

New Visions for Public Schools
Investing in Innovation
Absolute Priority 3, Standards and Assessments

New Visions for Public Schools: A(2)I (Accessing Algebra Through Inquiry)

INTRODUCTION

Through the occasionally contentious rhetoric swirling in the current education reform debates, three core issues stand out as both indisputable and utterly critical to our students' future success: 1) the need for high-quality, thoughtful implementation of the Common Core State Standards and the development and delivery of standards-aligned curriculum and assessments; 2) the STEM crisis, particularly the prevalence of the mathematics achievement gap in urban districts; and 3) the need for highly effective instructional strategies that address the needs of struggling students, which is too often compounded by the dearth of well-designed professional development. These challenges cut across national, state, and local lines, and, in their present state, suggest a steady and seemingly inexorable decline in American students' achievement.

This decline need not be inevitable. Over the last decade, researchers have developed increasingly sophisticated tools for assessment and instruction based on an emerging understanding of student learning and the nature of mathematical competency. Forty-four states have adopted the Common Core State Standards. To make the transformation of math instruction a reality, we must restructure the way we teach mathematics in conjunction with the adoption of standards and materials. For far too long, teachers have been essentially passive recipients of policy, curricular, and professional development reforms, which often change from year to year, are siloed by grade level or department or school, and as a result have little widespread impact. In order to succeed in providing high-level instruction, teachers require a combination of applicable and appropriate instructional materials, an organizational framework supporting their use at the school, district and state levels, and continued training and collaboration around how best to implement them. This coherence, when enacted successfully, has an extraordinary impact on teacher practice and student learning, but is scarcely seen in our urban districts. The studies of Bryk and his colleagues in high needs schools in Chicago provide substantial evidence that coherence matters.¹

New Visions for Public Schools (New Visions), in partnership with the Silicon Valley Mathematics Initiative (SVMI) and the New York City Department of Education (NYC DOE), proposes the Accessing Algebra through Inquiry program (henceforth "A(2)I") that will maximize student and teacher mathematics learning to create the Bryk framework² in 30 high-need secondary schools. Teacher-led inquiry teams, supported with intensive training and ongoing targeted professional development, will use research-based assessments and carefully designed and learner-responsive formative assessment lessons (FALs) to ensure that students have the opportunity to learn the kind of mathematics they will need to succeed in higher

¹ Bryk, 2010.

² Bryk, Sebring, Allensworth. 2010.

education and more demanding work environments. Based heavily on student data and reliant upon the ongoing collaboration of teachers around students' academic progress, these inquiry teams will alter instruction in the classroom and change whole-school norms – making the simple but critical shift from 'what are we teaching our students?' to 'what are they *learning*?' to improve learning outcomes. Building upon New Visions' expertise around teacher inquiry as a vehicle for school improvement, together with SVMI's years of research on high-quality assessments, the (A(2)I) project will provide teachers with a coherent approach to planning, executing, and refining instruction that uses student work and conceptual understanding as a starting point to improve mathematics achievement for thousands of students.

Accessing Algebra Through Inquiry

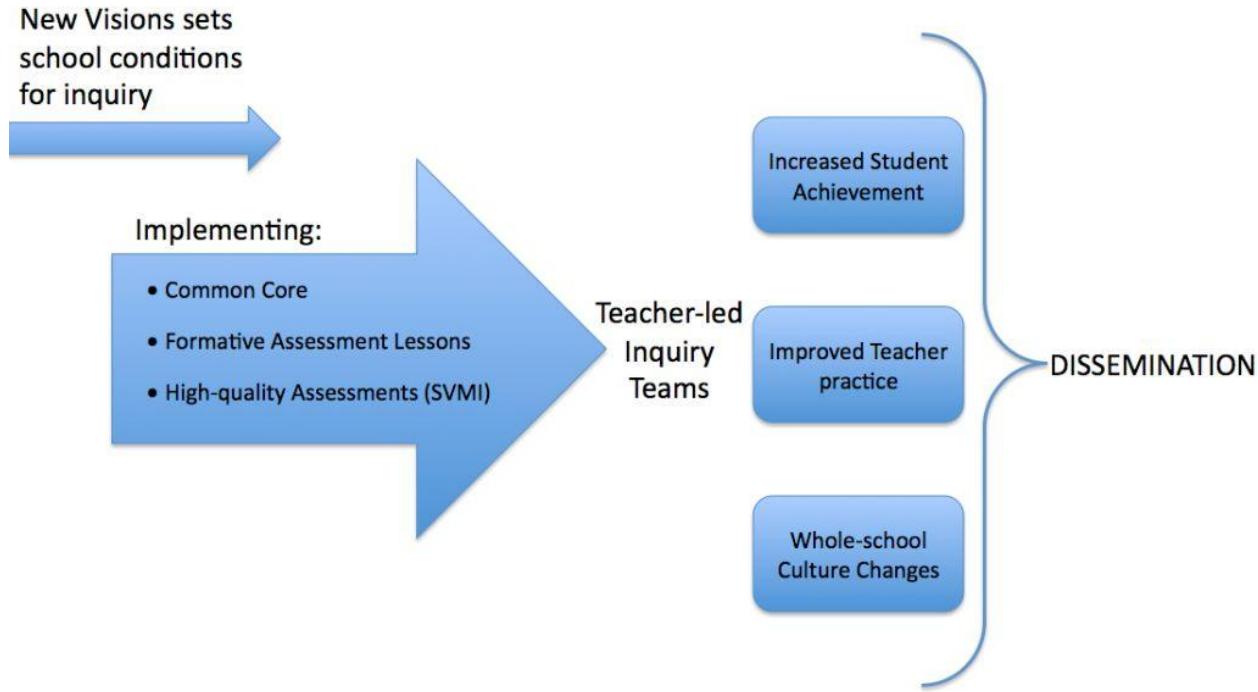
Studies of mathematics education reform show that a sharp distinction exists between a standards-based curriculum and the accompanying instructional practices, recognizing that the two are inter-connected and that the one cannot be effectively reformed without the other.³ Over the course of the five-year period, New Visions and SVMI will be working with 30 of New Visions' partner NYC public high schools, both district and charter, to develop the A(2)I program. In ten schools per year, on a two-year cycle of implementation spanning ninth and tenth grade Algebra I and II and Geometry, we will be working with schools to preliminarily assess existing instructional systems and working conditions to establish the conditions for this type of work; train teachers and administrators on the use of the inquiry framework with MDC and SVMI materials; provide intensive ongoing professional development as teachers grow comfortable with the process and move into more ambitious instruction; and study and document both the process itself and resulting teacher, student, and whole-school outcomes. New Visions' A(2)I Dissemination & Knowledge Management Center will serve as a model for use by other districts and as a standard toolkit for the New York State rollout of RttT-mandated inquiry teams.

The A(2)I project will have the following main goals:

- 1. *Create school conditions conducive to collaborative inquiry*** in 30 NYC public and charter schools, through work with principals and instructional leadership teams by New Visions' Leadership Development Facilitators (LDFs), Instructional Specialists, and school partnership staff as well as SVMI Facilitators.
- 2. *Translate the Common Core Standards into practice*** through the use of high-quality assessments and related formative assessment lessons, using the SVMI assessments and MDC lessons delivered using New Visions' research-based method of teacher inquiry.
- 3. *Increase students' math learning and achievement in high-need secondary schools*** by implementing inquiry-based instruction focused on 'getting small to get big' using formative assessment lessons
- 4. *Increase teachers' pedagogical content knowledge and instructional effectiveness*** in math through ongoing professional development on key mathematical concepts and the delivery and effective use of assessment tools
- 5. *Ensure that effective use of inquiry and formative assessments becomes a part of the schoolwide instructional culture***, included in determinations of teachers' effectiveness

³ Stein & Smith, 2010; Cohen & Hill, 2003; Ball & Cohen, 1996

- and used across content areas
6. ***Develop a Dissemination & Knowledge Management Center to support the development and implementation of Common Core-aligned formative assessment lessons in conjunction with inquiry work***, to be utilized with New Visions' technical assistance at the City, State, and national levels and to inform teacher preparation and development in New York City, Boston, and beyond.



This work builds upon three central areas of research and experience:

- ✓ **The effectiveness of Learning Teams/Inquiry Teams** as an instructional model, leading to increased teacher collaboration, whole-school culture changes, and improved student outcomes.
- ✓ **The impact of high-quality assessments and formative assessment lessons**, such as SVMI's and MDC's, on driving teacher and student learning.
- ✓ **New Visions' ongoing success as a school developer and manager** with the New York City and State systems – most notably in the creation of its small schools, which employed learning teams as a central strategy – and its experience in working with schools to implement the elements required for successful school-based reform efforts

Creating and sustaining the conditions necessary to enact such reforms in schools, New Visions will work closely with partner principals in its charter and traditional public schools to support the rollout of this model in collaboration with SVMI; an advisory committee consisting of state and national experts will provide feedback and ongoing research to support quality implementation and widespread dissemination.

Inquiry. The inquiry model, whether termed Learning Teams or Lesson Study or simply Teacher Inquiry, is an iterative process in which teachers work collaboratively to continually consider the research, rationale, and data behind their decisions about curriculum and instruction. They use the inquiry framework to collect evidence of student learning through formative assessments, analyze patterns of student thought through examination of their work, collaborate with their team to develop hypotheses to investigate, and refine instruction based on what they learn. This process is based on the knowledge that collective analysis of student work in order to modify instruction is a crucial tie to strong instructional practice and resulting student growth. Saunders et al. found that the learning teams in the Los Angeles Unified School District had a significant impact on student and teacher learning, resulting in improved student outcomes and changing the nature of teachers' interaction in the involved schools⁴ [as detailed in the Evidence section].

Using inquiry as our foundation, the A(2)I Program will create a multi-tiered system to further both student and teacher learning. At the grade level, inquiry will build teachers' conceptual understanding of mathematics as they determine and deliver the most appropriate performance assessments within their curricular scope, analyze the mathematical content together with students' thought processes based on their responses, and to re-formulate instructional strategies to address identified student needs. Thus teachers will be increasing their pedagogical content knowledge through this process. At the departmental level, inquiry meetings - with a discussion of a common problem related to practice, to which everyone present can relate – will result in what Tharp and Gallimore refer to as a 'joint productive activity' of reimagining the instructional systems used in schools. Teachers will move beyond the reengagement of students who failed lessons to rethink strategies of instruction more broadly. This systemic rethinking of the curricula will institutionalize better practices over time.⁵ As they assume greater facilitative roles at the grade and department level, teachers will develop a stronger distributed leadership among themselves, and will potentially grow into more formalized leadership roles.⁶

Using formative assessments to drive learning. The A(2)I program will use Mathematics Design Collaborative (MDC) formative assessment lessons, which incorporate formative assessments as a method of unpacking student thinking and focusing on those areas proving a struggle. These lessons will serve as "deep-dive" formative assessment lessons – placed strategically throughout the existing school curricula to provide intensive exploration of certain concepts based on trends in student data. The SVMI assessments will be used to determine these trends and to explore students' conceptual understanding; SVMI's intensive coaching and professional development in delivery and analysis of these assessments, and the refining of instruction in response, will provide teachers with actionable, targeted strategies for addressing students' difficulties through changes in their practice.

