

CALL FOR PROPOSALS

Massachusetts STEM Pipeline Fund

@Scale Project Initiative

Request for Proposals 2012



**Massachusetts Department of Higher Education
One Ashburton Place, Room 1401
Boston, Massachusetts 02108**

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I. Introduction

[Massachusetts' STEM Plan](#), released at the 2010 state STEM Summit, provides the Commonwealth with a roadmap to student success based upon five quantitative and four qualitative goals including measurable objectives projected annually through 2016. In this first year of implementation we have chosen to focus on three of these five goals – student interest, student academic achievement and student readiness for post-secondary STEM programs.

Massachusetts is regarded by other states as a leader in STEM education based, in part, on its consistently high ranking on the National Assessment of Education Progress (NAEP) in 4th and 8th grade mathematics and science, its first place ranking on the mathematics section of the SAT in 2010 and also because it was one of the first states to release a comprehensive statewide STEM plan. Yet even with these indicators of success, serious challenges continue to exist. For example, Asian and White students score proficient or higher in both mathematics and science at nearly double the rate of African American and Latino students, in virtually every grade tested.¹ On the Science, Technology and Engineering MCAS examination, just 13% of African American and 13% of Latino students are achieving proficiency compared to 54% of Asian and 47% of White students. These data speak to an unacceptable and persistent achievement gap.

Despite their successes, many students experience what Secretary of Education, S. Paul Reville, refers to as an “inspiration gap.” An indication of this can be found in student survey data reported from the College Board’s SAT in which students self-report their **interest** in studying STEM majors in college. Data from the 2010 SAT exams show that only 36.8% of Massachusetts high school students express an interest in pursuing STEM at the post-secondary level, below the national average of 43%.

On this same survey, students indicate their **readiness** to pursue post-secondary STEM majors based on projected completion of the MassCore curriculum recommendations of four years of mathematics and three years of laboratory science.² Taken together, these two indicators – interest and readiness – reflect the level of student inspiration to pursue STEM careers and student’s commitment to achieve the level of academic proficiency necessary to succeed in post-secondary STEM programs of study.

To address this inspiration gap and affect widespread gains in student interest and student readiness, the Governor’s STEM Advisory Council (STEM Council) recently launched the “@Scale” initiative. This initiative established criteria to identify projects that engage, excite and prepare students for STEM programs of study, have a demonstrated history of success in achieving targeted student outcomes and possess the characteristics necessary to support broad-based replication and/or scale-up. An initial six such projects were endorsed by the STEM Council. These projects were challenged to secure school district partners who have substantial numbers of students who are interested but only nearly-prepared or prepared but only nearly-interested³ in STEM and to propose implementation projects that will benefit the greatest number of students, quickly.

Through this Request For Proposal (RFP), the Massachusetts Department of Higher Education, which leads the STEM initiative and administers the STEM Pipeline Fund, will select and provide public matching funds for up to 9 (total) implementation projects which:

¹ Per 2010 Massachusetts Comprehensive Assessment Exams (MCAS)

² The requirement for 4 years of mathematics as the minimum entry criteria for students in Massachusetts Public Higher Education institutions was approved for implementation in 2016 by the Board of Higher Education on March 22, 2011.

³ The STEM Council defined “*near prepared*” students as those students who need no more than one year of additional coursework (in mathematics and/or science) to fulfill the MassCore STEM recommendations. It defined “*near interested*” as those students who, according to the SAT questionnaire on choice of college major, do NOT choose a STEM field as their first choice for a post-secondary major but do select a STEM major as one of five secondary choices.

- Meet the criteria defined for endorsement by the STEM Council in the @Scale initiative⁴,
- Include school partners⁵ selected on the basis of student need defined as “near interested” and “near prepared” and committed to carry-out and support the implementation project
- Identify private sector funding partners providing matching funds with a target of 1:3 public to private.

II. Purpose

Massachusetts benefits from an abundance of STEM projects and programs. Many of these reflect local school or community priorities while others are based on national initiatives and funding sources. While these projects create value for individual students, teachers and school districts, too often they are not designed nor implemented with the intention of affecting transformative, system-wide change nor are they funded over sufficient time to enable sustainable outcomes.

The @Scale initiative, supported by this RFP, provides a framework to select and fund projects that:

- Identify and quantify, through data, STEM education challenges that are central to achieving the goals of Massachusetts’ STEM plan
- Are grounded in research, designed for replication and scale-up, and have demonstrated success in achieving student outcomes related to these challenges
- Promote partnerships with school districts that service significant numbers of students who demonstrate the characteristics of “near-interested/near prepared”
- Have confirmed commitments of time and resources from partner school districts to ensure the success and sustainability of transformative projects
- Secure matching private sector funds for implementation projects to achieve transformative and sustainable improvements in student outcomes.

The Department of Higher Education, in coordination with the STEM Council, is pleased to release this RFP to advance the @Scale Initiative.

III. Need

The dual focus of the @Scale initiative on “*near interested*” and “*near prepared*” students arises from analysis of data reported from the College Board SAT questionnaire and the Massachusetts Comprehensive Assessment System (MCAS) exam. A review of 2010 data from these sources revealed a pool of students who appeared to be fully prepared but only “near interested” in STEM college majors and careers or fully interested but only “near prepared”. These data indicate that there were approximately 1,700 students considered in the “near interested” group and 1,700 students considered in the “near prepared” group. (See figure 1). For the purpose of this grant, we accept these data as a proxy for current and near future student need.

