainings designed to help youth workers from varied programmatic settings increase their impact, by giving them the tools they need to teach math well. Click to learn more and to register for a Math Games workshop.

Teachers
Through teaching workshops and in-class coaching we help develop Boston Public School’s teachers by deepening their skill set and readying them for the nuances of teaching mathematics.

Afterschool
Our afterschool programs at Dearborn Middle School, the Yawkey Boys and Girls Club of Roxbury, and the Boys and Girls Club of South Boston provide students with a community and tutor-mentors that foster their math talent and personal resiliency.

Summer
Over 200 students come together each summer to experience our 5-week Algebra Plus Summer Academy. This rapidly growing program has expanded by over 150% since 2007.
Letter from the Executive Director

Featured on the adjacent page is an image from our new Web presence. With the assistance of members of Social Venture Partners, we are very pleased to welcome you to our new look. Our revamped Web page coincides with other changes resulting from our strategic initiatives. Our Board, Staff, and Volunteers have focused this year on expanding our senior-level staff to assist with increasing our efforts in fund development, marketing and communication, and to establish a broader external presence.

The heading on our new web page captures our essence: MathPOWER’s Mission is to transform the lives of urban youth by developing proficiency in advanced mathematics and personal resiliency. POWER is a significant word in the title of our organization. Being proficient in advanced mathematics equates to a powerful advantage into today’s world. Recent national studies have demonstrated that one of the best predictors of who will pursue and complete a college education is competency in advanced mathematics.

The term “advanced mathematics” assumes competency in Algebra II with at least one year of mathematics beyond Algebra II in high school. Helping students develop proficiency in mathematics is a goal that society can more easily address than the other correlates related to successful completion of a post-secondary education; e.g., parents’ highest level of education, socio-economic standing, etc.

While recent articles in The New York Times and other publications have praised Massachusetts for its students’ math achievement scores, a closer look at the results reveals that those achieving do not include equal representation of minority students in our urban schools. Our organization strives to enhance the opportunities for students in urban settings to be more fully represented among students who demonstrate competency in advanced mathematics. To achieve our mission, we provide direct services to students and teachers within urban school districts. Through financial assistance from individuals and foundations along with our volunteers, we are making it possible for students in urban schools to experience the true POWER of education! Through all of our programs, especially our work with students in our Summer Academy and our Math*STARS afterschool programs, we see the direct benefits of providing students with effective interventions.

Spending time with children who appear to have given up on having a positive future at such a young age drives home for me why MathPOWER must continue the vital work of helping students gain a stronger foothold towards achieving the education skills that will enable them to experience a higher quality of life.

Recent MCAS results demonstrate improvement in the percentage of students scoring at the proficient level or higher in math, but we still have a long way to go to achieve our goals in urban settings. Please consider supporting us in our comprehensive efforts to close the achievement gap in mathematics within urban schools. Please visit our new Web site, and we invite you to sign on to support our Mission.

Gratefully,

Cathy L. Livingston, Ph.D.
Executive Director
About MathPOWER

Mission

MathPOWER promotes transformational changes in the lives of urban youth by developing proficiency in advanced mathematics and personal resiliency. Our Mission isn’t just about students succeeding in math; it is about launching students on successful paths to pursue and complete a post-secondary education.

Vision

MathPOWER envisions a world in which all students achieve competency in advanced mathematics which serves as a gateway to lifelong learning and a productive career.

Our Focus

MathPOWER’s programs concentrate on providing:

- Direct Service to Educators and Out-of-School Time (OST) Providers (Pre-School – Grade 8) through our Coaching and Professional Development Training
- Direct Service to Students (Pre-School – Grade 10) through our Summer Academy and Math*STARS Afterschool Programs

New Opportunities!

We’ve received three recent endorsements/acknowledgements of the quality of our programs:

- 2011 Social Innovator of the Year for Working With Youth Who Are Academically At-Risk
- Selected as the 2011 Investee of Social Venture Partners (SVP)*
- Invited to participate in the 2010-2013 Boston Summer Learning Program

* The focus of our work with SVP is to build the processes we need to expand our programs to other urban areas.
Guiding Elements in Our Program Design

MathPOWER’s evidence-based programs are designed to address the key elements related to students’ achieving proficiency in math:

- Mathematical competence is cumulative. Students who do not learn the basics by third grade continue to fall behind. Students benefit from instructional strategies throughout Grades PreK-8 that continue to address the foundation skills necessary for learning more advanced math.