⁴ Saunders, Goldenberg, & Gallimore, 2009.

⁵ Tharp and Gallimore, 2008.

⁶ Ermeling, 2010

A. NEED FOR THE PROJECT

Research confirms that literacy in mathematics for the typical student is critical to her success as an adult: A strong grounding in high school mathematics through Algebra II or higher correlates powerfully with access to college, graduation from college and earning in the top quartile of income from employment. This is particularly for African-American and Latino students: “The achievement gap between students of differing ethnic and socio-economic groups can be significantly reduced or even eliminated if low income and minority students increase their success in high school mathematics and science courses.”⁷ The competitive advantage gained by math savvy students is only likely to increase as jobs rapidly expand in the math- intensive science and engineering workforce by a magnitude of three to one.⁸

Student performance on a national scale. Against the overwhelming evidence about the importance of mathematics, American students continue to flounder in acquiring critical math skills and understanding, particularly as they reach adolescence. America’s own “National Report Card”, the National Assessment of Educational Progress (NAEP), has shown progress in the lower grades, but older students continue to perform poorly on the assessment. Only 32% of our nation’s students are above the proficient level in eighth grade, a level that drops to 24% by Grade 12. These assessments are confirmed by the demand for remedial courses at the college level. And they are made all the more disturbing by the persistent, endemic disparities in mathematics achievement related to race and class – a recent study of 250,000 11th graders taking the ACT test in 2010, for instance, found that Hispanic and black students performed well below their white counterparts in all Common Core math domains.⁹

In too many instances, growth in student achievement has stalled or is not sufficient to ensure that students graduate ready to succeed in a post-secondary college or career pathway. The fact that too many students require remediation upon admission to college, fail to complete the freshman year, and/or fail to graduate from a two- or four-year college underscores the need to align K-12 standards to post-secondary requirements for success. Students’ ongoing exposure to low-level math and science coursework, and lack of demand from the existing standards for high-level math skills, is undercutting their ability to pursue STEM careers.

If it is not addressed, this declining achievement poses direct threats to the United States’ continuing global role. The well-being of nations is entwined with the ability of their people to deal with sophisticated quantitative ideas. During the 20th century, the United States possessed a peerless mathematical prowess— measured not just by the depth and number of mathematics specialists, but by the ability of large numbers of people to use fundamental mathematics training in such diverse areas as engineering, finance, commerce and science. Unless dramatic action is taken, the United States’ advantage on the world stage will continue to erode.¹⁰

⁷ Evan et al., 2006.

⁸ Pres Math Advisory, Carnegie Report. FIX ALL CITATIONS!!

⁹ ACT, *A First Look at the Common Core and College and Career Readiness*, 2010.

¹⁰ President’s National Advisory Panel on Math, 2008.

Challenges of Adopting the Common Core. The Common Core State Standards set ambitious goals for mathematics learning. They will require rethinking not only how to teach mathematics, but a fundamental shift in what mathematics needs to be learned. In addition to more sophisticated content, students will be expected to learn “mathematical practices” including:

- making sense of problems and keep trying even when problems are challenging
- using numbers to describe situations
- justifying their strategies and listen to see if other people’s ideas are logical
- making models of situations
- using a variety of mathematical tools
- trying to be accurate
- using the structure of a problem to help them find answers

As part of implementing the Common Core, New York State plans to change its assessments, curriculum materials, professional development programs, and teacher evaluation systems. These changes will have a radical impact on classroom practices. As the National Council on Teaching Mathematics (NCTM) has suggested, higher-level mathematics requires student discussion of core concepts as a foundation for increasing students’ understanding.¹¹ Based on questioning rather than telling, and on sharing the responsibility for exploring these questions between teacher and students, inquiry-based strategies are essential to change the entire classroom orientation in the A(2)I schools. Truly effective teachers must provide individualized instruction based on formative assessments in such a way that it increases the knowledge and deepens the skills of *all* students in the class, who in turn are given the space within which to make mistakes, process, discuss with peers, ask why, have a discussion, and then try again.

This is a fundamentally necessary shift in high-need schools, as teachers’ typical feedback from assessments often has a negative impact on low-achieving students, who internalize wrong answers as an indication that they are unable to learn.¹² Encouraging student discussion within the framework of responsive instruction removes the stigma of being ‘wrong’ and replaces it with students’ exploration of their own and their classmates’ thinking on conceptual questions. Yet this is not the typical structure of secondary mathematics learning in urban classrooms, which tends to skew toward the rote recitation of facts and a rapid question and answer format, leaving the underlying conceptual framework unexplored¹³; it will require a substantial change in the way that teachers understand their role, and in the amount of control they exercise over student responses and actions within the classroom. As detailed in the management plan, New Visions instructional specialists and the SVMI team will work closely with teachers in their first year of implementation to scaffold this transformation to what Lampert, Boerst and Graziani, among others, have deemed “ambitious instruction”.¹⁴

¹¹ NCTM, 2009.

¹² Black et al., 2004

¹³ Cazden, 1988.

¹⁴ 2010.

Low Levels of Math Achievement in New York City Public Schools. With one million students, NYC is the nation's largest district and also one of its most diverse; 86% of the student population are children of color. Nearly 62% meet the federal high-poverty guidelines, 16% receive special education services, and 14% are designated as English language learners.¹⁵ Many high school students are performing well below grade level in reading and math; while the city has made some strides, high school graduation rates still hover just above 60%, and many who graduate are not well-prepared for post-secondary success. The achievement gap persists even in the face of many well-intentioned reforms, particularly in math; in 2006, for instance, African-American and Hispanic students entered ninth grade 30 to 40 percentage points behind their white classmates as determined by eighth grade assessments.¹⁶

The majority of NYC students who graduate high school and are accepted to a two-year college require significant remediation in math – more so even than in literacy. Schools in New Visions' own network data, drawn from the 74 schools enrolling 35,000 students, points to the genesis of this issue; many of the students are far behind in their knowledge of core concepts when entering high school, and as early as the beginning of second semester in SY 2010-11, 43% fell behind on the path to high school graduation by failing to obtain the required Math credits by the end of the ninth grade. For our highest-performing students, 43% fall “off track” into the lower performance brackets by the end of their Junior year in high school because they are unable to pass the NYS Math Regents at the required 75 score to bypass remediation courses in college.¹⁷

New York City and State Commitment to Inquiry. For the past seven years, New York City has supported the implementation of teacher-led, data driven inquiry. Today, nearly 7,500 teacher inquiry teams meet in New York City public schools. In 2010, New York State mandated that the 700 districts throughout the state use inquiry as a vehicle to implement the Common Core throughout the state. A central tenet of the application is to use inquiry teams to facilitate Common Core implementation, as we propose here to do. The state also calls for increased use of formative assessments to guide student learning and builds out the required elements for high school graduation, including college and career readiness as a focal point. Mathematical fluency - including algebra and passage of the freshman year Algebra Regents exam - is now considered a requirement for students to develop the skills they need for success in post-secondary life. Teacher expectations and evaluations have shifted, as well; NYS is putting into place an evaluation system incorporating multiple measures of teacher effectiveness. The inquiry process and increased collaboration, both of which have been shown to improve teachers' practice, form the basis of the statewide recommendations for advancing instructional proficiency.

New York State and City have made the commitment to use data-driven instructional cycles, or inquiry - first developed by New Visions, Baruch College and the NYC DOE in 2004 - to drive the implementation of effective practices and the Common Core. Recent analysis suggests that

¹⁵ New York City Department of Education, 2010.

¹⁶ New Visions data, retrieved July 25, 2011.

¹⁷ New Visions for Public Schools data, retrieved July 25, 2011.

NYC inquiry implementation varies considerably;¹⁸ there is clearly a need in mathematics to create and modify Common Core curricular modules and implementation rubrics and codify best practices around specific subject matter instruction to ensure that the school system's commitment to inquiry fully transforms math instruction for our highest-need students.

B. PROJECT DESIGN

In the following, we set forth our approach for ensuring that students in high-need schools in New York City – and potentially the state and nation - are receiving the instruction and support they need to succeed in the critical areas of secondary mathematics. Our strategy combines three key levers for change: 1) high-quality, evidence-based assessments and formative assessment mathematics lesson materials aligned to the Common Core; 2) effective, actionable professional development in implementing these assessments and lessons through teacher-led collaborative inquiry; and 3) strong partnership with the school communities to enact the requisite conditions and support for teachers. In concert with one another, we believe that these three elements will create a profound shift in teacher and student learning, enabling our students to gain the mathematics knowledge and understanding they require to be successful in their post-secondary life.

Core Project Elements

New Visions and SVMI will work with each A(2)I school – ten in the first year, an additional ten in the second, and another ten in the third [see Timeline for school rollout details] - to perform a diagnostic, determining student learning gaps, needed interventions and potential assessments and formative assessment lessons. New Visions' math Instructional Specialists will work with departmental teams, first for an intensive week in the summer with SVMI assessment specialists and then two hours a week after school throughout the year, to help them become comfortable with the math to be taught as well as the various strategies through which to teach it. New Visions Leadership Development Facilitators (LDFs), data specialists and community engagement teams will work with principals and across the community to ensure optimal scheduling, school culture, data capture capacity and other conditions conducive to implementing this work effectively – including its use in teacher evaluations for the participating schools.

Inquiry teams. As critical as materials are to effective growth in math, the enacted curricula created by teachers in their classrooms is more important. Over the past twenty years, under names ranging from teacher research to Japanese lesson study to inquiry groups and learning teams, collaborative inquiry has emerged as a proven means of supporting teachers, building their capacity to implement complex curricula and reform initiatives, and improving student achievement. New Visions and SVMI will engage and support teachers in the inquiry cycle, which includes the following key steps:

- Analysis of student data and identification of student needs prior to the implementation of the specific formative assessment lesson, or FAL

¹⁸ Talbert, 2008.