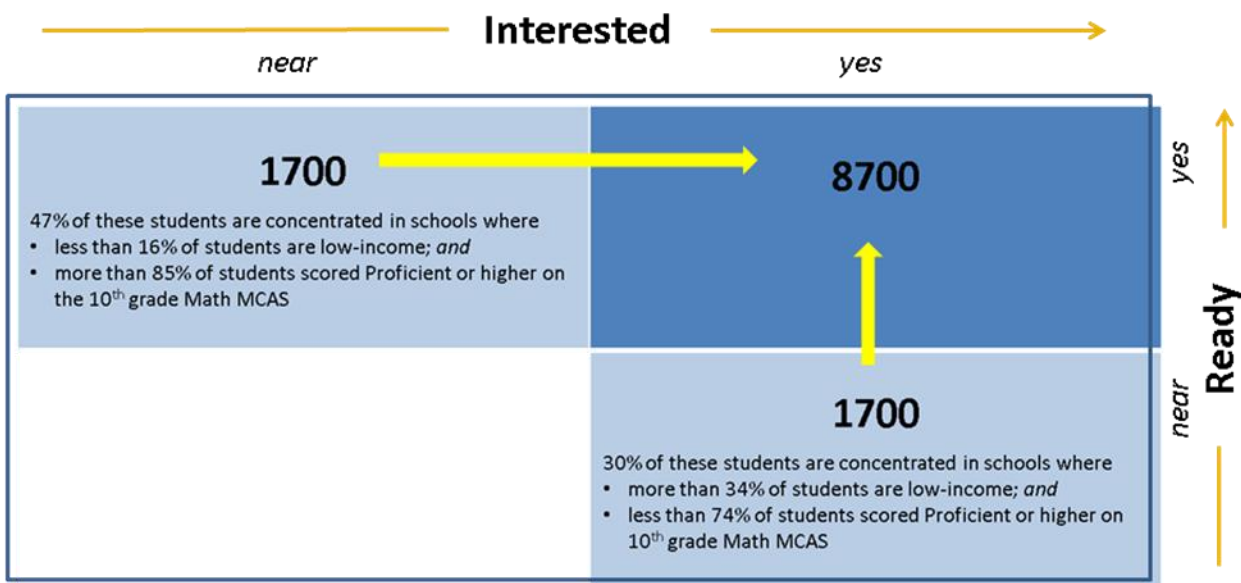
⁴ See Appendices A & B the original application documents for @Scale endorsement. The application process occurred in two phases over the spring and summer of 2011.

⁵ See Appendix C for a list of “opportunity schools”. These are the schools with higher concentrations of ‘near interested/near prepared’ students. This list is not all inclusive; it should be used as a guide and not as a defining authority.

Through targeted interventions designed to improve student preparation and/or to provide additional exposure to career possibilities, the potential exists to advance over 3,400 students (a 39% increase) into the “pipeline” of students who are both interested and prepared to pursue STEM college majors.

We define “near prepared” students as those students who need no more than one year of additional coursework (in mathematics and/or science) to fulfill the MassCore STEM recommendations. Under the MassCore recommendations, a student must complete a minimum of 4 years of mathematics courses and 3 years of a laboratory science to attend a 4-year public college. Those students who complete all the recommended courses are considered prepared.

“Near interested” are those students who, according to the SAT questionnaire on choice of college major, do NOT choose a STEM field as their first choice for a post-secondary major but do select a STEM major as one of five secondary choices.⁶



2010 Data, UMass Donahue Institute

Figure 1

⁶ For further information/definitions regarding the “near interested/near prepared” gap and on the original @Scale application process in general, refer to the prior @Scale FAQ – Appendix D.

IV. Awards

The STEM Pipeline Fund commits \$400,000 to support as many as 9 implementation projects at an anticipated funding level of \$40,000 to \$50,000 per project. These funds will require a match of private funds targeted at a ratio of 1:3 (public:private).

- A. Projects selected as candidates to receive grants from the STEM Pipeline fund will be announced April 1, 2012.
 1. Projects that have secured private sector matching funds at the targeted ratio of 1:3 will receive the disbursement of STEM Pipeline Funds within three weeks.
 2. Projects that have not secured private sector matching funds at the targeted ratio of 1:3 will have until June 30, 2012 to do so.
 3. Projects that do not secure private sector matching funds at the targeted ratio of 1:3 by June 30, 2012 will be deferred for possible future funding consideration.
- B. DHE may have the opportunity to increase the funding available through the @Scale initiative. If additional funds were to become available during the grant duration period, DHE reserves the right to increase the maximum obligation to some or all grants executed as a result of this RFP.
- C. Funds will be disbursed on a schedule consistent to the needs of the project beginning as early as April 2012 up until June 30, 2012. Final disbursement will be released no later than June 30, 2013 for projects scheduled for implementation between April 1, 2012 and June 30, 2014.
 1. Initial disbursement will be based on the scope and requirements of the project
 2. Subsequent disbursements, if required, will be contingent upon demonstrated progress to achieve project objectives through twice yearly status reports detailing:
 - i. Implementation of stated goals and objectives;
 - ii. Adherence to budgetary and evaluation protocols, and
 - iii. Compliance with all information requests.

V. Eligibility

A. General Program Attributes:

- Projects must address the goals defined in the Massachusetts STEM Plan⁷ specifically the goals of Student Interest and Student Readiness and must address the gaps of “near interested/near prepared” students.
- Projects must describe and document the commitment of school districts to successful implementation and future sustainability.
- Projects must be grounded in research and have a demonstrable history of achieving positive student outcomes documented through independent evaluations.

B. Scalability

- Projects must demonstrate the ability to expand the delivery model beyond the original site.
- Project must be designed and packaged for ease of implementation at an adopting site.

⁷ The state STEM Plan titled, “A Foundation for the Future: Massachusetts’ Plan for Excellence in STEM Education”, is posted on DHE’s STEM Pipeline Fund website found here: <http://www.mass.edu/forinstitutions/prek16/pipeline.asp>.

C. Funding

Projects will only receive STEM Pipeline grant funds on the basis of committed matching private sector (business, foundations etc.) funding on a target ratio of 1:3 (public:private).