- Math is a gateway subject. Students who do not become proficient in mathematics will not have the same options as their peers in pursuing a college education or in meeting the demands of an increasingly competitive workforce.

- Pre-school age children benefit from opportunities to develop the foundations for acquiring Number Sense skills. As a society, we are much more aware of what we can do as parents or early childhood providers to help children acquire literacy skills compared with helping them acquire numeracy skills.

- Students who fall behind require specific interventions in order to demonstrate gains in their mathematical competency.

- Out-of-school time learning opportunities (afterschool and summer programs) increase students’ opportunity to learn and to achieve.

- Math is an abstract field of study, which through the use of experiential instructional approaches becomes more accessible to larger numbers of students.

Research has shown that the stressful conditions experienced by students in urban settings can deplete their resiliency to learn, particularly in abstract fields like mathematics. Students benefit from programming designed to increase their resiliency and persistence to goals.

This report highlights our successes and challenges in fulfilling our Mission!
Our History and Programs

Founded in 1989, MathPOWER, inspired by the work of civil rights activist Robert Moses, envisions a world in which all students achieve competency in advanced mathematics, which serves as a gateway to lifelong learning and a productive career. In response to national research studies that have identified the critical elements contributing to students’ challenges to developing competency in mathematics, MathPOWER’s Mission and Programs have evolved since its founding more than 20 years ago. Currently MathPOWER’s programs have a dual focus: through our teacher coaching programs, we train math educators to differentiate student needs, and support them in implementing best practices, and we provide direct Out-of-School Time (OST) educational services to students who live in the most under-resourced communities in Boston, MA. We have a current operating budget of $984,500 in FY 14. In recognition of our innovative, impactful work, MathPOWER was named the 2011 Social Innovator of the Year Award for Working with Youth Who Are Academically At-Risk by Root Cause, and the 2011 Investee of Social Venture Partners Boston.

Within the course of its relatively short history, MathPOWER has charted a responsive course amidst some POWERful waves of change; e.g., more rigorous standards and requirements; MCAS high-stakes testing; widening income gaps, etc. The Boston Public Schools (BPS) continue to face challenges in addressing the widening achievement gap scores that exist between more privileged school children and school children within urban environments.

Since its inception, MathPOWER has played a key role in providing professional development (coaching) to teachers within the BPS. MathPOWER began offering a summer learning program more than a decade ago; our Algebra Plus Summer Academy located at Northeastern University continues to support students’ learning of advanced mathematics. In 2007-2008, MathPOWER introduced a math intervention program - Math*GAINS (Grow Academically In Number Sense) - at the K-8 level. Our research results indicate positive trends of students’ improved scores, an outcome that begins to close the existing achievement gap.

MathPOWER opened its first afterschool program (Math*STARS) in 2008. As of September 2013, MathPOWER supports multiple after-school programs located within community-based organizations and schools, and we continue to provide training to other existing out-of-school time providers.
The Role of Mathematical Competency and Future Options

Recent research studies indicate that success in mathematical learning in middle schools is the tipping point to keeping students on a college-preparatory track in high school.

National research indicates that, ideally, students should have completed an introductory algebra course by the end of eighth grade or at least be prepared to complete algebra within their first year of high school. Mathematical competency is now assuming a role considered equally as important as literacy. Achieve Inc. research has demonstrated that students intending to enter the workforce upon graduation from high school need the same level of mathematical competency as students going on to college if they intend to enter a career path that will eventually lead to economic self-sufficiency. The rapidly evolving knowledge-based economy has led to a job market that is demanding higher-level skills.

A review of the most recent (2013) Massachusetts Comprehensive Assessment System (MCAS) scores within the Boston Public School System reveals an on-going achievement gap in mathematics:

- The percentage of students receiving “Advanced” or “Proficient” ratings in Mathematics generally decreases from Grade 3 until Grade 8. There is credible speculation that the increase in Mathematics proficiency in Grade 10 is the result of fewer students taking the exam. Many students who struggle with learning have dropped out of school by the 10th grade.
- The Boston Public School scores in Mathematics are significantly lower than the State level results. In recent years, the percentage of African-American and Hispanic-Latino students in 8th grade that score at the Proficient or Advanced levels of Math on the MCAS exams hovers between 24-27%.

TRANSITION: We are sending nearly 75% of these students to high school unprepared to take full advantage of the POWER that completing four years of high school math could provide them.