- Implementation of the FAL and an intensive examination of classroom discussion, assessments of student understandings evidenced by student discussion, work and self-identified need
- Identification of gaps in curriculum, pedagogical approach, and school support systems
- Modification of the units, selected re-teaching and the provision of additional opportunities for practice and analysis of key concepts or types of problems

New Visions Instructional Specialists will facilitate the inquiry work at the teacher, classroom and departmental team level. New Visions will be videotaping and documenting the inquiry process to create its Dissemination & Knowledge Management Center for use with New York State Networks as well as the NYC DOE, the Boston replication sites through BPE/BTR, and teachers and school leaders in other districts throughout the nation.

SVMI Assessments. SVMI assessments, in combination with aligned professional development, provide significant scaffolding for teachers, giving them the tools they need to examine and respond to student struggles both individually and in the context of the class as a whole. As they see trends in students' lack of understanding, they can utilize the SVMI strategy (taught through the SVMI professional development component) of "re-engagement", which moves away from the traditional re-teaching of challenging concepts to a student-led discussion of possible approaches – thus reinforcing the concept for those who performed well on the assessment, while also providing a nonthreatening and creative way to revisit the concept for those who were having difficulty.

SVMI has compiled a bank of performance assessment formative assessment lessons, rubrics and anchor papers from the Mathematics Assessment Resources Service, also known as the Balanced Assessment. Each task comes with a rubric, anchor papers and a history of performance by students in the San Francisco Bay Area. SVMI will work with New Visions and the A(2)I schools to:

- Provide technical support in administering and scoring the formative assessment lessons quarterly throughout the school year.
- Provide professional development to score the student work on each task. The scorers use the associated rubric and anchor papers to standardize scoring procedures in order to utilize comparison data from other district and scores from previous years.
- Train LDFs and NV instructional specialists to work with teachers to use the scored formative assessment lessons to make instructional decisions.
- Help teachers to compare their data with the overall data, and compare the growth of their students from one test opportunity to the next.

Mathematics Design Collaborative. MDC materials allow teachers to choose and use mathematics FALs that entail complex mathematical work and build basic skills. These lessons quickly enable teachers to identify appropriate mathematical learning goals, interpret students' responses, and formulate and lead class discussion of key mathematical ideas, questions, and/or solutions based on the response analysis. They establish relevance between mathematical concepts and the day-to-day practical problems that math confronts and solves, developing norms for mathematical and respectful talk, posing strategic questions and signaling what it

means to be “good at math.” Perhaps most importantly, they provide teachers with support diagnosing common and unexpected patterns of student thinking; in the A(2)I model, teachers will then work with their inquiry team to determine the optimal strategies for addressing both the large-scale and more individualized student struggles with content.

Objectives

We propose implementing the A(2)I strategy in 30 high-need New York City public district¹⁹ and charter schools over the course of the five-year grant [see list of participating schools in Appendix H], with a six-month planning period prior to implementation. We will prepare tools and strategies that can be disseminated to inquiry teams that are now being established throughout New York State.

New Visions and SVMI have established the following objectives to evaluate the combined use of assessments, FALs, and inquiry in mathematics classes and its impact on teacher practice, student learning and leadership/whole-school culture:

1. *We will work with a total of 30 NYC public and charter schools to implement the A(2)I work over five years [see rollout schedule in Section H], reaching one-third of our PSO network and all of our charter schools by Year 3.*
2. *All principals in the A(2)I schools will incorporate the effective use of inquiry and algebra formative assessment lessons as an integral part of the rubric for mathematics teacher evaluation.*
3. *80% of students taught through this method will pass the Algebra I Regents with a 65 or higher.*
4. *90% of the schools involved in this initiative will use learning regarding the use of formative assessments and inquiry into their work in other departments and academic areas.*
5. *75% of students taught through this method in Algebra I and Geometry (mandated NYS courses for high school graduation) will choose to take Algebra II (non mandated for graduation). At least 70% of students taking Algebra II, Trigonometry will complete the course and pass the state Algebra II/Trigonometry exam.*
6. *Lessons implemented through this initiative, as well as videotaped inquiry sessions, teacher survey results, and evidence of changes in student learning and teacher practice, will be housed in a Dissemination & Knowledge Management Center made public in Year 2 and beyond.*

¹⁹ New Visions works with these schools under contract with the NYCDOE and provides intensive support around instruction, leadership coaching, data collection analysis and human capital.

7. *At least three city and state network of schools will make use of the resources accessed through the Dissemination & Knowledge Management Resource Center in the second year. The number of networks in New York State and across the country will expand in the subsequent years: 10 additional networks in the third year, 20 additional networks the fourth year and 30 additional networks the third year.*

Project Strategy

New Visions' approach is exceptional in that it connects research-based, Common Core-aligned high-quality mathematics with a proven system for supporting and pushing effective teacher practice in a way that is scalable. The following explains the New Visions and SVMI strategy for ensuring highly effective implementation of the MDC work with whole-school, team-based and teacher-specific support systems and structures.

New Visions and SVMI will:

1. Provide schools and teachers with support to assess students and modify their curricula.

New Visions will provide a weeklong summer institute each year to prepare teachers and school leaders for project implementation, incorporating a three-day intensive training on understanding and implementing SVMI tools (performance formative assessment lessons, rubrics, scoring protocols, expert investigations) and two days of learning how to deliver formative assessment lessons through inquiry work with department teams. During this time, NV Instructional Specialists will be working with each teacher team to determine best FALs to use and how to align the existing Algebra I [and beginning in Year 2, Geometry and Algebra II] curricula with MDC materials and the SVMI assessments, and the Advisory Committee will begin its work with the involved teacher teams.

2. Build the capacity of teacher collaborative inquiry teams.

Led by the Director of Instruction at New Visions with advisement from SVMI, six New Visions Instructional Specialists will work with five schools each to establish and built the capacity of math inquiry teams. The instructional specialists will help their schools organize either a math department or grade team to effectively implement the SVMI assessments and MDC formative assessment lessons via teacher inquiry.

Using the inquiry process described above, the Instructional Specialist will work on site with each school team to first review and select quarterly SVMI assessments and eight MDC lessons [eight FALs in Algebra I in the first year; repeating those eight with an additional six in Geometry in Year 2; repeating those fourteen with an additional eight in Algebra I in Year 3] to be implemented based on an initial diagnostic assessment of their specific students, trends in past student data, and an examination of the current curriculum scope and sequence. Teachers will then use the formative assessment lessons (FALs) with their students, coming together as a school-based inquiry team with their instructional specialist to analyze results and determine

their next instructional steps based on both individual and group patterns of student thinking in relation to various core mathematical concepts.

3. Work with school leadership to create and sustain the conditions for supporting inquiry teams and fostering continuous improvement.

In addition to the instructional specialist working closely with the algebra teams, New Visions will have a Leadership Development Facilitator (LDF) assigned to each A(2)I school. Each LDF will work with principals and teams of teachers to set the conditions for, and support, the inquiry work and the delivery of assessments – ensuring that the A(2)I work is taken on as common language throughout the school, and can form the basis for whole-school reform efforts. Through this work, the school community will gain insight into students' learning needs across content areas and re-align its efforts to target those specific needs. LDFs will also work closely with principals to ensure that teacher effectiveness decisions in each school are made based upon teachers' adoption and use of formative assessments and the inquiry method – in mathematics only in Year 1, and spreading to other content areas in the third year of a school's A(2)I involvement. We will work across the grant period to reduce and eliminate the teams' dependence on outside facilitators.

4. Provide intensive data support and analysis.

New Visions will use its robust Datacation system and online tools [see full description of data tools and functionality in Appendix H] to facilitate a technology-enabled peer network for A(2)I participants, enabling teachers to document their work, analyze student performance data, and collaborate on refining the inquiry modules and assessments. As part of their commitment to the A(2)I program, the principals of all participating schools will agree to make A(2)I a primary focus of school improvement efforts and will enable math teachers to use designated administrative time to work on inquiry-based lessons, reflection, reviewing and editing classroom videos, and coaching.

A key part of sustaining this type of project is building data practices that can support the rigorous evaluation of teacher practice. The math inquiry teams will provide a constantly updated and growing pool of information on student learning and progress, as well as insight into the obstacles outside of the classroom that block high levels teaching and learning in math. Data from the inquiry process will also be used by the team and New Visions to examine broader systems, including grading, homework, and attendance policies, to ensure that they support effective math teaching and learning. New Visions' existing data systems will enable each school, its leadership and teachers, to use A(2)I to inform and support instruction, professional development, curriculum planning, accountability, and policy.

5. Provide ongoing professional development.

Semi-annual School Team Retreats: In addition to school-based support, A(2)I retreats will provide opportunities for the A(2)I school leadership teams to work intensely together, with community partners and coaches, to look at data, revise action plans and identify their needs moving forward. School teams will use this focused, off-site time to access expertise across a variety of areas to ensure that they are preparing students for mastery of algebra: curriculum,

instruction, assessment, accountability, special needs, youth development, recruitment and teacher training, scheduling, resource allocation and more thorough sessions at the retreats.

Seminars: Based on data and feedback from schools on their interests and needs, New Visions will design and facilitate seminars for school leadership and teachers to pursue in-depth learning on specific math topics. The seminars will be organized as a limited set of meetings but may lead to extended professional development opportunities if principals or practitioners decide to pursue a related topic over more time.

Workshops: New Visions will offer monthly Math Study Groups on discrete areas of concern and open to all members of New Visions' network, ensuring that the A(2)I work spreads. New Visions will publicize different seminar and workshop offerings as early as possible to ensure that schools can plan to attend sessions that are relevant to their work. Outreach to schools will include a regular calendar of events that will be published and distributed on a monthly basis.

C. STRENGTH OF RESEARCH, SIGNIFICANCE OF EFFECT, AND MAGNITUDE OF EFFECT

The targeted use of inquiry teams and cross-school seminars to teach Algebra I and II and Geometry is grounded in theory and research on adult learning,²⁰ standards for effective professional development,²¹ and organizational learning and change. Available evidence suggests that, effectively scaffolded, the inquiry-supported implementation of high-quality formative assessment lessons promotes learning that is authentic, engaging, and sustained in a community of peers, and is essential to ongoing improvement in student outcomes.