VI. Proposal Requirements

Note: *Projects previously endorsed for @Scale by the STEM Council need only respond to sections A and B1-7 below. New projects must respond to sections A and B1-14.*

- A. Project Abstract (one page). Include the following:
 - 1. Name of project
 - 2. Type of project (e.g. Student Interest)
 - 3. Target Population Served (i.e. grade level)
 - 4. Key Personnel
- B. Narrative (not to exceed 8 pages, with standard 1" margins, single or double spaced and 10 to 12 pt. font) that includes the following elements:
 - 1. The project objective and goals.
 - 2. The characteristics of the partner school(s) and district, specifically related to the number of "near-interested and near-prepared" students in the partner schools to be served
 - 3. The proposed timeline and phased implementation (if relevant) of the project. (When will the project begin, when will students first be engaged and how many students? If there will be subsequent phases of student engagement, describe the timing of those phases.)
 - 4. For what purposes will the requested funding be used (e.g. equipment or educational resources, teacher professional development, stipends...)
 - 5. The expected outcomes and how they will be measured
 - 6. Description of private matching commitments and disclosure of any existing gap to achieve the 1:3 ratio
 - 7. Plan for long-term scalability
 - i. Describe any relationship of the PreK-16 Regional STEM Network⁸ in support of the implementation of this project, if any. Plan for sustainability of the project after the funding period expires

The following must be addressed by proposals for projects not previously endorsed for @Scale by the Governor's STEM Advisory Council

- 8. The critical gaps the project addresses. As identified earlier, the critical gaps this RFP seeks to close are the following:
 - i. students interested in STEM fields but only nearly prepared
 - ii. students prepared for STEM fields but only nearly interested

⁸ To learn more about the PreK-16 Regional STEM Networks or to locate your Network's contact information, check out the DHE STEM Pipeline Fund website at: <http://www.mass.edu/forinstitutions/prek16/pipelinenetworks.asp>.

9. A description of already measured outcomes including:
 - i. Numbers served directly (e.g. project participants) by the project(s);
 - ii. Pre- and post-test result changes; and
 - iii. Other relevant evidence of success
10. An explanation of the *quantitative* goal(s) (see Appendix E) the project aligns with, describing specifically how your project addresses that goal(s) and the process by which you measure the impact of your project against that goal(s)
11. An explanation of the *qualitative* goal(s) (see Appendix F) the project aligns with, describing specifically how your project addresses that goal(s) and the process by which you measure the achievement of your project against that goal(s)
12. A description of the ways in which your project links to any other key attributes of the Massachusetts' STEM Plan
13. Examples of successful project expansion/replication to demonstrate your project has the ability to expand the delivery model beyond the original site and sustain continuity of the project outcomes over time. Include details such as:
 - i. length of time your project has been in place
 - ii. number of expansion sites and type of expansion (e.g. classroom -> classroom, school -> school, etc.)
 - iii. number of project cycles conducted at each site (start/ end date),
 - iv. number of educators and/or student impacted
 - v. cost per student/teacher
 - vi. hurdles and lessons learned
14. Explain the resources available to the adopting site such as:
 - i. implementation guides or documented procedures
 - ii. supplies (e.g. books, lab equipment, etc.), and
 - iii. consultants, instructors, trainers etc
15. Evidence that the program has caused changes in practice at its present site

VII. Budget Information

- A. Proposed Budget. Fill out the attached Form 1. (Located after the appendices and attached as a Word.Doc.)
- B. Budget Narrative. Provide an explanatory narrative that supports each line of your detailed budget request (Form 1). In your narrative include the following:
 1. A description of the funding model that would be necessary to support and sustain your project over time.

VIII. Evaluation & Reporting

Project proposals will demonstrate a strong commitment to formative evaluation and will include plans to continue ongoing evaluation protocols extended to the proposed implementation projects. Grant funds may be requested to support ongoing project evaluations but should not exceed 5% of the grant total.

The DHE is engaged with statewide evaluation consultants on the development of a common STEM evaluation toolkit it plans to deploy by the fall of 2012. In accepting an award, projects agree to participate in any new evaluation protocols (contingent upon additional funding) needed to support the evaluation work.

Mid-year and year-end status reports will be due according to the table below. All reports will be based on a template to be provided by the DHE and will include the following elements:

- Narrative of project implementation,
- Evaluation report of the program/project’s effectiveness using quantifiable research methods and demonstrating results from pre- and post tests,
- Final Expense Report (budget)
- Participant data, including:
 - Numbers served with all student subgroup breakouts;
 - Grade levels represented;
 - Reasons for participation.

Project Reporting Deadlines		
Mid-Year Progress Report	December 30, 2012	December 30, 2013*
Year-End Progress Report	June 30, 2013	June 30, 2014*

*If necessary

IX. Submission Instructions

In order to be considered for selection, we must receive your *complete* proposal no later than **4:00 pm Friday, March 16, 2012**. Proposals will be accepted between Feb 29th and March 16th. We will not consider any proposals received after March 16th.

Please submit your completed proposal via email to:

Keith Connors, Program Manager of the STEM Pipeline Fund
Massachusetts Department of Higher Education

Submission Email: STEMProjectforScale@bhe.mass.edu

Representatives of the Operations Board of the Governor’s STEM Advisory Council will review the proposals and will score them based on a common scoring process and rubric. Up to 9 proposals will be recommended to the Governor’s STEM Advisory Council for award approvals. The total STEM Pipeline funds available for match with private sector funds are \$400,000. The maximum available funding pool is anticipated to be \$1.6M based upon achievement of a full 1:3 public:private match.

RFP Timeline	
<i>Request for Proposals</i> Release Date	February 2, 2012
Proposals Due	Feb 29, 2012 - March 16, 2012
Grant Candidates Selected	April 1 2012
Award Announcements	April 1, 2012 - June 30, 2012

X. Policies

A. Grant Disbursement

Following the applicant's acceptance of the award letter, and the execution of the Standard Contract, or the Interagency Service Agreement, and any other required documents, the applicant can expect to receive disbursements on a schedule consistent to the needs of the project. After initial disbursement, progress-based disbursements will be dependent upon submission and acceptance of mid-year, end-of-year or interim progress reports, including:

- Progress towards meeting stated goals and objectives including enrollment projections;
- Alignment with State STEM Plan goals and linkage to Regional STEM Networks;
- Sound fiscal management; and
- Quality and timeliness of reporting requirements.