All of MathPOWER's Programs are designed to reverse the growing failure rate of students who struggle to grasp the fundamental mathematical concepts covered in grades Pre K- 9.
Direct Service to Educators (Pre-School-Grade 8): Coaching and Professional Development

MathPOWER’s main focus within professional development is providing coaching to teachers within the Boston Public Schools. MathPOWER’s coaches support teachers in a variety of ways, including:

- Promoting a deeper understanding of the mathematical content being taught
- Assisting teachers to develop a variety of educational strategies to support their students’ learning of mathematics
- Using assessment results to inform and guide instructional practice

MathPOWER coaches are known by the following hallmarks that guide their work:

- Understanding the role of sequential progression of math concepts as a prelude to mastering more advanced concepts
- Utilizing assessment data to improve students’ learning
- Understanding the philosophy and content of the major math program publishers
- Enhancing teachers’ confidence and professional judgment while promoting respect for and belief in each student’s ability to learn
- Selecting differentiated coaching approaches tailored to Beginning, Experienced, and Master Teachers

MathPOWER coaches, who for many years worked primarily in the Boston Public Middle Schools, have expanded their services to include elementary settings with an understanding of the need to prepare students for success in their middle school years.

We are finding that more out-of-school time providers are placing a greater emphasis on homework completion as part of their Mission. As a result, MathPOWER’s services are being sought to provide ongoing training and professional development to assist the staff in helping students with their math homework and enrichment activities.

MathPOWER coaches supported more than 300 Boston Public School teachers, educators, and volunteers working with students in 2012-2013.
# Impact on Teachers

## Summary of the Results

MathPOWER contracts with an external evaluator, the Donahue Institute at the University of Massachusetts, Amherst, in order to evaluate the results of our Coaching Programs. The Institute’s analysis of the data confirmed that our Coaching led to statistically significant improvements in the following areas of teacher effectiveness listed from the fall to the spring:

Both teachers and coaches saw statistically significant gains in the following areas:

<table>
<thead>
<tr>
<th>Both teachers and coaches saw statistically significant gains in the following areas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enhancing the teacher’s knowledge of the mathematics</td>
</tr>
<tr>
<td>• Scaffolding of the teacher’s lessons, working from simple to complex problems</td>
</tr>
<tr>
<td>• Differentiating instruction in the classroom</td>
</tr>
<tr>
<td>• Risk-taking by the teacher in order to alter the content of the math program</td>
</tr>
<tr>
<td>• Using an inquiry-based approach to student learning</td>
</tr>
<tr>
<td>• Developing students’ analytical skills</td>
</tr>
<tr>
<td>• Using precise math vocabulary</td>
</tr>
<tr>
<td>• Having students explain their work</td>
</tr>
<tr>
<td>• Possessing confidence in teaching number sense and fractions/decimals/percent</td>
</tr>
<tr>
<td>• Using creative problem solving</td>
</tr>
</tbody>
</table>

Teachers additionally reported statistically significant growth in:

<table>
<thead>
<tr>
<th>Teachers additionally reported statistically significant growth in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Expanding their knowledge about how students learn math</td>
</tr>
<tr>
<td>• Leading small and large group discussions of math topics</td>
</tr>
<tr>
<td>• Increasing their confidence in teaching measurement, geometry, proportionality, and algebra</td>
</tr>
<tr>
<td>• Using real world applications</td>
</tr>
<tr>
<td>• Using graphs, tables, and charts in classroom instruction</td>
</tr>
</tbody>
</table>

Coaches also reported observing statistically significant improvements in the areas of:

<table>
<thead>
<tr>
<th>Coaches also reported observing statistically significant improvements in the areas of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increasing teacher ability to assess students’ math knowledge</td>
</tr>
<tr>
<td>• Designing appropriate instruction based on diagnostic assessments</td>
</tr>
<tr>
<td>• Building on students’ strengths to facilitate learning</td>
</tr>
<tr>
<td>• Creating new teaching materials</td>
</tr>
<tr>
<td>• Departing from the text or scope and sequence</td>
</tr>
<tr>
<td>• Risk-taking to try different teaching methods</td>
</tr>
<tr>
<td>• Using cooperative learning groups</td>
</tr>
<tr>
<td>• Using hands-on activities and manipulatives (including math games)</td>
</tr>
</tbody>
</table>
Impact on Students

Summary of the Results

Our primary goals in providing coaching support to teachers include both increasing confidence and competence among teachers in designing effective instruction for students, as well as increasing students’ proficiency in mathematics.