Emerging research suggests that this strategy has encouraged leading mathematics educators to explore the use of collaborative inquiry in conjunction with the implementation of new mathematics curricula, guided by high-quality, aligned assessments. Deborah Ball and her colleagues have concluded that mathematics teachers need sustained, systematic opportunities to develop their practice in ways that are related to their students' needs and the challenges they face in the classroom.²²

Engaged in this inquiry cycle, the A(2)I algebra teachers can focus on implementing the new modules, assessments and other materials with higher commonly shared standards and expectations for all students. Curricular modules and units are, in this way, used as a frame give real meaning to student data, enable educators to draw instructional implications from their understanding of their students, support them in translating this understanding and analysis into action, and flexibly deliver mathematics building on students' individual academic, social, and developmental needs and interests. The A(2)I math teachers will be able to confront key questions that are not always systematically adopted in curricular adoption that stretch to

²⁰ Bransford, Brown & Cockings, 1999.

²¹ National Association of Secondary School Principals, 2004

²²L. Ball & D.K. Cohen, 1999.

the very core of teaching: Is my own practice with particular materials improving the academic achievement of students in my classroom or school? What specific adaptations or adoptions must I take with these students and my colleagues to improve student achievement?

Teacher learning teams. Research has found that teacher collaborative inquiry such as that proposed here can improve student achievement in multiple settings. Under names ranging from teacher research, to Japanese lesson study, to inquiry groups and learning teams, collaborative inquiry has emerged as a promising means of supporting teachers, building their capacity to implement complex curricula and reform initiatives to improve student achievement. Despite differences in nomenclature, effective teacher learning teams incorporate four important characteristics –characteristics that underpin New Visions’ inquiry model:²³

- solving job-embedded and relevant problems related to the learning needs of specific individual and groups of students within the teacher’s control,
- planning and implementing instructional solutions in classrooms,
- using evidence to drive teacher reflection, analysis and next steps, and
- establishing cause-effect findings about teaching and learning by working toward detectable improvements in student achievement

Saunders and his colleagues found in a five-year quasi-experimental investigation that grade-level inquiry teams using a focused protocol to solve instructional problems have significantly increased achievement, and that teachers involved in the inquiry protocols shifted attribution of improved student performance to their teaching rather than to external causes. Schools with teachers in teams increased in their statewide ranking an average of 17%, compared to 3% in other schools. Teachers’ causal connections then fostered acquisition of key teaching skills and knowledge such as identifying student needs, formulating instructional plans and using evidence to refine instruction. Saunders and team indicate that these outcomes are likely when teams are teaching similar content, led by a trained peer-facilitator, using an inquiry-focused protocol and have stable settings and support to engage in continuous improvement—as is the case in the New Visions’ inquiry model.²⁴

Similarly, Glenn Daley and his colleagues in LAUSD’s Department of Research & Planning conducted an independent evaluation of student outcomes connected with teacher collaborative inquiry teams. The analysis was based on student growth as measured by achievement on the California State exams. A comparison group of non-Learning Teams schools was used to help ensure that observed LT outcomes were not the result of disproportionate implementation in schools unlike other schools in LAUSD. Their report indicated that schools with at least one high-implementing workgroup showed slightly higher growth than demographically matched comparison schools in most subjects, and impressively higher growth in a few subjects, including ELA grade 11, Algebra grades 8 & 10, History/Social

²³ Ermeling, 2010.

²⁴ Saunders & Gallimore, 2009.

Studies grade 8, Science grade 8, and Integrated Coordinated Science 1.²⁵ In similar interval analysis, New York City researchers found that students targeted for math support through teacher team work outperformed their peers in math. After controlling for prior years' scores, elementary and middle school students who were targeted in math gained .11 more on the proficiency rating scale from 2007 to 2008 than did students who were not targeted²⁶.

New Visions has cultivated established grade-level and departmental inquiry teams through the SAM program in its partner and created schools; Stanford University researcher Joan Talbert and colleagues have found that these approaches have increased student achievement and teacher collaboration, built a culture of personalization and accountability, and have gotten many more students "on track" to graduation.²⁷ The strength of this work has led to the adoption of New Visions' inquiry model across the entirety of New York City's public schools as well as in Boston and Oakland. We expect similar results as we intensify our existing inquiry work in conjunction with the MDC formative assessment lessons.

Formative and summative assessments. SVMI has integrated its research-based assessments into a larger framework of school improvement, providing scaffolding for teachers and school leaders to understand assessment results, analyze student responses through an intensive scoring process allowing the teachers themselves to revisit core concepts and their application, and then re-examine instructional strategies to maximize learning based on the assessments and on their colleagues' feedback. This work stems from numerous studies pointing unequivocally to the improvement of formative assessments as a key factor in student achievement gains²⁸.

Formative assessment lessons. The MDC work is the expansion of an NSF-funded collaboration with UC Berkeley, which formed the Mathematics Assessment Resource Service (MARS). In a multi-year study of the MARS formative assessment lesson implementation through the Mathematics Assessment Collaborative (MAC), a consortium of 30 public elementary school districts in California organized by SVMI, David Foster and colleagues found sustained improvement in student achievement as measured by state exams; a second study with updated results found continued growth.

MDC materials allow teachers to choose and use mathematical formative assessment lessons that connect the above skills, engaging students in complex mathematical work. Changing the teacher-centered classroom dynamic, these lessons help teachers scaffold this mathematical complexity and student learning over time through a method of questioning rather than telling. The MDC formative assessment lessons permit teachers to design and individualize instruction, enhance mathematical proficiency and teach responsively. This draws upon extensive research

²⁵ Daley, 2008.

²⁶ New York City DOE data, sent in personal communication August 1, 2011.

²⁷ Talbert, 2008.

²⁸ Black et al, 2004.

documenting the use of formative assessments as crucial levers to determine student understanding and refine instruction in response.

D. EXPERIENCE OF APPLICANT

New Visions for Public Schools

New Visions has a long history of successfully leading this type of initiative to improve educational opportunities and student achievement. Examples of projects and their significant impact on students, schools, the New York City school system and the education field include:

- *Small schools creation.* We worked with the Bill & Melinda Gates Foundation, the Carnegie Corporation and the Open Society Institute—as well as with the NYC DOE, the United Federation of Teachers (UFT) and more than 200 community partners—to start 99 new small high schools serving 37,000 New York City public school students. In 2009, our schools had an average four-year graduation rate of more than 72%, ten percentage points higher than the citywide average, with much higher graduation rates for special education students and English language learners (ELLs). They also had substantially lower dropout rates. MDRC’s recent study, further described below, validated the impact of our small schools work on student achievement.
- *Inquiry teams and the Scaffolded Apprenticeship Model.* In 2003, New Visions created the inquiry-based Scaffolded Apprenticeship Model (SAM) as an alternative to traditional principal training programs. Its aim was twofold: put instructional leadership at the center, and locate the training inside real schools, creating a new generation of exceptional principals prepared to lead high-need, urban public high schools. To date, New Visions has worked with 34 schools to certify 115 new school leaders, with an additional 68 currently participating. The model was adopted, and has also been validated in its impact on student achievement, in Boston and in Oakland, CA. As important, in 2007, the New York City DOE adopted SAM’s cycle of inquiry as a key component of its new accountability system. Today, every public school in the city is required to assemble a SAM-like inquiry team to focus on moving struggling students, and there are nearly 7,500 inquiry teams working in NYC schools.
- *Urban Teacher Residency.* New Visions’ Urban Teacher Residency (UTR) program will prepare 200 new teachers in the next five years. Designed around SAM principles, UTR places aspiring teachers in schools and trains them extensively in the collection and analysis of student assessment data. Curricular content directly supports participants’ work with students, and graduation is contingent on their ability to demonstrate progress with a small group of struggling students. The alignment of UTR with SAM creates a coherent human capacity continuum, enabling New Visions to recruit, train, and advance exceptional teachers and leaders for our schools.
- *School support structures.* We now serve as a Partnership Support Organization (PSO) to 76 schools, with 35,000 students. New Visions’ PSO network, which is equivalent in size to the Pittsburgh or San Jose school systems, serves a higher percentage of African American, Latino, low-income, ELLs and special education students than the city—with a higher graduation rate.

- *Innovation laboratory.* We have successfully disseminated innovation across the largest public school system in the country. We pioneered new data tools, including an “on track to graduation” metric that is now being used in all New York City public high schools, where it is having an impact on the education of more than 250,000 students [see Appendix H for an overview of New Visions data tools].

Significant improvements in student achievement. New Visions’ efforts have created startling, historic results. MDRC, an independent, highly-respected policy research firm, released a report commissioned by the Bill and Melinda Gates Foundation showing that New York City’s first 105 small high schools – two-thirds created through the New Visions process— increased students’ likelihood of earning credits, progressing through school and graduating in four years with Regents diplomas. In these small schools, the study found:

- By the end of their first year of high school, 58.5 percent of enrollees were on track to graduate in four years (as measured by credit accumulation and number of Regents exams passed) compared with 48.5 percent of their counterparts in other schools. These positive effects on students’ graduation prospects were sustained over the next two years.
- By the fourth year of high school, overall graduation rates increased by 6.8 percentage points (68.7 percent vs. 61.9 percent), which is roughly *one-third the size of the gap in graduation rates* between white students and students of color in New York City. Most of the effect on graduation was driven by an increase in New York State Regents diplomas.
- These schools’ positive effects are seen for a broad range of students, including male high school students of color and students with lower academic proficiency, whose educational prospects have been historically difficult to improve.

To understand the significance of this work, consider that in 2001, only one in three students graduated in the failing schools. Today, many of the small schools in these same buildings routinely graduate more than 72% of their students. The report concludes that in four short years, New Visions contributed to the creation of a high school system the size of Houston that is working for our neediest students.

Silicon Valley Mathematics Initiative

Developed in 1996 through a partnership between the Noyce Foundation and the Santa Clara Valley Mathematics Project at San Jose State University, SVMI is a comprehensive effort to improve mathematics instruction and student learning, through the use of a formative and summative performance assessment system, pedagogical content coaching, and leadership training and networks. SVMI involves several interrelated components that include the following:

- ***Professional Development with an Emphasis on Algebraic Reasoning*** SVMI focuses on the key strategies of professional development, math content coaching, and performance assessments, with the goal of ensuring that student achievement as measured against national math standards will improve. The professional development programs involve teachers, math coaches, and site leaders in year-round math content sessions, summer institutes, professional growth workshops and math network

meetings. Principals and key district personnel attend training in instructional leadership, school change, and math pedagogical content knowledge.