B. Publicity

Grant recipients are obligated to acknowledge the funding source in all print materials, websites and press releases. The acknowledgement of the funding source contributes to the overall name recognition and branding of the STEM Pipeline Fund. The following, consistent wording should be used:

Short form: ***"The [insert project name] is funded through the Massachusetts' Department of Higher Education's STEM Pipeline Fund."***

Long form: (Use short form plus one or more sentences of the following): ***"The STEM Pipeline Fund was established through the Economic Stimulus legislation. The STEM Pipeline Fund seeks to improve teacher preparation in science, technology, engineering, and mathematics (STEM) subjects and to increase student interest in, preparation for, and success in STEM careers."***

C. Solicitor Responsibility

Solicitors may not alter (manually or electronically) the grant application language or any grant application component files. Modifications to the body of the grant application, specifications, terms and conditions, or application which change the intent of this grant application are prohibited and may disqualify a response.

All costs associated with responding to this RFP are the sole responsibility of the responding organization. The DHE reserves the right to use any and all ideas included in any response without incurring any obligations to the responding firm or committing to awards for the proposed services. Responses become the property of the DHE.

D. Legal Disclaimer

This RFP does not represent a contractual agreement by the DHE to any applying organization. Selected organizations will enter into a contractual agreement with the DHE upon award.

THE DEPARTMENT OF HIGHER EDUCATION RESERVES THE RIGHT TO REJECT ANY AND ALL RESPONSES AND THE RIGHT TO CANCEL THIS REQUEST FOR QUALIFIED PROPOSALS (RFP) AT ANY TIME PRIOR TO AWARD.

Appendix A Phase 1: Application for @Scale Endorsement

Project Information

Please tell us about yourself and give us a brief abstract of your project.

Name of Project _____

Type of Project (e.g., Professional Development) _____

Project Manager:

Name _____

Affiliation _____

Email _____

Telephone _____

PreK-16 Regional STEM Network affiliation (check one): Boston Berkshire Central
 Metro West Northeast Pioneer Valley Southeastern

Description of Project:

Please answer all questions on the following pages. Please limit your responses to a total of five (5) pages.

Criteria I

Goals

Projects considered for @Scale endorsement must address **areas of need** as determined by the STEM Operations Board, in the context of the **quantitative and qualitative goals** identified in the Massachusetts STEM Plan.

Ph1 G1) The STEM Operations Board has identified two critical gaps which must be addressed by projects submitted for @Scale endorsement. Which of those gaps does your project address?

_____ Students interested in STEM fields, but only nearly prepared

_____ Students prepared for STEM fields, but only secondarily-interested

Please describe how your project addresses these gaps.

Ph1 G2) The Massachusetts STEM Plan lists five **quantitative goals**:

- I. Increase *student interest* in STEM
- II. Increase STEM *achievement* among PreK-12 students
- III. Increase the percentage of students who demonstrate *readiness for college-level study* in STEM fields
- IV. Increase the number of students who *graduate from a post-secondary institution* with a degree in a STEM field
- V. Increase the number/percentage of PreK-16 STEM *classes led by effective educators*.

- a. In addition to the needs addressed by your response to question G1, does your project also address quantitative goals II, IV, or V? If so, which one(s)?
- b. For each of the goals identified in Question G2a, describe specifically what quantitative impact your project had on the goal, and how you measure that impact.

Ph1 G3) *The following four **qualitative goals** drive the Theory of Action of the Massachusetts STEM Plan:*

- I. Diverse Students and Future STEM Professionals
- II. Community Engagement
- III. Academic Coherence
- IV. Educator Development

- a. Which qualitative goal(s) does your project address?
- b. For each of the goals identified in Question G3a, describe specifically how your project addresses those qualitative goal(s).

Ph1 G4) Please tell us about the process by which you measure the achievement of your project against these quantitative and qualitative goals.

- a. Describe the existing evaluation process and methods which validate your project’s quantitative achievement of those goals.

Ph1 G5) Describe ways in which your project links to *any other key attributes* of the [Massachusetts STEM Plan](#).

Criteria II Scalability

*We want to understand the extent to which your project exhibits certain characteristics, which accepted research shows to be an indicator for **successful scale-up**.*

Ph1 S1) *Successful scale-up projects should demonstrate the ability to expand the delivery model beyond the original site and sustain continuity of project outcomes over time.*

Please provide examples of successful project expansion/replication, such as:

- a. Length of time your project has been in place;
- b. Number of sites expanded to;
- c. Number of project cycles conducted at each site (start date – end date);
- d. Number of educators impacted, if applicable;
- e. Number of students impacted ;
- f. Briefly describe your experience with the scaling process: hurdles, lessons learned, etc.

Ph1 S2) *Please tell us about the funding model of your project.*

- a. Describe how your project was initially funded.

- b. If your project was initially funded from external sources,
 - i. Was the funding process competitive?
 - ii. Have the original funding partners provided subsequent rounds of funding?
 - iii. Have additional or new funding partners supported the project?
- c. Describe the funding model that would be necessary to support and sustain your project through scale-up.

Ph1 S3) *Please identify the program(s) you have partnered with, if your project is the result of either*

- a collaborative effort with programs of a similar nature (e.g., part of a consortium?); or
- a clustering of similar programs (e.g., science fairs).

Ph1 S4) *Project reviewers will give strong consideration to projects that demonstrate readiness to scale.*

- a. Is an “implementation guide” available for the adopting site? Please provide a link or a .pdf file.
- b. Identify the organizational structure and all site-based resources (leadership, teachers, etc.) necessary to implement your project at the adopting site.
- c. Identify any infrastructure requirements (e.g., technology) necessary to implement the project at the adopting site.
- d. Identify the skills and knowledge necessary to implement your project at the adopting site, and the process by which those skills and knowledge will be transferred to the adopting site.
- e. What support is your organization prepared to provide to adopting sites in order to successfully scale the project?
- f. Explain how your organization
 - i. will have the capacity and capability to support adopters;
 - ii. is prepared to act as consultant to the leadership of the adopting site (e.g., train the trainer).
- g. If you will rely on 3rd party organizations to implement your project at adopting sites (e.g., educator PD program), please identify the organizations. Please tell us about your relationship with them.

Appendix B Phase 2: Application for @Scale Endorsement

Criteria I

Goals

Projects considered for @Scale endorsement must address **areas of need** as determined by the STEM Operations Board, in the context of the **quantitative and qualitative goals** identified in the Massachusetts STEM Plan.

