

In the 21st century, we need the talents and contributions of all learners to enrich our communities, and it's up to us to act boldly on behalf of all students. The lack of student proficiency in math has proven to be a persistent and complex challenge in many schools – one that indicates an urgent need for new approaches, broad engagement, and targeted impact to better prepare students for academic and career success and keep Boston a city of inventors and innovators. From our success expanding arts education at scale in Boston over the last six years, we know change is possible and are ready to direct our most effective strategies in a new area to drive impact.

WHY FOCUS ON MIDDLE GRADES MATH?

While many reports highlight that only one-third of Boston students are proficient in literacy by the third grade, far less attention has been paid to the fact that only one-third of Boston Public School students are proficient in math by the eighth grade. This is a quiet crisis in education, in urban schools in particular, as math proficiency is a key indicator of student readiness for high school academics, a foundational skill needed for all STEM fields of study, and a predictor of post-secondary success.

Middle grades math proficiency is a path to college completion. Research shows that proficiency in math in the middle grades leads to the completion of more rigorous math courses in high school which in turn leads to a higher rate of college success and completion. Students' completion of advanced math courses in high school is more highly correlated with college graduation than any other factor—including family background. Students who take math beyond Algebra II increase their likelihood of persisting to sophomore year in college by about 20 percentage points and nearly double their chances of earning a bachelor's degree.¹

21st century jobs require math proficiency. Math provides the foundational skills needed for jobs in a variety of high demand and well-paying fields. Employment in Science, Technology, Engineering and Mathematics fields (known as STEM) is growing at almost twice the rate of non-STEM jobs. In STEM disciplines alone, 36,000 fewer associate and bachelor's degrees will be granted in Massachusetts than the state's workforce will need by 2020.² Women and men of color continue to be under-represented in these fields.³

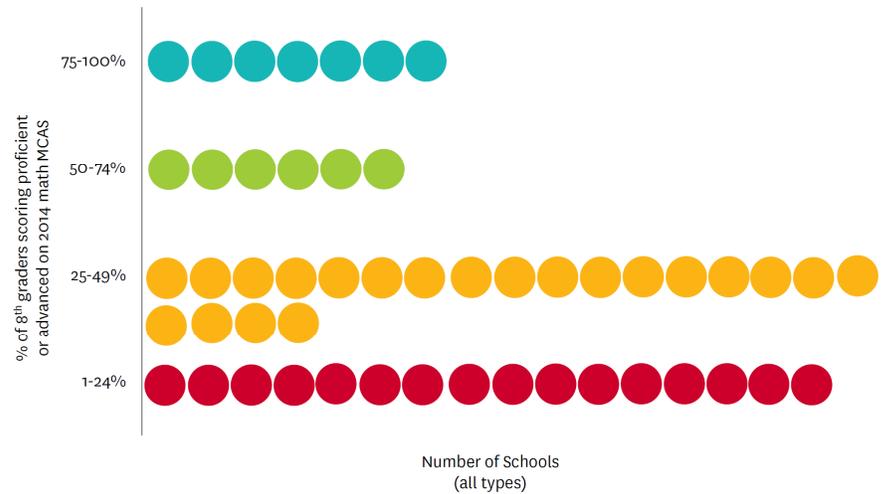
Students like math. While adults commonly share stories of math anxiety, 70% of Boston fourth graders report liking math "very much" or "quite a bit." Seventy percent of eighth graders also said they like math and 56% identified math as a favorite subject.⁴ In 2012, nearly half of the Boston Public School graduates who reported their post-graduate plans indicated an interest in a STEM-related college major.⁵

We need to do better. Despite the documented need and interest in math as a subject and as a marker for college and career success, the data show that our schools haven't positioned students for academic and career success in math. The need for action is clear.

MIDDLE GRADES MATH: WHERE ARE WE NOW?