- **Content Coaching** Through intensive in-class coaching, SVMI supports math teachers to improve instruction by focusing on important content and by developing techniques to support all students. Coaching involves an ongoing process of pre-teaching conferences, in-class experiences, and post-conferences.
- **Assessment** Within its member school districts, SVMI sponsors the annual administration of the MARS exam, a summative math performance assessment to measure students' ability to solve non-routine problems, explain and justify their solutions and promote high level thinking skills. Student work is analyzed so the thinking and misconceptions can be reported to the schools to inform teachers and support improved instruction. Each year the results of the MARS exam are reported to all stakeholders in the school system.

SVMI's supports are designed to encourage and facilitate cross-district learning, with the monthly meetings dedicated to sharing findings on the results of assessments, patterns and trends in students' thinking, and effective interventions. SVMI has engaged for more than a decade in the implementation of its MARS assessment work with additional deep support structures and professional development. A recent analysis of a long-term SVMI project using Lesson Study, or Teacher Inquiry, to implement the assessments has shown that it had considerable impact on teacher practice, student understanding, and student achievement, driving significant changes in instruction and in students' mathematical understanding.²⁹

E. EVALUATION

Rockman et al, an independent research firm with extensive experience studying school change initiatives—including those designed to improve teaching and learning in high-need schools—will conduct the A(2)I external evaluation. Questions guiding the study include:

- What are the critical, measurable features of the A(2)I program's professional development and instructional components, and how effectively do teachers apply them to practice?
- Do A(2)I teachers demonstrate greater pedagogical content knowledge, more positive attitudes toward teaching math, and more frequent assessment and learner-centered teaching practices compared to teachers in matched "peer group" schools?
- Do students of A(2)I teachers show greater learning and achievement as measured on standardized mathematics tests (e.g., Regents exams), and more positive attitudes toward mathematics than students in comparable "peer group" schools? What features of the A(2)I program are most closely linked to positive student outcomes?
- How effectively does the A(2)I program create school conditions that are conducive to collaborative inquiry work?
- Do research-based teacher inquiry and the use of high-quality assessments and related tasks help teachers meet the Common Core standards?

The evaluation, which will use a mixed-methods research design, will be divided into two phases. In the first phase (Years 1-2), REA will conduct an in-depth implementation study of the

²⁹ Waterman, 2010.

A(2)I professional development and collaborative inquiry work and their effect on teachers' knowledge and practice. They will also develop a measure of program fidelity, pilot test student measures, and conduct initial assessments of the project's impact on students' performance, based on formative assessments, grades, and the current Regents exams. In Phase 2 (Years 3-5), they will continue to examine the quality of implementation, but also conduct a quasi-experimental study, initiated in Year 3 and replicated in Years 4 and 5, that compares the mathematics performance of students in A(2)I schools to that of students in matched comparison schools. The study will include approximately 40 schools, 80 teachers, and 1600 students per year, which will provide sufficient power to establish the impact of the program. Rockman et al will secure NYCDOE IRB approval and collect necessary informed consent forms prior to any data collection.

The proposed study is based on a combined theory-of-change³⁰ and outcomes-based model³¹. The use of both approaches will allow us to determine what works and what doesn't, and document why and how. This can help program designers and implementers achieve greater clarity about what they are trying to do, allow the logic of the program components and their hypothesized relationships to be examined and tested, and guide decisions about which aspects of the implementations merit measurement and analysis. Once the program's theory of change is established and programmatic components and outcomes aligned, an outcomes-based model will be employed to provide formative data on the program's progress and summative data on its impact.

Articulating programmatic components and the links between implementation and outcomes will be especially important for A(2)I for two reasons: First, because teachers in both A(2)I and comparison schools take part in inquiry teams, mandated by the NYCDOE in its new accountability system, it will be necessary to establish precisely what is different in A(2)I schools—what changes when teachers speak a common language and schools wholly support collaborative inquiry, and inquiry teams are an integral part of research-based instruction. Second, as the project is scaled up and replicated in other settings, school leaders need clear guidelines about what practices and programmatic components are most demonstrably linked to positive outcomes for students, and what is required to bring about change in whole-school norms.

Implementation Study, Years 1-2

Rockman et al will use multiple strategies to monitor implementation. During the Year 1 planning period, summer training, and initial implementation, they will develop valid indexes of the A(2)I inquiry teams and classroom implementation of MDC and SVMI materials, following a process described by Mowbray, Holter, Teague, & Bybee (2003) that involves identifying measurable "critical components" of a program, collecting data to measure them, and collecting evidence on the reliability and validity of the measures. Data collection tools validated in Year 1 and used for the remainder of the study include:

³⁰ Connell and Kubisch, 1995

³¹ Schalock, 2001

Observations, videotape reviews, and teacher artifacts. In collaboration with New Visions and project partners, REA will create classroom and inquiry-team observation protocols with a checklist of factors required for implementation fidelity. Protocols will draw on New Visions' inquiry model and existing instruments, such as the Mathematical Quality of Instruction (MQI) protocol under development for high school algebra classrooms³², and include items to capture discourse among teachers as they plan, execute, and refine instruction. REA will observe a sample of team meetings and classrooms and collect artifacts in both A(2)I and comparison schools, then use project video for further analysis of artifacts, team meetings, and practice. The total observation sample will include a third of the participating schools, purposively selected. Observation strategies established and validated in Year 1 will be repeated in Years 2-5.

Interviews and focus groups. Using structured interview protocols, Rockman et al will conduct annual interviews with a representative sample of school principals, department chairs, and Instructional Specialists. These will focus on inquiry-team work, changes in practice and performance, and the development of a supportive school culture. Teacher focus groups (face-to-face in the observation sites and by phone in remaining sites) will be conducted semi-annually in Years 2-5, in a representative sample of one-third of the A(2)I and comparison sites.

Teacher and student surveys. Teacher surveys, administered annually to all participating teachers, will explore capacity among math team members, school conditions, teachers' comfort teaching mathematics, and beliefs about their ability to have a positive effect on student learning. Among existing tools from which items will be adapted is The Mathematics Teacher Efficacy Beliefs Instrument (MTEBI)³³. At the start, middle, and end of school year, students in A(2)I and comparison classrooms will complete surveys to gauge changes in attitudes toward math. Survey items will come in part from the attitude and confidence subscales of the Fennema-Sherman Mathematics Attitude Survey.³⁴

Student content measures. In Years 1 and 2, Rockman et al will use a combination of grades, formative assessments, and Regents exams to assess student learning. Where possible, REA will draw on the data available through Datacation and online tracking tools.

Data Analysis. In Years 1 and 2, Rockman will look for trends in the qualitative data that can be explored on a larger scale, e.g. comparison of observation data from the inquiry teams and classroom implementation to determine which practices transfer from one context to the other. REA will also conduct Analyses of Covariance (ANCOVAs) to assess initial program impacts. Statistical models will include pre-survey responses and demographics as covariates, and incorporate implementation measures, such as the number of MDC and SVMI assessments or lessons enacted over the year. The small sample size of the pilot limits the analysis to a single level (student) and will not account for variations within and between classrooms.

³² Hill et al, 2008

³³ Enochs, Smith & Huinker, 2000

³⁴ Fennema & Sherman, 1976

Quasi-Experimental Study, Years 3-5

A quasi-experimental study, begun in Year 3 and replicated in Years 4 and 5, will compare the performance of students' in A(2)I teachers' classrooms to that of students in comparison schools.

Sample. Data across years will be pooled to generate a sufficiently-powered sample size for analysis. By Years 4 and 5, this will include at least 20 schools per condition. Rockman et al assumes at least two teachers per school and 20 students per class, producing a total sample of 40 schools, 80 teachers and 1600 students. This sample size will provide a minimum detectable effect size of 0.28; this assumes that power = 0.80, that pretests will explain 80% of the variance in the outcome variable and intraclass correlation coefficients of 0.08 and 0.12 at the school and classroom levels respectively.³⁵

The treatment group will include 10 New Visions schools per year, where A(2)I is implemented in grades 9 and 10. REA will select matched comparison sites for each school, using demographic data and the NYCDOE Progress Report's "peer group" schools whose students enter high school with similar 8th grade test scores. Evaluation will confirm the appropriateness of the peer group matches with a propensity score matching analysis³⁶, using a logistic regression equation to model treatment assignment on a variables potentially related to treatment assignment: such as average years of teaching, school performance, and student demographics.

Measures. REA will repeat measures used for the implementation study, except in the case where a new Regents sequence is in place. Evaluation will include comparison of end-of-year Algebra I and II Regents scores and student mathematics attitudes, focusing on items that test specific areas covered in MDC and SVMI assessments and tasks. To see how students apply skills even if content is not covered, items that assess mathematical practice skills will also be identified. A(2)I students will complete MDC summative assessment tasks on a topic they studied but did not do an assessment on. As appropriate, A(2)I students will also be compared to comparison group students on other available school measures, including credit accumulation, course selection, and receipt of the Advanced Regents' Diploma.

Data Analysis. Rockman et al will conduct an intent to treat analysis³⁷ using hierarchical linear modeling (HLM)³⁸ to determine the impact of A(2)I on student outcomes. They will conduct separate HLM analyses for each outcome measure (i.e., mathematics knowledge and attitudes); models will include pretest scores, prior year's standardized test scores, and teacher and student demographic variables as covariates. Post-hoc analyses of subgroups will be both top-line and by categories of interest, such as high needs schools vs. others, or schools with 2-5

³⁵Hedges & Hedberg, 2007; Spybrook, Raudenbush, Congdon & Martinez, 2009.

³⁶Dehejia & Wahba, 2002

³⁷Justice, Mashburn, Pence & Wiggins, 2008

³⁸Siner & Willett, 2003

years of A(2)I experience vs. first-year programs. They will also conduct Treatment on Treated analyses, which consider the effect of variations in implementation on outcomes.³⁹

F. STRATEGY AND CAPACITY TO FURTHER BRING TO SCALE

Partnership with the City and the State. In 2010, the New York State Department of Education officially established “Network Teams” to assist networks of schools with developing capacity of district leaders, school leaders and teachers in instruction, curriculum, and data. Network teams have the specific responsibility of differentiating and turn-keying NYSED training and drive a cultural change in schools through professional development – particularly around what is being taught, how it’s being taught, and what to *do* about obstacles to student learning. The State has specifically mandated that network teams must work with schools to provide training around data driven instruction and school-based inquiry cycle. New Visions will work with the NYC DOE and the NYSED to ensure that best practices from the A(2)I project are incorporated into network discussions. The A(2)I Project promises to direct, tangible and sustainable affect nearly 2.7 million students in New York City and New York State.