Ph1 G6) The following four **qualitative goals** drive the Theory of Action of the Massachusetts STEM Plan:

- V. Diverse Students and Future STEM Professionals
- VI. Community Engagement
- VII. Academic Coherence
- VIII. Educator Development

Please describe the systemic changes, in the context of these qualitative goals, that will occur over time as a result of the scale-up of your project.

Ph1 G7) The Massachusetts STEM Plan lists five **quantitative goals**:

- I. Increase *student interest* in STEM
- II. Increase STEM *achievement* among PreK-12 students
- III. Increase the percentage of students who demonstrate *readiness for college-level study* in STEM fields
- IV. Increase the number of students who *graduate from a post-secondary institution* with a degree in a STEM field
- V. Increase the number/percentage of PreK-16 STEM *classes led by effective educators*.

Please tell us about the process by which you measure the achievement of your project against the quantitative and qualitative goals of the Massachusetts STEM Plan.

- b. What are the essential and complete set of evaluation questions that measure the success of your project in meeting the quantitative goals? Please attach any instruments (questionnaires, surveys, protocols, etc.) you used to answer these questions, or cite the reference for any commercial or proprietary instrument you used.
- c. Summarize the conclusions drawn from any data already collected, relevant to the goals of the STEM plan.

*We want to understand the extent to which your project and theory of action exhibit certain characteristics, which accepted research shows to be an indicator for **successful scale-up**.*

Ph2 S1) Please cite the educational research upon which your project is based.

Ph2 S2) *Please tell us a little about the project at its initial site.*

- a. Explain how your project has caused intended changes in practice at your site.
- b. Over what period of time have these changes been sustained?
- c. Describe the level of support the project received from the leadership at the initial site.

Ph2 S3) *The number of educators / students who benefit from the scale-up of your project, as well as the cost of achieving the impact of this scale-up, will be important factors for application reviewers to consider. Your past experience will inform our understanding of these factors.*

- a. Please describe the level of scaling your project has experienced since its inception. (e.g., classroom -> classroom; school -> district; district-> district)
- b. Over what period of time did that scale-up occur?
- c. Identify the total cost of the scale-up. Tell us what items of cost are included in that estimate.
- d. How many educators directly benefited from the scale-up of your project?
- e. How many students directly benefited from the scale-up of your project?
- f. Characterize the total cost per student, or total cost per educator, of the scale-up of your project.

Appendix C

Examples of Opportunity Schools

The schools on this list are examples of ones that have populations that could benefit from programming which addresses improving STEM college readiness (specifically, increasing the number of students who complete 4 years of math and 3 years of science) or increasing interest in STEM college majors (specifically, inspiring/motivating students, who have a casual or secondary interest in STEM as a career or college major, to make STEM their 1st choice). In general, lower-income and/or lower performing schools will have populations that will benefit more from preparation-oriented interventions while higher-income and/or higher performing schools will have populations that will benefit more from interest-oriented interventions.

Berkshire:

Pittsfield High School
Taconic High School
Monument Mt Regional High School
Wahconah Regional High School
Northern Berkshire RVTs
Drury High School
Mount Greylock Regional High School
Hoosac Valley High School

Boston:

East Boston High School
Brighton High School
Boston Latin School
Madison Park High School
Charlestown High School
Boston Latin Academy
The English High School
O'Bryant School of Math & Science
Jeremiah E. Burke High School
Media Communications Tech HS
The Engineering School
Boston Arts Academy

Central:

Wachusett Regional High School
Montachusett Regional VTHS
Bay Path Regional VTHS
Leominster Senior High School
Shrewsbury High School
Blackstone Valley Regional VTHS
Fitchburg High School
Shepherd Hill Regional High School
North Middlesex Regional HS
Quabbin Regional High School
Nashoba Regional High School
Westborough High School
Tantasqua Regional High School
Auburn High School
Leominster Center for Tech Ed
Nipmuc Regional High School
Northbridge High School

Oakmont Regional High School
Oxford High School
Gardner High School

MetroWest:

Waltham High School
Franklin High School
Newton North High School
Lexington High School
Acton-Boxborough Regional High School
Newton South High School
Marlborough High School
Algonquin Regional High School
Natick High School
Concord-Carlisle High School
Lincoln-Sudbury Regional High School
Milford High School
Tri County Regional VTHS
Walpole High School
Assabet Valley Regional VTHS
Norwood High School
Wellesley High School
Needham High School
Hudson High School
Hopkinton High School

Northeast:

Lowell High School
Greater Lowell Regional VTHS
Peabody Veterans Memorial HS
Methuen High School
Haverhill High School
Lynn English High School
Shawsheen Valley Regional VTHS
Chelmsford High School
Greater Lawrence Regional VTHS
Beverly High School
Billerica Memorial High School
Whittier Regional VTHS
Andover High School
Westford Academy
Gloucester High School

Classical High School
North Andover High School
Tewksbury Memorial High School
Masconomet Regional High School
Dracut Senior High School
Salem High School
Lynn Vocational Technical Institute
Danvers High School
Reading Memorial High School
Burlington High School

Pioneer Valley:

Springfield Central High School
Chicopee Comprehensive High School
Westfield High School
Putnam VTHS
West Springfield High School
Chicopee High School
Holyoke High School
Agawam High School
Amherst Regional High School
Minnechaug Regional High School
High School of Science & Technology
Ludlow Senior High School
Northampton High School
High School of Commerce
Longmeadow High School
Pathfinder Regional VTS
East Longmeadow High School
South Hadley High School
Franklin County RVTHS
Southwick-Tolland Regional High School

Southeast:

Brockton High School
B. M. C. Durfee High School
Weymouth High School
New Bedford High School
Greater New Bedford Regional VTHS
Taunton High School
Attleboro High School
Bridgewater-Raynham Regional HS
Greater Fall River Regional VTHS
Barnstable High School
Plymouth South High School
Southeastern Regional VTHS
Mansfield High School
Dartmouth High School
Whitman-Hanson Regional High School
Bristol-Plymouth Regional VTHS
King Philip Regional High School
Quincy High School
North Quincy High School
Silver Lake Regional High School
Braintree High School
Dighton-Rehoboth Regional High School
Marshfield High School
North Attleboro High School
Stoughton High School
Dennis-Yarmouth Regional High School
Falmouth High School
Pembroke High School
Plymouth North High School
Sandwich High School

Appendix D @Scale Endorsements – FAQ

Reference Only! [This FAQ was in response to the 2011 @Scale application cycle.]