Because of student confidentiality laws, we have to rely on measures that are available to the public, and are therefore reported in aggregate form.

We rely on multiple measures to evaluate our impact, including a new statistic being used within the Boston Public Schools, known as Student Growth Percentiles (SGPs); MCAS Scores; and BPS Predictive and Mid- and End-of-the-Year Measures. Typically, the schools in which we work show improving gains in the students’ MCAS scores – although not necessarily the same rate of gains in all grade levels. Also, we have seen schools in which we work show higher than average SGP scores – a measure that shows increased learning is occurring even if it is not yet captured in the MCAS scores.

A cursory review of the 2013 MCAS Math Scores for Boston Public Schools reveals the following benchmarks:

The percentage of students scoring at the Proficient or Advanced Levels on the 2012 MATH MCAS exam is reported as follows:

- 43% for students in 6th grade
- 36% for students in 7th grade
- 37% for student in 8th grade

The prevailing pattern is that students’ performance on the Math MCAS exam reveals a decline in the percentage of students scoring in the Proficient or Advanced categories from Grades 6-8. Anecdotally, an exodus of 6th graders transferring to the exam schools frequently explains this decrease. In reality there are probably additional causes to explain the decline.
Direct Service to OST Providers (Pre-School-Grade 8): Coaching and Professional Development

This relatively new area of focus arose in response to the increasing number of after-school or out-of-school time programs being created to support students’ academic, personal, and social development. As these Out-of-School Time programs populate, there has been increasing interest among on-site instructional staff to receive training in how to help students with their math homework. This past year MathPOWER provided yearlong workshops and coaching to the following programs:

- **Number Sense - Math Games: Fun Ways to Help After-School Students Build Math Skills** sponsored by the Fellowes Athenaeum
- **Helping Pre-School Children Develop a Strong Number Sense** offered to Site Supervisors from Smart From The Start
- **Understanding the Development of Mathematical Concepts: Pre-School to Grade 5** to Lead Teachers from the YMCA of Greater Boston

Impact on participants from...

**Fellowes Athenaeum: Number Sense – Math Games: Fun Ways to Help After-School Students Build Math Skills:**
- 33 Out-of-School Time Educators participated in the workshops, representing PreK – Grade 8 settings
- Sample Quotes:
  - “Class helped me learn ways to work with students at all grade levels and make learning fun.”
  - “Class helped me connect my understanding of math with the new ways that math is now taught in our schools.”
  - “Class has helped me help more students with greater confidence.”

**Smart From the Start: Helping Pre-School Children Develop a Strong Number Sense**
- 7 Lead Teachers from different City Centers participated
- Outcomes:
  - Teachers increased their confidence in working with children, particularly in areas related to building patterns and data representation that are precursors for learning Algebra
  - Teachers increased their ability to use real world applications or problems with all levels of students
  - Teachers learned about a wide array of hands-on activities and manipulatives that help children create an experienced-based understanding of higher level abstract concepts

**YMCA of Greater Boston: Understanding the Development of Mathematical Concepts: Pre-School to Grade 5**
- 15 participating Teacher Coordinators
- Teacher Coordinator Comments:
  - Program helped me increase my understanding of math concepts
  - Program aided me in developing a better understanding of how to use math teaching materials
  - Provided me with a much better understanding on how is being taught today
  - Saw improvement in students’ use of homework time after applying the information from this course
  - Would like additional programs that covered Algebra, Geometry, use of data, etc.
Direct Service to Students: Algebra Plus Summer Academy: Gains in Math Proficiency

Our Algebra Plus Summer Academy offers MathPOWER an opportunity to provide review and enrichment math instruction to students. Within the last four years, more than 750 students have significantly improved their scores on mastery of both review work (concepts covered within the current school year) and enrichment work (concepts that will be covered in the coming school year). The Academy has expanded its seating capacity by 150% since 2007. Within the last three years, in partnership with the BPS Math Department, special sections were created for BPS students preparing to complete Algebra I in 8th or 9th grade.

MathPOWER has participated in a pilot program known as the Boston Summer Learning Project (BSLP) since its inception in 2010. BSLP focuses on students enrolled in the most under-resourced communities within Boston. As part of this Initiative, the Summer Academy has served more than 300 students from the Dearborn Middle School and the Higginson-Lewis K-8. These students have joined other students from across the City to take part in our Summer Academy.