State and National Dissemination/Knowledge Management Center. The A(2)I Project is built around the Common Core implementation, and as such, is both highly relevant and easily replicable throughout the country. New Visions considers itself and its work as open source innovation and has a long history disseminating it broadly to other schools and district in New York and across the nation. New Visions has regularly created media materials, documentary films on specific practices, national reports and testimony to disseminate its practices.

National partners in current innovation projects include the Carnegie Foundation for the Advancement of Teaching, the Aspen Institute, the American Federation of Teachers, the University of Chicago Center on Urban Education and others with the express purpose of documenting and disseminating promising strategies and practices to districts and frontline practitioners. We have also developed partnerships with individual districts outside of New York State around innovative practices, such as teacher inquiry (Boston and Oakland) and new teacher support (Baltimore and Austin).

We will use similar strategies here. As part of the A(2)I Project, New Visions, SVMI and its partners will build a national Dissemination/Knowledge Management Center to ensure that the strategies, tools and other materials will be available to hundreds of schools struggling to effectively implement the Common Core standards in math. These resources will take multiple forms, including, but not limited to,

- A national visitors program to proactively inform teachers, administrators, policy leaders and experts about the use of FAL and inquiry teams to drive student achievement;
- A video library of classroom instructional practices, keyed to specific FAL and assessments, to enable practitioners to see effective instruction associated with lessons for individual teacher’s preservice and inservice preparation, training and reflection and to jumpstart schools and districts own teacher driven inquiry;

³⁹ Hulleman & Cordray, 2009; Justice, Mashburn, Pence & Wiggins, 2008.

- Regular participation in policy forums and other venues to assist the New York City and State Education Departments to roll out data driven teacher inquiry and raise student mathematics achievement;
- A national technical assistance center to provide support to teachers in conjunction with our national partners, like the Carnegie Center for the Advancement of Teaching and the American Federation of Teachers;
- White papers (like recent publications around school facilities, data driven instructional practices, student metrics and small school development) that will be disseminated through the New Visions website, our partner's websites and other print media.
- Quarterly press releases and impact reports that combine strategies implemented, data on impact, and testimonials from practitioners.

All resources will be maintained on the New Visions and SVMI sites. This virtual resource library will serve as a strong mechanism for replication, providing potential partners with information and analysis on the SVMI assessments and the MDC task implementation as integrated with inquiry. At the state and national level, as districts grapple with the optimal methods through which to deliver Common Core-based assessments and integrate both aligned curricular materials and accompanying high-quality instructional strategies - the A(2)I Resource Library will become a critical tool for teachers and school leaders.

In addition, the Boston Plan for Excellence/Boston Teacher Residency (BPE/BTR), the local education fund and teacher residency working in partnership with the Boston Public Schools (BPS), will act as a replication site beginning in Year 4; their use of the model will inform their nationally renowned teacher preparation and development program, and will contribute to New Visions' learning regarding inquiry's impact on novice teacher development.

National Advisory Committee. We have assembled a distinguished National Advisory Committee to critically review the instructional strategies and inquiry processes that teachers are using in the project. The advisory committee will meet in four times per year, twice virtually and twice in person, to engage with the New Visions and SVMI implementation and support teams as well as teacher, students and school leaders in the A(2)I schools. We will also call on them informally to provide insight and support around particular issues as we work to implement the project. The advisory represents educators in a variety of institutional contexts across the US, and each member shares deep expertise in and a commitment to centering instruction on student thinking and developing equitable, high-level mathematics teaching practices.

Magdalene Lampert will serve as Senior Advisor to the project, visiting the schools on a quarterly basis to work with the inquiry teams and conduct observations of instructional interventions stemming from the inquiry work. She will provide teachers, the New Visions and SVMI core teams, and the advisory committee with updates on the project's progress in relation to her ongoing research on ambitious instruction in mathematics.

Validation Feedback and Dissemination. Rockman et al. will provide timely, ongoing feedback to New Visions and other key stakeholders in monthly check-in calls and quarterly memos. REA

will submit an annual report in Years 1-4, and a final comprehensive report in Year 5, which shares findings with particular attention to taking the project to scale. In this report, they will synthesize the evidence on program implementation and impact into an empirical model of A(2)I's theory of change. This model will link implementation to outcomes and describe how the program is working, for whom and under what conditions. It will provide item-level templates for comparing student performance on Regents exams, and validated observation protocols and surveys to gather meaningful implementation and attitudinal data. The video captured as part of the evaluation will become part of a virtual library and training tool to show how inquiry-based curriculum and collaborative teacher inquiry work in concert to improve math instruction and achievement.

Estimated cost per student per year. Over the five years proposed here, the program will impact a total of:

| Year | Students Impacted | Details |
|---------------|---|---|
| Year 1 | Approximately 1200 students in Algebra I TOTAL: 1200 students | 10 schools (2 New Visions Charter Schools, 8 New Visions PSO schools) |
| Year 2 | Original 10 schools (Cohort 1): 1200 students in Algebra I, additional 1200 students in Geometry New 10 schools (Cohort 2): 1200 students in Algebra I TOTAL: 5100 students | Original 10 schools plus 10 additional schools (2 charter, 8 PSO) Targeted City Assistance (access to resources through the Knowledge Management library) to 3 networks |
| Year 3 | Cohort 1: 1200 students in Algebra I, additional 1200 students in Geometry, additional 600 in Algebra II Cohort 2: 1200 students in Algebra I, additional 1200 students in Geometry Cohort 3: 1200 students in Algebra I TOTAL: 13,100 | 20 Cohort 1 and 2 schools plus 10 additional schools (2 charter, 8 PSO) Targeted City Assistance to 3 networks plus an additional 5 networks State Assistance to 5 networks |
| Year 4 | Cohort 1: 1200 students in Algebra I, 1200 students in Geometry, 600 in Algebra II Cohort 2: 1200 students in Algebra I, 1200 students in | 30 Cohort 1-3 schools 8 City Networks plus an additional 5 |

| | | |
|---------------|---|--|
| | Geometry, additional 600 in Algebra II Cohort 3: 1200 students in Algebra I, additional 600 in Geometry BPE/BTR: 500 students in Algebra I TOTAL: 16,500 | 5 State Networks plus an additional 5 5 BPE/BTR schools in Boston |
| Year 5 | Cohort 1: 1200 students in Algebra I, 1200 students in Geometry, 600 in Algebra II Cohort 2: 1200 students in Algebra I, 1200 students in Geometry, 600 in Algebra II Cohort 3: 1200 students in Algebra I, 1200 students in Geometry, 600 in Algebra II BPE/BTR Cohort 1: 500 students in Algebra I, 250 in Geometry BPE/BTR Cohort 2: 500 in Algebra I TOTAL: 26,750 | 30 Cohort 1-3 schools 13 City Networks plus an additional 5 10 State Networks plus an additional 5 10 BPE/BTR schools |

The total number of students involved over the course of the grant period is 62,650.

The total budget for this proposal is \$13,000,000.

The per student rate comes out to \$207 per student. At scale, the costs would be as follows:

100,000 students: \$20,700,000

250,000 students: \$517500000

500,000 students: \$103500000

G. SUSTAINABILITY

New Visions' ability to operate, sustain and scale the A(2)I project beyond the length of the grant is based on a set of key factors. First, New Visions and its partners have the financial resources to continue its operations and expand beyond the time of the validation grant.

Funding has been traditionally drawn from a rich array of public sector investments, state and federal funding. Most notably, New Visions recently received an \$8 million grant from the Gates Foundation to support its development of Inquiry based strategies to implement the

common core standards in literacy and math. Over the last decade, we have received nearly \$130 million from private philanthropy to support our work.

New Visions has an annual operating budget of approximately \$20 million and a staff of 80, for the past decade funded in large part through national foundations, individual contributions and fee-for-service payments from NYC public schools for support from its partnership support organization division. Key to the organization's mission is a commitment to improving the New York City school system as a whole. Board members include Roger Altman (Evercore), Richard Beattie (Simpson, Thacher and Bartlett), Randi Weingarten (American Federation of Teachers), Michael Mulgrew (United Federation of Teachers), Sue Lehmann (Teach for America, Harlem Children's Zone), Caroline Kennedy (NYC Fund for Public Schools), Gary Ginsberg (Time Warner) and other high-profile business and non-profit executives and educators. Recently, board members and other private supporters have encouraged New Visions to pursue scale-up strategies, as they have seen impact of its work in other districts, such as Boston and Oakland. This organizational foundation and commitment to scaling strategies is exceptional and serves to ensure the success of the initiative at scale and beyond the terms of the grant.

New Visions leadership work closely with New York City Chancellor Dennis Walcott and State Commissioner John King to inform district and state policy and initiatives. Other New Visions leaders involved in this project have ongoing partnerships with key Department of Education administrators to support the dissemination of our resources, materials and strategies. Our partnership support organization staff works directly with principals and teachers in 76 schools. As an official project partner, the New York City Department of Education has committed to serve as a key adviser to the A(2)I project, and will work closely with project partners to ensure alignment with citywide priorities and initiatives. In addition, the DOE will support dissemination of A(2)I products to all New York City schools as the project goes to scale and will facilitate access to data as needed for project evaluation. The A(2)I project has also secured the support of the United Federation of Teachers, whose president serves on the New Visions board, and the American Federation of Teachers [see attached letters of support].

But New Visions also has a long history of building widespread coalitions and securing government participation in projects to support education reform across the Country. As an operator of district and charter schools, we are a unique bridge between these frequently siloed communities and regularly participate in forums because of our unique East-meets-West perspective. We are a regular participant in forums organized by the New School Venture Fund, Public Education Network, the Annenberg Institute for School Reform, the Gates Foundation, the Carnegie Corporation of New York, the Aspen Institute and many others. These vital, ongoing relationships gives New Visions multiple entry points to ensure the A(2)I project priorities are adopted by a wide array of stakeholders in public education.

Incorporation into ongoing work

New Visions, SVMI and its partners are committed to the success of A(2)I project, viewing the partnership as critical to the organizational goals of each. For New Visions, it is working closely to ensure that all New York City public school students receive the educational resources

necessary to ensure that are on track for high school graduation and post-secondary success. We believe that success in Algebra I and II are critical to this goal. To accomplish this goal, New Visions works directly with 74 schools, serving 37,000 students. This is a particularly critical time New Visions has recently announced plans to implement an 18-school charter network, with nine secondary schools in high-need neighborhoods focused on mathematics and science instruction. A(2)I promises to provide key supports to the charter network that will be closely watched and replicated in the next ten years.