1) What is the purpose of the @Scale Endorsement?

- I. To target gaps based on the goals defined in Massachusetts STEM plan and quantified through rigorous data analysis.
 - The target gaps will be reevaluated for each cycle of @Scale endorsements. Projects that do not address the current gaps will have opportunities for consideration in subsequent cycles.
- II. To identify scale-ready projects that have a demonstrated history of results in addressing and closing the targeted gaps AND incorporate the essential characteristics for successful scale-up.
- III. To build a portfolio of projects, over time, for consideration by funding and implementation partners as initiatives that, through replication and or scale-up, can benefit the greatest number of students and close critical opportunity, achievement, and inspiration gaps, quickly.

2) What is the nature of @Scale Endorsements?

We anticipate that there will be a clear separation between projects that have previously demonstrated the characteristics for scale-up from projects that have not. We expect to provide feedback to projects about specific characteristics that need to be strengthened. This will inform and improve the caliber of all @Scale projects over time.

3) What do you mean by “Nearly Prepared” Students?

The MassCORE STEM program of study recommends 4 years of mathematics and 3 years of lab science coursework.

Prepared = students who fulfill the MassCORE STEM recommendations.

Nearly Prepared = students who need no more than one year of additional coursework (in math and/or science) to fulfill the MassCORE STEM recommendations.

Data Source: SAT Registration Questionnaire responses by test-takers from Massachusetts public schools.

4) What do you mean by “Near Interested” Students?

Interested = student’s first choice for a career or college major is a STEM field.

Near Interested = student’s first choice for a career or college major is NOT a STEM field, but they do express a general interest in STEM fields

Many STEM-prepared students are generally interested in STEM fields, but are not committing to them for a career or college major. Students who do not start a STEM college major track during freshman year often have difficulty transferring into a STEM major. As a result, students should be encouraged to “start STEM first” – that is, make a STEM field their first choice in order to not miss out on an opportunity for which they are prepared.

Data Source: SAT Registration Questionnaire responses by test-takers from Massachusetts public schools.

5) What comes next after @Scale Endorsement?

The portfolio of projects that receive @Scale Endorsements will be listed on the STEM Pipeline website. We anticipate that potential funding partners will seek more detailed information about these projects and may solicit comprehensive proposals for specific scale-up initiatives. As is always the case, project leaders will be expected to directly engage funding and implementation partners (Schools and School Districts, Teachers, non-profit community organizations, Higher Education institutions, others) to establish a coalition necessary for successful implementation.

6) Where can I find a copy of the Massachusetts STEM Plan?

A. Version 1.0 of The Massachusetts STEM Plan can be found here on the official state website.

7) What time will the @Scale endorsements be announced on June 23?

A: The Governor's STEM Advisory Council meeting is scheduled for 2:30-4:00. The @Scale endorsements will be announced during that meeting.

8) Please describe in more detail what you mean by “the funding model that would be necessary to support and sustain your project through scale-up”?

A: We are interested in understanding if in your project would leverage existing overhead and indirect expenses and only require funding for direct expenses related to serving more schools, teachers or students, or whether the project would require funding to cover incremental indirect and overhead expenses as well as direct expenses.

9) If I manage a large program consisting of a number of projects and activities which address a set of goals broader than the ones identified for this round of endorsement, should I apply for endorsement of my entire program or should I apply for endorsement only for those activities?

A. While a project may provide a broad range of features and activities we will limit our endorsement consideration to ensuring that projects clearly addresses the goals identified as the focus for this round of @Scale endorsement. Additional features of a project will not be a consideration of this endorsement process.

Projects that can be replicated or scaled-up will be the focus of this endorsement, not activities within a project.

10) If two activities within a single project address the goals of this first round call for applications, should I submit a single application or two separate applications?

A. The endorsement will apply to complete projects that can be replicated or scaled-up. Only one application should be submitted for a project.

11) Does the phrase “key attribute” in Question Ph1 G5 refer to any specific part of the Plan?

A. No. Please focus your proposal on addressing how the project addresses the goals defined for this round of endorsement.

12) How should I format my responses to the application questions? Should I embed my responses within the application, or should I make reference to a question number and respond on a separate form?

A. We recommend that you do not embed your responses within the online document. Instead, we recommend you create a separate document for your responses and reference the question number.

13) Does the 5-page limit for the application include the space taken up by the questions themselves? How do we make sure to capture the salient points in only 5 pages when, typically, applications require much longer responses?

A. No, the 5-page limit does not include restated questions. (See answer to #12 above.) This application is intended to provide the STEM Advisory Council with sufficient information to consider a project for @Scale endorsement.

- 14) In order for my project to be eligible, must it address only current high school juniors and seniors (e.g. high school programs)? If I can make the case that my program addresses the stated goals of this round, but targets younger students, can I still apply for endorsement?**
- A. We are seeking to identify projects that address the stated goals, impacting the greatest number of students in the near term. The timeline to affect outcomes related to the goals will be a consideration for the @Scale endorsement process.
- 15) How does the January 2011 online project survey, administered jointly by the Department of Higher Education and the UMass Donahue Institute, relate to this @Scale endorsement process?**
- A. The online project survey served a different purpose. There is no direct connection of the January 2011 survey to the @Scale endorsement process.
- 16) Are you focusing only on projects that have actually scaled to some degree in the past, or is it sufficient for a project to demonstrate the capacity to scale?**
- A. A demonstrated history of successful replication or scale-up is not a prerequisite for consideration for an @Scale endorsement. Projects must at a minimum address a readiness for replication or scale-up.
- 17) What is the role of the Regional STEM Networks in this process?**
- A. The Regional STEM Networks are not involved in the selection of projects for endorsement. However, the Regional STEM Networks play several important roles such as the liaison to the STEM Advisory Council and the Operations Board, and as an important resource for coordinating the scaling of projects from region to region or statewide. Through this process the Regional Networks will be more fully informed of projects in their region.
- 18) How will the regional STEM networks be notified of projects submitted from their geography?**
- A. Per the online instructions, applicants are asked to inform their affiliated Regional STEM Network of their submitted application. Names and contact information of the regional STEM network managers are located on the DHE STEM Pipeline Fund website. The web address is: <http://www.mass.edu/forinstitutions/prek16/pipelinenetworks.asp>.
- 19) Must projects collaborate with a Regional Network to be eligible for an @Scale endorsement?**
- A. No, but we encourage all project managers to engage their Regional STEM Network. Again, contact information can be found on the DHE STEM Pipeline Fund website. (See answer 18 above.)
- 20) What magnitude of scaling are you looking for? Are you looking only for projects with broad scaling potential or will projects with narrower scaling experience or potential (i.e. school to school) be eligible for endorsement?**
- A. We are seeking to identify projects that address the stated goals and can impact the greatest number of students in the near term. The potential of a project to impact significant numbers of students will be a consideration for the endorsement process. We also recognize the value of projects that can be replicated or scaled-up to address student needs in less densely populated areas and will take this into consideration as well in the endorsement process.
- 21) Will the STEM Advisory Council provide funding in association with a project's @Scale endorsement?**
- A. No, there is currently no source of funding associated with the @Scale endorsement process. Projects seeking financial support for replication or scale-up should pursue traditional funding channels.