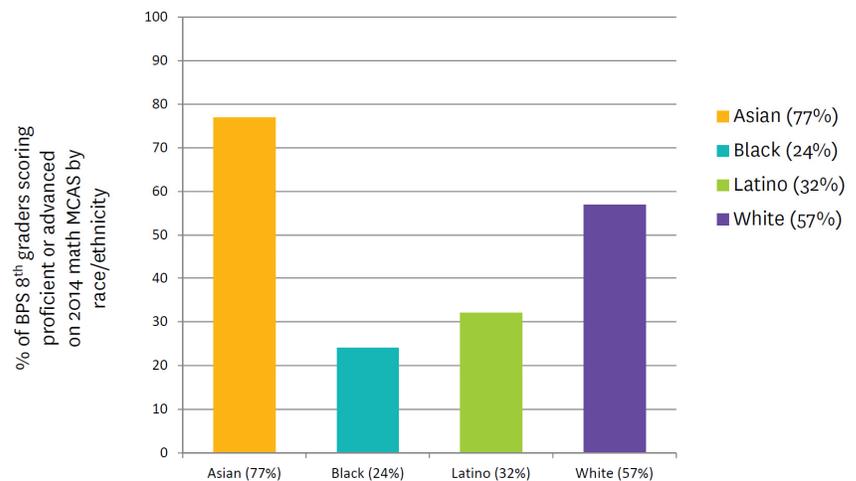
Figure 1

The Challenge: There are 50 public schools in Boston serving eighth graders, including BPS district and charter schools of all types (Commonwealth charters, Horace Mann in-district charters, pilot schools, Innovation and traditional district schools). Currently only seven of those schools have 75% or more of their students scoring at the proficient level or above on the eighth grade math MCAS. Most of those 50 schools have not been able to get the majority of their eighth graders to achieve math proficiency (*See Figure 1*).



Perhaps even more concerning are the significant achievement gaps that remain between white and Asian students and their Black and Latino peers in Boston Public Schools (*See Figure 2*). The data indicates that significant numbers of middle school students in Boston have not mastered the foundational math skills required for on-going academic success. While the data focuses on eighth grade math, we know success in eighth grade depends significantly on what happens in earlier grades to prepare students.

Figure 2



The Opportunity: This is a solvable problem in Boston. Just 50 schools teach the city's 13,500 middle grades students, a manageable number to effect change. However, it requires a multi-pronged solution that includes:

- Setting a shared goal for impact
- Supporting rigorous math instruction in classrooms
- Developing teachers' content knowledge
- Using creative tools and strategies to support both struggling and accelerating students
- Working with families to support student success
- Engaging a wide variety of stakeholders
- Conducting and disseminating research on what works in middle grades math

The shift to the Common Core in math provides an opportune moment to make a major change in approach to teaching and learning math for everyone. If we want to accelerate the number of students graduating from high school and getting to and through college, we need to start the work sooner by focusing on the critical middle grade years to lay the foundation. It is imperative to offer more urban students the opportunity to master the skills and knowledge needed for success in college or other post-secondary pathways, meaningful employment and active citizenship in our global economy.

EDVESTORS' APPROACH TO TARGETED IMPACT

Our new **Targeted Impact: Zeroing in on Math** initiative will build on EdVestors' 12 years of experience identifying, shaping and scaling the most effective strategies for urban school improvement to dramatically improve student proficiency in middle grades math across Boston. EdVestors will replicate the multi-pronged approach that achieved significant impact for BPS Arts Expansion and apply lessons learned from our broader work through the School Solutions Seed Fund, Improving Schools Initiative, School on the Move Prize and previous efforts in 8th Grade Algebra.

Our ultimate goal for Zeroing in on Math is to increase the number of Boston schools that are able to educate at least 75% of their students to proficiency in math by eighth grade. We will work with cross-sector partners to take a truly systemic approach that understands and addresses the complex issues of equity and quality in education from many different perspectives. Broadly, we plan to employ the same methods and levers that made our BPS Arts Expansion work so successful, including:

STRATEGIC PHILANTHROPY

Deploying philanthropic dollars in a coordinated way to incent participation, galvanize results, and increase public funding to sustain impact over time.

COMMON AGENDA

We will convene a broad array of stakeholders and collaborators to work toward a shared goal, leverage our collective resources, and engage in collaborative problem-solving.

SHARED MEASUREMENT

The number of schools with 75% student proficiency in 8th grade math will be our primary student-focused metric which we will measure consistently over time.

LEAD PARTNER

EdVestors will act as the convener, guiding strategy and effective implementation across multiple schools and partners.

MULTIPLE STRATEGIES

We will coordinate mutually reinforcing activities that impact students, build public will, and share knowledge.

FRAMEWORK FOR SCHOOL IMPROVEMENT

We will integrate what we know and have learned about how schools improve with a focus on five key practices for school improvement drawn from our past work (Figure 3).