H. STAFFING AND MANAGEMENT PLAN

[please note: full Management Plan is included in the Appendix]

A(2)I Roles

The responsibility for completing the projects and tasks below will be taken by a variety of teams comprised of key staff members from New Visions and SVMI.

New Visions Instructional Specialist (IS) – In each A(2)I school, the IS (one per each five schools, for a total of six over the course of the grant) will lead the instructional work of the math department, focusing on student learning and achievement and coordinating the improvement of instruction through the use of the SVMI assessments in Algebra I, Geometry and Algebra II, and the MDC formative assessment lessons in Algebra I and Geometry. The IS will have deep expertise in coaching teachers on curricular implementation, determining interventions through formative assessments, and developing instructional strategies in response. S/he will work intensely with math teams for one week in the summer, two hours each week during the school year, and additional hours during the delivery of SVMI assessments; the IS will also work with the A(2)I Knowledge Management Officer to develop the A(2)I Resource Library.

New Visions Director of Instruction – The NV Director of Instruction will be working in collaboration with SVMI staff and New Visions ISs and LDFs to facilitate the overall A(2)I project, providing supervision and support around the appropriate level of coaching in support of SVMI assessment delivery and MDC lesson selection, the curricular and instructional supports needed for those teachers working in the A(2)I schools, and the delivery of ongoing training and professional development. She will also act as a liaison between New Visions and the schools in each year of partnership.

New Visions Leadership Development Facilitators (LDFs) – The LDFs, one per every five A(2)I schools, will work with principals and math department teams to ensure that the conditions are in place for teacher teams to use student data from the SVMI assessments and the MDC lessons to inform an ongoing cycle of inquiry. In partnership with the principals at each school, the LDFs will drive the adoption of the A(2)I work as a common language throughout the school so that it forms the basis for whole-school reform efforts, including the use of teacher evaluation rubrics incorporating the use of FAIs and inquiry as a measure of effectiveness. LDFs will co-facilitate the A(2)I process with principals and a team of faculty members, building the capacity of teachers at the school to ground all instructional decisions firmly in the needs of students, and to sustain an intense focus on instruction over time; they also will share learnings and methods from the project across their existing networks, creating the first stage of dissemination throughout the city.

SVMI Facilitators – The SVMI Facilitators, three for each year of the grant, will lead the intensive professional development workshop each summer and the quarterly sessions during the year, providing training on the delivery and scoring of MARS assessments and the use of the scoring process to inform decisions regarding instruction. They will work closely with the ISs to ensure that the assessment data is being optimized in each school, and with LDFs to build knowledge and skills in assessment use across both schools and the New Visions PSO networks.

New Visions Knowledge Management Officer and Dissemination Officer – Two new staff positions, the A(2)I Knowledge Management Officer will oversee the videotaping and documentation of the inquiry process and the FAL delivery, creating an easily accessible A(2)I Resource Library and dissemination mechanism through New Visions' KnowledgeBase system; the Dissemination Officer will support its rollout throughout the district and the state through the network teams to support A(2)I replication and scaling efforts at the City, State and national levels. They will also work with the National Advisory Committee in the documentation of their research on the project.

New Visions A(2)I Project Coordinator – This new staff position will work to align A(2)I's school-based supports with New Visions' existing programs across its charter and PSO schools, to ensure that the math initiatives at each A(2)I school are integrated into both the schools' vision for academic success, and New Visions' college and career readiness work. S/he will also coordinate the quarterly SVMI professional development sessions in partnership with the SVMI program coordinator, and the quarterly Advisory Committee meetings.

A(2)I Senior Advisor – The A(2)I Senior Advisor, Magdalene Lampert, will provide ongoing guidance throughout the grant period, collaborating with the A(2)I team to ensure high-quality implementation of the FALs and inquiry methods based on her work in and research on ambitious mathematics instruction; she will also work with New Visions and BPE/BTR in the out years of the grant to develop a teacher preparation model centering around mathematical inquiry. She will oversee the Advisory Committee in partnership with the SVMI Executive Director and New Visions' Director of Instruction.

Assessment Specialist – A new role to support the implementation of the SVMI assessments and work with teachers to implement the FALs based on student responses to them, the Assessment Specialist will work closely with the LDFs and ISs across the grant period.

BPE/BTR – New Visions will contract with the Boston Plan for Excellence/Boston Teacher Residency (BPE/BTR) in Years 4 and 5 of the grant to act as an initial replication site for A(2)I implementation. They also will provide technical assistance around the issue of inquiry-focused teacher preparation and novice teacher development in mathematics. This will consist of onsite coaching from key BPE/BTR staff, site visits to BPE/BTR's training academy, and documentation of the A(2)I work in this area.

Workplan and Goals:

1. Create school conditions conducive to collaborative inquiry
2. Increase students' math learning and achievement in high need secondary schools
3. Translate Common Core Standards into practice
4. Increase teachers' pedagogical content knowledge and instructional effectiveness

5. Ensure that effective use of inquiry and formative assessments becomes part of the school wide instructional culture
6. Develop a Dissemination and Knowledge Management Center to support the development and implementation of Common Core-aligned formative assessment lessons in conjunction with Inquiry work

| | |
|---------------------------------------|--|
| Phase 1 work at participating schools | Summer Institute: Select and implement Algebra 1 FALs |
| | Participate in Train-the Trainer sessions for MDC work |
| | Implement FALs on ninth grade level |
| | Use SMVI diagnostics on ninth grade level |
| | Implement Cycles of Inquiry |
| | Share work within school/across departments |
| | Begin integration of work into formal teacher observation and evaluation systems of the school |
| Phase 2 work at participating schools | Continue Phase 1 work |
| | Expand work by including additional grade level and incorporating Geometry FALS |
| Phase 3 work at participating schools | Continue Phase 1 and 2 work |
| | Expand work by including available Algebra II/Trigonometry FALS |
| | Complete integration of work into formal teacher observation and evaluation work |

During the planning period (1/2 year: January 2012 – June 2012), New Visions will:

- a. Conduct information and outreach sessions with school representatives in order to identify and recruit 10 cohort 1 schools for Year 1 implementation
- b. Recruit and hire 2 Instructional Specialists who will join and work with our current Math Instructional Specialist to refine the project plan
- c. Recruit and hire the Assessment Specialist who will join the instructional team; build their capacity to develop effective assessment problems as well as their capacity to assess student understanding through the study of the work students produce
- d. Develop an MOU with SMVI for work with and use of their assessment materials during project implementation
- e. Plan resource library development
- f. Plan for documentation/dissemination
- g. Refine the design of the evaluation study
- h. Convene the Advisory Committee

During the first year of implementation (July 2012 – June 2013),

- a. Cohort 1 schools complete Phase 1 work
- b. New Visions will:
 - recruit 2 additional Instructional Specialists for work with Cohort 2 schools
 - begin collection and curation process for resource library, including the tagging of videotaped lessons and inquiry team meetings
 - gather observational notes for documentation process

- convene the Advisory Committee

During the second year of implementation (July 2013 – June 2014):

- a. Cohort 1 schools do Phase 1 and phase 2 work
- b. Cohort 2 schools do Phase 1 work
- c. New Visions will:
 - recruit 2 additional Instructional Specialists for work with Cohort 3 schools
 - continue collection and curation process for resource library, including the tagging of videotaped lessons and inquiry team meetings
 - release a documentation report
 - continue to gather observational notes for documentation process
 - convene the Advisory Committee
 - provide materials and technical assistance to NYC networks

During the third year of implementation, (July 2014 – June 2015):

- c. Cohort 1 schools do Phase 1, Phase 2 and Phase 3 work
- d. Cohort 2 schools do Phase 1 and Phase 2 work
- e. Cohort 3 schools do Phase 1 work
- d. New Visions will:
 - continue collection and curation process for resource library, including the tagging of videotaped lessons and inquiry team meetings
 - release a documentation report
 - continue to gather observational notes for documentation process
 - convene the Advisory Committee
 - provide materials and technical assistance to NYC networks
 - provide materials and technical assistance to NYS networks

During the fourth year of implementation, (July 2015 –June 2016):

- f. Cohort 1 schools do Phase 1, Phase 2 and Phase 3 work
- g. Cohort 2 schools do Phase 1, Phase 2 and Phase 3 work
- h. Cohort 3 schools do Phase 1 and Phase 2 work
- e. New Visions will:
 - continue collection and curation process for resource library, including the tagging of videotaped lessons and inquiry team meetings
 - release a documentation report
 - continue to gather observational notes for documentation process
 - convene the Advisory Committee
 - provide materials and technical assistance to NYC networks
 - provide materials and technical assistance to NYS networks

Key New Visions staff on this project include:

Robert L. Hughes

President

Robert L. Hughes was appointed president of New Visions in September 2000. Under his

leadership, New Visions has created 96 public schools in New York City, provided mentoring services to 633 new principals, developed school-based certification programs for teachers and principals, and created an inquiry process now in use in 1,500 New York City public schools.

Hughes, an attorney, has worked on public education issues for his entire career. He served as co-counsel in the *Campaign for Fiscal Equity v. The State of New York*, challenging the constitutionality of the New York State's educational finance system. Plaintiffs prevailed and secured a \$5 billion remedial decree for operating aid and a \$13.5 billion decree for capital construction for the New York City public school system.

Hughes received his undergraduate degree from Dartmouth College and his law degree from Stanford Law School. He clerked for the Hon. Shirley Abrahamson, chief justice of the Wisconsin Supreme Court. He has authored articles on public education for *The New York Times*, the Association of the Bar of the City of New York, the *Yale Law & Policy Review*, and the *Connecticut Law Review*. He served as chair of the Committee on Education and the Law at the Association of the Bar of City of New York and chair of the board for Advocates for Children of New York, where he was previously deputy director.

Ronald Chaluisan***Vice President, Charter Schools***

Ronald Chaluisan joined New Visions in 2002. He currently heads the Charter School unit which will open two schools in September 2011. Previously he served as the vice president of Programs where he led the development, implementation and assessment of programs in new school development, teaching and learning, and leadership development. As director of small schools, he oversaw the New Century High Schools Initiative, a comprehensive school-creation process, and designed a wide range of supports for existing small schools throughout New York City. He was the co-founder and principal of the New York City Museum School, a New Visions small-school collaboration among Community School District 2 and the American Museum of Natural History, Brooklyn Museum of Art, Children's Museum of Manhattan and the South Street Seaport Museum. He holds a B.A. from Harvard University and a Master's in educational leadership from Bank Street College of Education.