22) Does “scale-up” mean exact replication, or can it allow for modification to my program at the adopting site?

- A. A demonstrated history of successful replication or scale-up will be a consideration of this endorsement process. While prior scale-up is not a prerequisite for consideration, projects must at a minimum address a readiness for replication or scale-up.

Any specific implementation requirements for the replication or scale-up of a project are beyond the scope of the @Scale endorsement process.

23) Is this application the equivalent of an executive summary of a more formal RFP? Will you be asking for more detail later in this process?

- A. This application is a two-phase process. Only those projects that meet the defined goals and the @Scale criteria will be invited to apply to Phase 2 of this endorsement process and will at that time be asked to provide more detail.

24) Will you publicize the projects invited to complete Phase 2 of the application?

- A. Yes. We will announce those projects on the website and we will notify the affiliated Regional STEM Network.

25) Who do we contact if we have additional questions?

- A. All questions should be sent to: STEMProjectforScale@bhe.mass.edu. We will acknowledge your question and we will post both your question and our answer on the FAQ sheet located on the website.

26) Will there be subsequent opportunities to apply for a project @Scale endorsement? Will future cycles of this process address the same or different goals in the future?

- A. We do anticipate that there will be future opportunities for projects to apply for a project @Scale endorsement although a timetable for subsequent rounds has not been set.

Future cycles of this process may address the same goals or new goals as determined by the STEM Advisory Council.

27) What are your plans for future information sessions, and would you consider conducting a webinar?

- A. Any future information sessions will be announced on the STEM Pipeline Fund website and also communicated to the regional STEM network managers. We will look at the feasibility of hosting future information sessions as webinars.

28) Must projects focus broadly on STEM or can a project focus on a particular discipline, such as math or science?

- A. We set no restriction on a project's STEM focus. The focus can be broad or narrow. The more important consideration is that the project addresses one or both of the critical goals identified in the application documents.

29) Do you plan to weigh different components of the application when considering endorsement?

- A. The intent of the @Scale endorsement is to identify projects that address the identified goals and scaling criteria for project endorsement. We anticipate that projects will have a broad range of scale characteristics and the endorsement process will take that into consideration

30) Will the project feedback be made public?

- A. Written feedback will be provided to each project leader. We anticipate that what we learn from this process that can be provided as generalized feedback to all projects will be posted on the STEM website.

31) Do we have a target number of projects you plan to endorse?

A. No, any project that meets the eligibility criteria is a candidate for endorsement.

32) Must collaboration partners and potential implementation funders be identified in the application?

A. No.

33) Can a collaboration of projects apply as a single entity or must each project apply individually?

A. This process will consider clearly identified projects that can be replicated or scaled and can demonstrate a history of success with prior replication and scale-up. A collaboration of projects could combine to develop and present a new project for @Scale endorsement consideration.

34) Must a project already be in existence and demonstrated some level of success to be considered for endorsement?

A. Prior history of a projects success in addressing the defined goals and replication or scale-up will be primary considerations for endorsement.

35) Of the five quantitative goals listed on Page 2 of the application, four relate to students, and the fifth relates to teachers. Are the projects intended to deal with students or teachers?

A. This initial cycle of @Scale endorsements addresses two quantifiable gaps which relate directly to student achievement and interest in STEM subjects. Future cycles of @Scale endorsements will address other goals described in the Massachusetts STEM Plan, prioritized by the STEM Advisory Council

36) My project spans multiple regions. Do I need to notify all affiliated Regional STEM Networks or can I just notify one?

A. You can notify just one Regional STEM Network but we would encourage you to notify all the regions where your project has a presence.

37) Are non-profit organizations eligible to submit projects for @Scale endorsement consideration?

A. Any organization that believes it has a project that meets the eligibility criteria can submit an application.

Reference Only

Appendix E

State STEM Plan Quantitative Goals

- 1) Increase student interest in STEM.
- 2) Increase STEM achievement among PreK-12 students.
- 3) Increase the percentage of students who demonstrate readiness for college-level study in STEM fields.
- 4) Increase the number of students who graduate from a post-secondary institution with a degree in a STEM field.
- 5) Increase the number/percentage of STEM classes led by effective educators, from PreK-16.

Goal 1: Increase student interest in STEM.

Standard: Increase interest in STEM college majors among college-going MA public school graduates to 35% by 2016 (from 25% in 2009).

- Increase interest among the underrepresented gender in fields with a gender-based gap in interest.
- Increase interest among underrepresented races/ethnicities in fields with a race/ethnicity-based gap in interest.
- Increase interest in fields where there are anticipated gaps in future employment (from industry growth and/or from retirement of current employees).
- Increase interest in STEM fields at early ages (including preschool and elementary school) to assist in increasing student motivation to attain higher levels of STEM academic achievement/performance.

Goal 2: Increase STEM achievement among PreK-12 students.