This past summer, we revised both our Pre-/Post Assessment Measures and our Curriculum to integrate the changes in sequencing and performance standards that resulted from Massachusetts’ adoption of the Common Core. Our experience in creating new assessment measures provided a hands-on view of the increasing difficulty and rigor associated with the new Common Core. As a result, we were somewhat cautious as to whether we would be able to achieve the same level of students’ gains as in prior years. We were very excited to see our results, and to realize that we actually exceeded our gains from prior years. Our use of the Common Core Standards allowed us to provide more in-depth instruction on core math concepts, and we attribute this in-depth focus in helping our students succeed.

RESULTS
IMPROVEMENT IN MATH SKILLS

Students attending the Academy in 2013 experienced the following improvement percentages:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Review</th>
<th>Enrichment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>100%</td>
<td>162%</td>
</tr>
<tr>
<td>7</td>
<td>128%</td>
<td>262%</td>
</tr>
<tr>
<td>8- Traditional</td>
<td>196%</td>
<td>179%</td>
</tr>
<tr>
<td>8/9 - Algebra Prep</td>
<td>147%</td>
<td>226%</td>
</tr>
<tr>
<td>9/10-Algebra II, Geometry</td>
<td>96%</td>
<td>118%</td>
</tr>
</tbody>
</table>

These results of the summer learning experience prove that taking advantage of learning opportunities during the summer months can help students gain ground in their own learning.
Students also showed positive gains in attributes associated with resiliency through increased awareness of the following areas as measured by pre- and post-assessments:

- Persistent efforts on their part can lead to their mastery of math skills
- Having a strong foundation in math increases one’s future options
- Applying oneself in middle school will impact one’s future
- Greater awareness of potential colleges to attend upon graduating from high school
- Ability to make friends and to form positive relationships with peers and adults
- Benefits of considering the consequences of their behavior before taking action

Harvard-affiliated PEAR Program (Program in Education, Afterschool & Resiliency) also used the Holistic Student Assessment (HSA) instrument to measure changes in students’ growth in five key areas: Relationships with Adults, Relationships with Peers, Perseverance, Critical Thinking, and Learning Interest.

Their conclusions about the impact of the Summer Academy include:

- Students were significantly more likely to show improvements and report scores above 4 (no change) on all five subscales
- The majority of participating students reported improvements because of their summer program
- Subscale measures showed relatively high internal validity in two areas: Critical Thinking and Perseverance

In Summer 2012, we worked with a number of Dearborn students in our Summer Academy. We compared the Fall Math ANet 1 scores and the grades of the MathPOWER Academy students attending Dearborn Middle School to that of their Dearborn peers who did not attend the Summer Academy. Our results demonstrated that those students who attended the Summer Academy performed above their counterparts:

- **79%** of 7th graders scored above the school’s 7th-grade Math ANet 1 average of 43%. The group scored an average of **9 points above** the school average (meaning a 52%) and a **median of 17 points above** the school average (60%)
- **Half** these 7th grade students were Math*STARS/Dearborn participants in 2011-2012- the previous school year
- **All 8th graders scored above** the 8th grade/school average (41%), at an **average of 22 points above** (63%), and **median of 23** (64%)
"MathPOWER has a great program. You have a great team in place!"

“Excellent program. Thank you very much.”

“It is a pleasure to have a summer program like MathPOWER Academy!”

“This is the best program ever; my son was one of the lucky participants of a full scholarship.”

“This was my child’s first year attending MathPOWER and I know this was a great educational and social opportunity for her. Thank you to the staff for investing in my child’s learning in an area that she finds difficult. I look forward to next summer, as I hope she will be able to attend again.”

“Thank you, MathPOWER for continuing to offer this wonderful opportunity to our kids. This was my daughter’s third summer and as always she who wants to come back. When I mentioned to her about working next summer (as she will be 14) she kindly reminded me that you can go to the MathPOWER Academy even if you are a high-schooler!”

“I believe that the Academy has helped our daughter grow in her math and logical thinking greatly. Her enthusiasm for math has grown profoundly. The Academy has given her a lot of assets for her endeavors for the future.”

“MathPOWER continues to be a positive experience for my child. She is going into 8th grade this year with more confidence. I appreciate the opportunity this camp provides my child each summer.”

“Well run, strong program.”

“MathPOWER is a wonderful program, and I’m happy that my daughters were able to participate.”

“Awesome, excellent program, excellent staff. Thank you. My child loved the clubs!”

“I really appreciate the work you do for our children; my child is also grateful, please keep up the great job.”