FIVE KEY PRACTICES FOR SCHOOL IMPROVEMENT

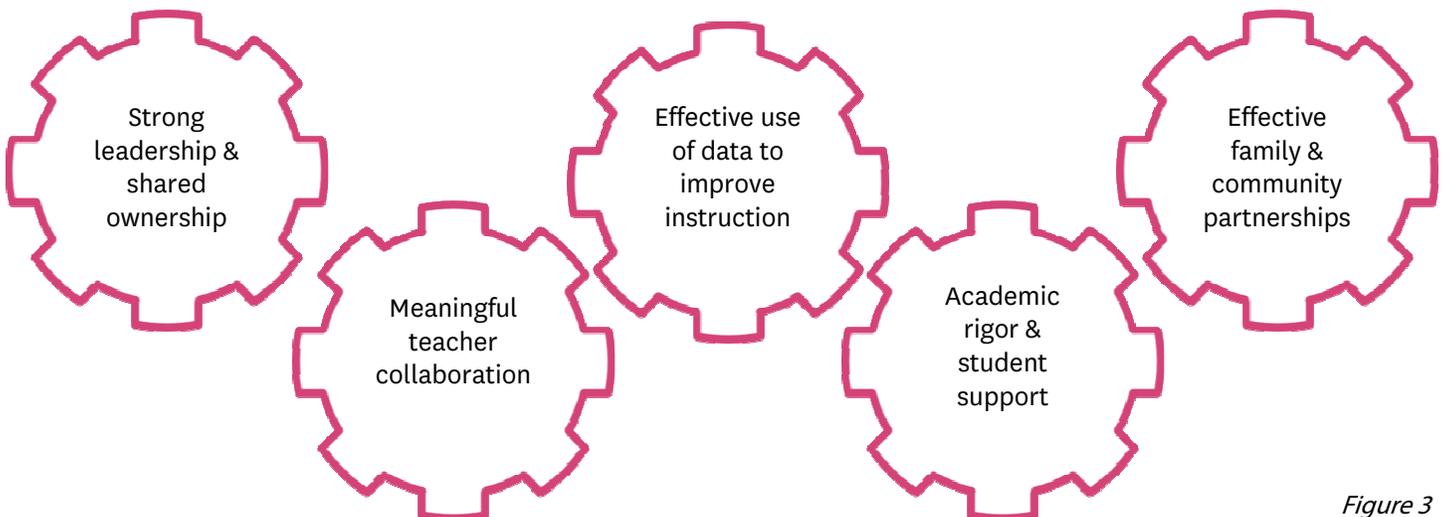


Figure 3

PLANNED ACTIVITIES & TIMELINE FOR ZEROING IN ON MATH

To inform the development of **Targeted Impact: Zeroing in on Math**, EdVestors sought the input of a wide range of stakeholders and on-the-ground experts. Discussion groups with charter and district school leaders and teachers, visits to schools that are high performing in middle grades math, and consultation with academic experts in this area provided invaluable insights. These conversations, in conjunction with a quantitative review of achievement data, form the basis of our planned activities outlined below.

LAUNCH: SPRING 2015

Landscaping and Baseline Data Collection: We will begin with a landscaping study to fully assess the current state of middle grades math instruction across all 50 schools in Boston, including school and classroom level structures for teaching math such as curriculum, time and approach. We will also conduct a deeper analysis of existing data sources to examine math performance such as how student subgroups perform in middle grades math.

Piloting Strategies for Results: All pilot activities will be assessed to identify best practices that can be shared more broadly across schools.

- Using a strategic grantmaking approach, we will provide incentive and resources to schools to test a range of intervention strategies to fill critical gaps in students' mathematical knowledge and fluency. We will encourage pilot interventions, including blended learning and the use of technology and identify school partners through an open and competitive application process.
- We will support the assessment and pilot adoption of new district curricula, led by the BPS Math Department, as well as teacher professional development in key Common Core aligned instructional strategies in development with Boston University.

Stakeholder Engagement and Activation: EdVestors will convene math teachers and school leaders across district and charter schools, along with funders, higher education partners and STEM stakeholders to advise our team, build support for our work and help problem-solve as the various components of the approach are implemented.

GOING DEEPER: SCHOOL YEAR 2015-16

In-Depth Research: We will begin the design of an effort to more deeply identify the teacher knowledge and practices that lead to student success in math, in collaboration with higher education and evaluation partners, and create a system for collecting on-going information from teachers to inform our work.

Teacher Training and Leadership Development: With the advice and guidance of educators in the field, we will develop and implement a plan to assess teacher needs, provide math content knowledge and strategies for teaching middle grades math aligned with the new Common Core and Massachusetts Curriculum Frameworks, and offer ongoing coaching and support, initially with a pilot cohort of teachers and/or schools. We will engage schools—charter and district—that are both high-performing in middle grades math and those focused on improving achievement.

REFERENCES

1 Final Report of the National Mathematics Advisory Panel (2008), Boston Higher Education Partnership (2009), U.S. Department of Education (Adelman 1999, 2006); 2 MA Dept of Higher Education; 3 National Mathematics Advisory Panel, 2008; National Research Council, 2007; 4 National Assessment of Educational Progress data 2011 and 2009; 5 Boston Private Industry Council.

FOR MORE INFORMATION

Janet Anderson, Executive Vice President, Anderson@edvestors.org
Marinell Rousmaniere, Senior Vice President of Strategic Initiatives, Rousmaniere@edvestors.org

To Invest: Anuradha Desai, Senior Vice President of External Relations, Desai@edvestors.org