Beverly Donohue***Vice President, Policy and Research***

Beverly Donohue joined New Visions in 2003. She leads the Policy and Research Department in formulating and advocating policies to support the improvement of public education in New York City, including the systemic reform of secondary education. Donohue brings extensive experience from New York City government, where she held positions as chief financial officer for the New York City public school system and deputy director of the New York City Office of Management and Budget. She is a nationally recognized expert on school budgets and funding in support of educational reform. Donohue holds a B.A. from Radcliffe College and a M.Ed. from Harvard University.

Chad Vignola

Vice President, Partnership Support Organization

Chad Vignola joined New Visions in 2007. He currently heads the Partnership Support Organization, which provides instructional and operational support to schools covered by New Visions' Partnership Support Organization (PSO) contract. Vignola's PSO work has included both organizational knowledge management and the Model Staffing Initiative, a partnership between New Visions and The New Teacher Project. Vignola was previously the chief operating officer for New Leaders for New Schools; prior to that he was vice president of K-12 Services at Princeton Review. He has served as general counsel and executive director for six central office departments in the New York City Department of Education under three Chancellors. He holds a J.D. from the University of Pennsylvania Law School and has completed coursework toward his Ed.D. at New York University.

Bob Hiller***Instructional Specialist, New Visions***

Bob Hiller has joined the Charter team in 2011 to develop a math curriculum and lesson plans aligned with the Common Core standards for both charter and PSO schools. He previously provided educational consulting services at Evans Newton Inc. and has taught at Thomas Edison High School in Alexandria, VA, Bronx Lighthouse Charter School and South Side High School in Rockville Centre, NY. Bob holds a B.S. in Mathematics (Honors) and an M.A. in Elementary Education from Adelphi University. He is currently pursuing his M.S. in Math Leadership from Bank Street College of Education.

| Goals | Year 1/2 - Planning January 2012 -- June 2012 | Year 1 - implementation July 2012 -- August 2012 | Year 2 - implementation September 2012 -- June 2013 | Year 2 - implementation July 2013 -- August 2013 | Year 3 - implementation September 2013 -- June 2014 |
|---|--|--|---|--|---|
| | Recruitment of 2 Math Instructional Specialists | | Recruitment of 2 additional Math Instructional Specialists | | Recruitment of 2 additional Math Instructional Specialists |
| | Recruitment of Assessment Specialist | | | | |
| | SVMI and NV create MOU for A(2)1 schools | | | | |
| Create school conditions conducive to collaborative inquiry | Selection of Cohort 1 A(2)1 schools | Cohort 1 schools begin program work | Select Cohort 2 schools | Cohort 2 schools begin program work | Select Cohort 3 schools |
| | | Summer train the trainer sessions focused on the implementation of MDC FALS | | Summer train the trainer sessions focused on the implementation of MDC FALS | |
| | | LDF works with Instructional Specialist and Cohort 1 teams to learn formal inquiry protocols and plan for the implementation of regular cycles of inquiry during the upcoming year | LDF and Instructional Specialists meet with Cohort 1 teams regularly to analyze observations of lessons, study student work and make adjustments to the implementation of the FALS | LDF works with Instructional Specialist and Cohort 2 teams to learn formal inquiry protocols and plan for the implementation of regular cycles of inquiry during the upcoming year | LDF and Instructional Specialists meet with Cohort 1 and 2 teams regularly to analyze observations of lessons, study student work and make adjustments to the implementation of the FALS |
| | | | LDF works with school leadership to understand the impact of the work, to help develop the effective coaching of this work into the leadership's observation cycles, to incorporate the information gathered through observation into the comprehensive teacher evaluation plan and to spread the work as appropriate | | LDF works with school leadership to understand the impact of the work, to help develop the effective coaching of this work into the leadership's observation cycles, to incorporate the information gathered through observation into the comprehensive teacher evaluation plan and to spread the work as appropriate |

| Year 3 - implementation July 2014 -- August 2014 | September 2014 -- June 2015 | Year 4 - implementation July 2015 -- August 2015 | September 2015 -- June 2016 | Objectives |
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| Cohort 3 schools begin program work | | | | |
| Summer train the trainer sessions focused on the implementation of MDC FALS | | Summer train the trainer sessions focused on the implementation of MDC FALS | | |
| LDF works with Instructional Specialist and Cohort 3 teams to learn formal inquiry protocols and plan for the implementation of regular cycles of inquiry during the upcoming year | LDF and Instructional Specialists meet with Cohort 1, 2 and 3 teams regularly to analyze observations of lessons, study student work and make adjustments to the implementation of the FALS | | LDF and Instructional Specialists meet with Cohort 1, 2 and 3 teams regularly to analyze observations of lessons, study student work and make adjustments to the implementation of the FALS | |
| | LDF works with school leadership to understand the impact of the work, to help develop the effective coaching of this work into the leadership's observation cycles, to incorporate the information gathered through observation into the comprehensive teacher evaluation plan and to spread the work as appropriate | | LDF works with school leadership to understand the impact of the work, to help develop the effective coaching of this work into the leadership's observation cycles, to incorporate the information gathered through observation into the comprehensive teacher evaluation plan and to spread the work as appropriate | All principals in the A(2)1 schools will incorporate the effective use of inquiry and use of FALS as an integral part of the rubric for mathematics teacher evaluation. |

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| Increase students' math learning and achievement in high need secondary schools; Translate Common Core Standards into practice; Increase teachers' pedagogical content knowledge and instructional effectiveness | | Summer Institute for Cohort 1 schools - selection of FALS for upcomin year | With weekly support from the Instructional Specialists, Cohort 1 schools plan, implement and study the impact of the first set of FALS (Algebra); use select SMVI assesments/ diagnostics | Summer Institute for Cohort 1 and Cohort 2 schools - selection of FALS for upcomin year | With weekly support from the Instructional Specialists, Cohort 1 schools use 1st set of FALs with new freshmen; use select SMVI assessments/ diagnostics; plan, implement and study the impact of the second set of FALs (Geometry) |
| | | | | | With weekly support from the Instructional Specialists, Cohort 2 schools plan, implement and study the impact of the first set of FALS (Algebra); use select SMVI assesments/ diagnostics |
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| Ensure that effective use of inquiry and formative assessments becomes part of the schoolwide instructional culture | | | | | Math teams share their work and the assessed impact on student learning at regularly scheduled quarterly full staff meetings |
| | | | Monthly math focused study meetings to present program work and engage non-participating PSO and charter schools in understanding the potential and impact of the work | | Monthly math focused study meetings to present program work and engage non-participating PSO and charter schools in understanding the potential and impact of the work |

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| Summer Institute for Cohort 1, Cohort 2 and Cohort 3 schools - selection of FALS for upcomin year | With weekly support from the Instructional Specialists, Cohort 1 schools use 1st set of FALS with new freshmen; use select SMVI assessments/ diagnostics;use the second set of FALS (Geometry) with new sophomores; plan, implement and study the impact of available 3rd level FALS | Summer Institute for Cohort 1, Cohort 2 and Cohort 3 schools - selection of FALS for upcomin year | With weekly support from the Instructional Specialists, Cohort 1 schools use 1st set of FALS with new freshmen; use select SMVI assessments/ diagnostics;use the second set of FALS (Geometry) with new sophomores; use available 3rd level FALS with new juniors | We will work with a total of 30 NYC public and charter schools to implement the A(2)1 work over five years (see rollout schedule in Section H), reaching 1/3rd of our PSO network and all of our charter schools by year 3 |
| | With weekly support from the Instructional Specialists,Cohort 2 schools use the first set of FALS (Algebra); with new freshment; use select SMVI assessemnets/ diagnostics; plan, implement and study the impact of the second set of FALS (Geometry) | | With weekly support from the Instructional Specialists, Cohort 2 schools use the first set of FALS (Algebra); with new freshment; use select SMVI assessemnets/ diagnostics; use the second set of FALS (Geometry) with new sophomores | 80% of students taught through this method will pass the Algebra 1 Regents exam with at least a 65%; 50% of students taught through this method will pursue higher level mathematics learning; 80% of those pursuig higher level math will pass the Algebra II/trigonometry Regents with at least a 65%. |
| | With weekly support from the Instructional Specialists, Cohort 3 schools plan, implement and study the impact of the first set of FALS (Algebra); use select SMVI assessemnets/ diagnostics | | With weekly support from the Instructional Specialists, Cohort 3 schools plan, implement and study the impact of the first set of FALS (Algebra); use select SMVI assessemnets/ diagnostics | |
| | Math teams share their work and the assessed impact on student learning at regularly scheduled quarterly full staff meetings | | Math teams share their work and the assessed impact on student learning at regularly scheduled quarterly full staff meetings | 90% of the schools involved in this initiative will translate their learning regarding the use of formative assessments and inquiry into their work in other departments |
| | Monthly math focused study meetings to present program work and engage non-participating PSO and charter schools in understanding the potential and impact of the work | | Monthly math focused study meetings to present program work and engage non-participating PSO and charter schools in understanding the potential and impact of the work | |

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| Develop a Dissemination and Knowledge Management Center to support the development and implementation of Common Core-aligned formative assessment lessons in conjunction with Inquiry work | Planning for resource library development | | | Documentation report 1 release | |
| | Planning for documentation / dissemination plan | Videotaping of selected FAL sessions across participating schools | | Videotaping of selected FAL sessions across participating schools | |
| | | | Identification of 3 NYC networks for invitation to access materials and technical assistance | | |
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| | Evaluation design in progress | Preliminary data collection for evaluation | | | Evaluation report 1 release |
| | 1st Advisory Committee convening | | 2nd and 3rd Advisory Committee Convening | | 3rd and 4th Advisory Committee Convening |

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| Documentation report 2 release | | Documentation report 3 release | | Lessons implemented through this initiative, as well as videotaped inquiry sessions, teacher survey results, and evidence of changes in the student learning and teacher practice, will be housed in a Dissemination and Knowledge Management Center made public in Year 2 and beyond |
| | Videotaping of selected FAL sessions across participating schools | | Videotaping of selected FAL sessions across participating schools | |
| Identification of an additional 5 NYC networks for invitation to access materials and technical assistance | | Identification of an additional 5 NYC networks for invitation to access materials and technical assistance | | |
| Identification of 5 NYS networks for invitation to access materials and technical assistance | | Identification of an additional 5 NYS networks for invitation to access materials and technical assistance | | |
| | Evaluation report 2 release | | Evaluation report 3 release | |
| | 5th and 6th Advisory Committee Convening | | 7th and 8th Advisory Committee convening | |