More than 70% of our parents responded to the summary evaluation questionnaire. The following is a sampling of their responses:

- My child enjoyed coming to the Academy — (98% Agree!)
- The Academy helped improve my child’s math skills— (94% Agree)
- My child enjoyed the Academy’s Club activities— (100% Agree)
- I would recommend the Academy to my friends— (100% Agree)
- Overall, this was a very positive experience for my child— 100% Agree)
Our Math*STARS programming focuses on homework completion, particularly in mathematics. In addition, our after-school programming offers structured programs that assist students in developing their leadership and resiliency skills.

We made a key decision to partner with community-based organizations and/or BPS schools that are known and respected for their quality and that are located within the neighborhoods where our students live. In 2012-2013, we had full-service Math*STARS locations at the Yawkey Boys and Girls Club, the South Boston Boys and Girls Club, and the Dearborn Middle School. In addition, we piloted an abbreviated version of our Math*STARS programming at 5 BPS schools. Our abbreviated programming focused on 8th Grade Algebra I classes: students and teachers. We provided a math coach for the 8th Grade Algebra I teachers and coordinated supplemental homework instruction for students. Students participating in our Math*STARS Programs averaged between 2-3 hours a week, yielding an additional 72-108 hours of instructional time throughout the school year.

QUICK NUMBERS FOR MATH*STARS 2012-2013:

<table>
<thead>
<tr>
<th>SITE NAME</th>
<th>TOTAL TUTORS</th>
<th>TOTAL STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dearborn</td>
<td>28</td>
<td>49</td>
</tr>
<tr>
<td>South Boston</td>
<td>34</td>
<td>259</td>
</tr>
<tr>
<td>Yawkey</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Algebra I sites</td>
<td>16</td>
<td>78</td>
</tr>
<tr>
<td>TOTALS</td>
<td>112</td>
<td>420</td>
</tr>
</tbody>
</table>
**Dearborn Middle School**

- Math*STARS/Dearborn engaged 28 tutor-mentors & served 49 Dearborn students in grades 6-8!
- Participating students showed strong progress in their math achievement scores as measured by ANet (Achievement Network) and frequently outperformed their non-Math*STARS classmates
- Besides working with students in afterschool, the Director of Afterschool Programs and the Math*STARS Site Director served 2 full days per week throughout the school year (68 full school days):
  - Tutoring small groups of students in mathematics classes
  - Observing student learning preferences and behavior in all subject-area courses
  - Participating in Student Service Team (SST) meetings focused on creating action plans with school staff to address student’s academic and social-emotional needs
  - Conferencing with teachers on student learning preferences and successful differentiated instruction techniques, as well as behavior modifications to support student learning, and
  - Recruiting students in grades 6 & 7 to attend MathPOWER’s 2013 Algebra Plus Summer Academy
- Math*STARS/Dearborn students participated in the second year of MathPOWER’s Personal Learning Plan (PLP) Project. Over the course of the 2012-2013 school year, sixth and seventh grade students enrolled in Math*STARS engaged in the organization’s Integrated Learning Model-- in-class support and pull-out math intervention, Math*STARS Afterschool programming, and math classes led by teachers coached by a MathPOWER Coach
- At Math*STARS twice per week, these students took short assessments focused on a particular Common Core Math standard, and debriefed and studied closely with Tutor-Mentors to better these skills. According to our data, students made great progress and outperformed their non-Math*STARS classmates:
  - 52% of sixth grade Math*STARS students mastered the Ratios standards, 58% of Expressions & Equations, and 50% of Geometry, while their peers mastered 48%, 42% and 36% respectively:

<table>
<thead>
<tr>
<th></th>
<th>Ratios</th>
<th>Num Sys</th>
<th>Exp/Equ</th>
<th>Geometry</th>
<th>Stat/Prob</th>
<th>Avg Mastery of all skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average score for M*S, grade 6</td>
<td>52%</td>
<td>78%</td>
<td>58%</td>
<td>50%</td>
<td>18%</td>
<td>51%</td>
</tr>
<tr>
<td>Average score for all students, grade 6</td>
<td>48%</td>
<td>40%</td>
<td>42%</td>
<td>36%</td>
<td>37%</td>
<td>41%</td>
</tr>
</tbody>
</table>

According to Spring 2012 MCAS data, Dearborn students performed poorly in Number Systems. For this reason, Math*STARS Tutor-Mentors and the Director of Afterschool Programs focused much of academic time on strengthening conceptual and computational fluency in the 4 main operations, place value, and deconstructing word problems.