Standard: Increase the percentage of all students scoring *Proficient* or *Advanced* on the MCAS mathematics and science & technology/engineering assessments:

- Increase the percentage of all 5th and 8th grade students scoring *Proficient* or *Advanced* on mathematics and science & technology/engineering MCAS assessments by 20 percentage points by 2016.
- Increase the percentage of all high school students scoring *Proficient* or *Advanced* on mathematics and science & technology/engineering MCAS assessments by 10 percentage points by 2016.
- Reduce the achievement gaps of 5th grade, 8th grade, and high school students on the mathematics and science & technology/engineering MCAS assessments by 25% between 2010 and 2014, and another 25% between 2014 and 2016.

Goal 3: Increase the percentage of students who demonstrate readiness for college-level study in STEM fields.

Standard: Increase the percentage of MA public high school students who report taking at least 4 years of math (from 69% in 2009 [SAT]) and 3 years of lab-based science (from 79% in 2009 [SAT]) to 100% in 2016,¹ consistent with MassCORE, as well as increase the percentage of MA public high school students who report taking advanced mathematics (pre-calculus and above) to 55% (from 44% in 2009 [SAT]) by 2016.

- Increase STEM course-taking among the underrepresented gender in courses with a gender-based gap in participation.
- Increase STEM course-taking among underrepresented races/ethnicities in courses with a race/ethnicity-based gap in participation.

Goal 4: Increase the number of students who graduate from a post-secondary institution with a degree in a STEM field.

Standard: Increase the number of students who complete STEM post-secondary degrees at MA public and private institutions by 50% from 2008 to 2016.

- Increase the number of Bachelor's degrees granted in all STEM majors to all students by 50% by 2016.
- Increase the number of Bachelor's degrees granted in all STEM majors to the underrepresented gender in majors with a gender-based gap in degrees.
- Increase the number of Bachelor's degrees granted in all STEM majors to the underrepresented gender in majors with a gender-based gap in degrees.

Goal 5: Increase the number/percentage of STEM classes led by effective educators, from PreK-16.

Standard: TBD

- Future measure of STEM qualifications of Pre-K-16 educators (TBD; likely will vary by level: elementary, secondary, post-secondary)
- Future measure of STEM effectiveness of Pre-K-16 educators (TBD; likely will vary by level: elementary, secondary, post-secondary)

Appendix F

State STEM Plan Qualitative Goals

The intent of the following qualitative goals is to provide a context for the scope of the change and the increased capacity required to achieve the intended whole-system transformation.

a. Community Engagement

Every Massachusetts community will foster increased student interest in STEM through programming and spreading awareness. To spark and sustain student awareness of, interest in and motivation to pursue advanced STEM education and related careers...

- In every community parents, educators, employers, student leaders and STEM professionals will be informed and enlisted as advocates to influence, support and sustain student commitment to STEM from Pre-K through post-secondary education.
- PreK-16 students will have access to rigorous academic and technical preparation in the STEM subjects and be encouraged to engage in experiential and applied learning opportunities.
- Collaboration is critical. Effective collaboration can enhance existing opportunities and bolster the development of systems at the community level to engage students at various points along the STEM pipeline – from preschool to career.

b. Academic Coherence

Massachusetts STEM standards, curriculum frameworks, instruction and assessments will...

- Incorporate a balanced focus on deep content knowledge, mathematical and scientific inquiry and problem solving/design, reflecting post-secondary faculty expectations for college and career readiness and employer expectations for STEM careers.
- Align vertically across grade levels and horizontally across subject strands to ensure coherent subject progressions among schools, across districts and through college.
- Connect community-based experiential and project-focused learning resources to PreK-12 curricula and/or through collaborative use of STEM related laboratories in the vocational technical schools.

c. Educator Development

Every student will learn from highly effective educators in every STEM subject area at every grade level, PreK-16. Massachusetts educators will...

- Possess deep subject matter knowledge that spans grade levels; be skilled in the pedagogy of inquiry and problem solving; and be prepared to incorporate experiential and applied learning that integrates science, technology, engineering and mathematics into coherent classroom instruction.
- Make effective use of technology as a tool for learning, recognizing its application as an essential resource for every 21st century STEM profession.

- Seek out innovative ways to further improve their understanding of their student's strengths and weaknesses, through data analysis and the creation of active assessments.

d. STEM Employers and STEM Professionals

Employers and the community of STEM professionals (from industry and education) can provide an array of opportunities for experiential learning, both inside and outside the classroom by...

- Participating in educator professional development and communicating their expectations for students wishing to pursue a career in their sector. Employers and STEM professionals will serve as mentors, internship/co-op supervisors, leaders of community-based after-school and expanded learning time programs and partner with schools to offer new programming and expand existing programming such as the already state approved STEM programs in vocational technical schools.
- Sponsoring university laboratory research and industry-based teacher externships. They will also serve as collaborative partners in high quality professional development and pre-service programs.

Form 1

Template – Proposed Budget

Please complete the table below with a breakdown of the requested funding from this @Scale initiative with funds from the DHE STEM Pipeline Fund and from private matching funds (please specify sources). Upon completion of the table, please provide an additional *Budget Narrative* that includes specific details of each budget item in the table.

Instructions: Double-Click on the table for it to become an interactive spreadsheet. Click outside the table to return to MS Word. ONLY FILL IN CELLS HIGHLIGHTED IN YELLOW: Non-Yellow cells contain formulas and will fill in automatically. Also, all cells are formatted for currency; you do not need to type in \$ signs.

@Scale Project: _____ Project Manager: _____

Categories	Total Grant Funds Requested
Total Salaries:	\$ -
<i>Administrator</i>	
<i>Support Staff</i>	
<i>Other</i>	
Fringe Benefits	
Travel	
Contractual Services	
Total Supplies & Materials	\$ -
<i>Curriculum</i>	
<i>Equipment</i>	
<i>Other</i>	
Transportation	
Training	
Tuition & Stipends	
Other	
Evaluation	
Indirect Costs (10% Max)	
Total	\$ -
Plus Private Matching Funds	
Grand Total	\$ -

Calculate Unit Cost/Student and enter here: \$ _____

Calculate Unit Cost/Teacher and enter here: \$ _____