**South Boston Boys & Girls Club**

- Math*STARS/South Boston engaged 34 tutor-mentors and served 259 students, representing 86% of the South Boston Boys & Girls Club youth
- Math*STARS Site Director led a Math*NIGHT program at the Boys & Girls Club. Math*NIGHT is an exposition of creative student math projects presented to Club staff, parents, and peers
• Math*STARS Site Director launched the Peer Tutor-Mentor Program as a way to engage and educate older students by giving them leadership roles and facilitating positive interactions - and ultimately relationships - between them and younger students. The Peer Tutor-Mentor Program:
  o Engaged both students who have shown a natural aptitude for leadership and service and also those who have exhibited negative behaviors that could be redirected through leadership roles and positive attention
  o Offered the opportunity for these students to complete trainings in leadership/role modeling, positive reinforcement, tutoring for mathematics, and tutoring for reading, and
  o Saw increases in student-reported comfort with leadership, communication, teamwork, self-reflection, self-evaluation, and math skills

• Math*STARS/Yawkey engaged 34 tutor-mentors and served 34 students living in Roxbury and attending the Yawkey Club

• With 34 tutor-mentors coming from Northeastern University, MathPOWER helped the Yawkey Boys & Girls Club make a stronger connection to and partnership with the University

• Math*STARS Site Director supported and led a group of Math*STARS students to represent the Yawkey Boys & Girls Club at the MA Alliance of Boys & Girls Clubs’ 5th Annual Science of Sports competition, sponsored by Raytheon and the New England Patriots

• Math*STARS Site Director created a Youth Advisory Board (YAB), designed to increase youth voice and develop skills such as leadership, communication, teamwork, and feedback. This students involved in the Youth Advisory board:
  o Designed and led workshops for their peers
  o Reported positive gains in communication skills, including confidence in their abilities to verbalize thoughts and emotions and their readiness to find compromise in the face of disagreement, and
  o Headed the application and interview process for next year’s Youth Advisory Board

Yawkey Boys & Girls Club

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Summary Evidence of Our Impact

Currently MathPOWER’s programs impact nearly 3,000 Boston Public School (BPS) teachers and students annually. In schools that engage one of our Math Coaches to assist teachers in meeting the challenges of helping students improve their math proficiency, we have seen improving results that lead to moving students from the failing categories on the MCAS to standings of Proficient and Advanced.

Our Summer Academy served over 200 students in 2013, 98% of whom demonstrated gains in their math and resiliency skills. Of particular note in Summer 2013, we were able to participate in a research project in which the Program in Education, Afterschool, and Resiliency (PEAR) – based at Harvard University – measured changes in our students’ resiliency using the Holistic Student Assessment (HAS) instrument. We were excited to learn that overall, participating students showed significant gains/improvements in the five areas associated with resiliency: Relationships with Adults; Relationships with Peers; Perseverance; Critical Thinking; and Learning Interest. The majority of students reported improvements in both their math and their resiliency because of their participation our summer program.

Our afterschool programs served more than 400 students in 2012-2013. Participating students demonstrated increases across all sites in the following areas:

- Knowing how to make friends
- Doing better in school as a result of participating in Math*STARS
- Increasing their confidence in their ability to learn math
- Acknowledging the benefits of having a “safe” place to learn and make friends

Our pilot Integrated Learning Program at the Dearborn Middle School – a setting in which we provide a Math Coach and an Afterschool Program on site – served as a model for us to pilot a similar version at 5 BPS schools with a focus on 8th Grade Algebra I classes. Our first year pilot led to impressive results: in 80% of the schools in which we piloted the program, student averages on the BPS Algebra I Final Exam exceeded the average scores for BPS students enrolled in Algebra I.
Strategic Vision and Next Steps

Year One Strategic Plan: 2012-2015

Mission: MathPOWER promotes transformational changes in the lives of urban youth by developing proficiency in advanced mathematics and personal resiliency.

Vision: MathPOWER envisions a world in which all students achieve competency in advanced mathematics which serves as a gateway to lifelong learning and a productive career.

FY 2012-15 Objective:

As a recognized expert in effective learning environments, MathPOWER will demonstrably improve the math proficiency and resiliency of nearly twice as many students by building the organizational and financial capacity and market position to grow and replicate our integrated and traditional models in close partnerships with carefully selected schools and other organizations.

<table>
<thead>
<tr>
<th>GOALS:</th>
<th>FY 12</th>
<th>FY 13</th>
<th>FY 14</th>
<th>FY 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>See Table 1</td>
<td>See Table 1</td>
<td>See Table 1</td>
<td>See Table 1</td>
</tr>
<tr>
<td>Reach: Schools and Organization</td>
<td>9</td>
<td>19</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Total Students</td>
<td>1930</td>
<td>2920</td>
<td>3685</td>
<td>4060</td>
</tr>
<tr>
<td>Total Teachers</td>
<td>39</td>
<td>65</td>
<td>89</td>
<td>115</td>
</tr>
<tr>
<td>Staffing: Full Time</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Part Time</td>
<td>42</td>
<td>48</td>
<td>71</td>
<td>85</td>
</tr>
<tr>
<td>Volunteers</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
</tr>
<tr>
<td>Total Annual Budget</td>
<td>$824,572</td>
<td>$1,154,257</td>
<td>$1,596,057</td>
<td>$1,690,558</td>
</tr>
</tbody>
</table>

7. Establish MathPOWER as a Recognized Expert: Establish MathPOWER as a recognized expert and thought leader in creating effective learning environments

8. Build Effective Partnerships: Build and nurture partnerships to ensure MathPOWER’s sustainability and efficient use of resources, enhance reputation, and promote visibility and innovation

1. Client Impact: Using the attached table, identify the indicators and data needed and establish baseline measures to guide selection of target goals on an annual basis for increasing math proficiency and resiliency.

2. Refine Measures of Impact: Create a rich repertoire of assessment measures to demonstrate impact of MathPOWER’s program and goals

3. Build High-Performance Organization: Build a high performing, innovative organization that ensures responsive, quality programming supported by experienced, dedicated staff

4. Develop Healthy Revenue Model: Develop revenue model to ensure financial health of organization

5. Build Robust, Engaged Board: Build robust, fully-engaged, participatory Board with 10-15 members

6. Codify Core Program Elements for Quality Replication: Identify core elements for signature Programs and create supporting materials to support quality expansion/replication of programs

7A Create a communications/public relations plan
7B Identify resources/staff responsible for publishing research results
7C Increase MathPOWER’s staff’s presentation at state, regional, and national conferences
7D Increase MathPOWER’s presence in City- and State-Wide initiatives focused on educational reform

8A Develop rubric to assess “Mission fit or benefit” of potential partners
8B On an annual basis, identify key partnerships and develop plans to nurture and stay connected
8C Create process/protocol for nurturing partnerships
8D Create strategy to keep key MathPOWER Staff/Board Members informed about key partnerships

4A Design financial planning model that considers costs/impact of all program models
4B Create goals, plans, and ownership for diversifying funding sources
4C Increase percentage of revenue from fee for service programs and Board contribution and involvement
4D Create systems/protocols (PT Director of Development) to support pursuing other funding sources

5A Inventory current Board skills/networks, identify skills/networks needed, identify gaps and first priority needs
5B Expand Board Membership to include individuals with identified priority skills/networks
5C Develop high level roles/responsibilities, expected term limits and financial contributions
5D Develop interview process for potential Board members
5E Share needs/openings with networks

6A Create a Manual addressing the Hallmarks of MathPOWER’s Coaching Program
6B Create a Manual for Designing/Overseeing MathPOWER’s Math*STARS Afterschool Programs
6C Create Manual for Designing/Overseeing Quality Summer Academy Programs
6D Identify/solicit feedback from qualified reviewers
6E Pilot models with current and new staff
How Can You Help?

MathPOWER’s Mission is critical to supporting students’ success in developing mathematical competency within the Boston Public Schools. There are many ways in which you can assist our organization. Financial support is critical, as well as Board or Volunteer support in the areas of fundraising, marketing, evaluation, advocacy, and increasing our impact. Anyone who is interested can visit our website (below) for more information on how to become involved.

We are also interested in volunteers who can help us increase our use of technology and social media. If you would like to learn more about MathPOWER’s programs and impact, please contact the Executive Director, Dr. Cathy L. Livingston.

We have multiple volunteer opportunities that include working directly with students or with MathPOWER staff. We are grateful to Northeastern University for granting us office space and for allowing us to use their facilities to run our Summer Academy. We are also grateful to the Massachusetts Promise Fellowships organization, which has provided us with Fellows who oversee our after-school programs and are helping us build our capacity.

Finally, we are grateful to our funders and our many volunteers who help support our programs.

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To learn more about us and become involved, you can visit our new web site at www.mathpower.neu.edu
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