Massachusetts STEM Pipeline Fund

@Scale Project Initiative

Request for Proposals
For

Math and Science Achievement

Issued by:

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

I. Introduction ........................................................................................................................................... 3

II. Purpose ................................................................................................................................................. 4

III. Need .................................................................................................................................................... 5
    A. Student Achievement ....................................................................................................................... 5
    B. Student Interest ................................................................................................................................. 10
    C. Interest and Achievement ............................................................................................................... 11

IV. Proposal Requirements ..................................................................................................................... 12

V. Budget Information ............................................................................................................................ 13

VI. Evaluation & Reporting ..................................................................................................................... 13

VII. Eligibility ........................................................................................................................................... 14
    A. General Program Attributes: ........................................................................................................ 14
    B. Scalability ....................................................................................................................................... 14
    C. Funding: .......................................................................................................................................... 15

VIII. Submission Instructions .................................................................................................................. 15

IX. Implementation Timeline .................................................................................................................. 16

X. Awards ................................................................................................................................................ 16

XI. X. Policies ......................................................................................................................................... 16
    A. Grant Disbursement ........................................................................................................................ 16
    B. Publicity ......................................................................................................................................... 17
    C. Solicitor Responsibility ................................................................................................................. 17
    D. Legal Disclaimer ............................................................................................................................. 17

XII. Form 1 Template – Proposed Budget ............................................................................................. 18
I. Introduction

Massachusetts’ STEM Plan, released at the 2010 state STEM Summit, provides the Commonwealth with a roadmap for student success based upon six quantitative and four qualitative goals with progress objectives projected annually through 2016.

While Massachusetts is blessed with many innovative STEM projects that complement classroom learning and provides students with opportunities to engage in STEM experiential activities in after-school and out-of-school settings, educators and funders alike have called for the identification a more limited number of “best practice” projects that can be replicated or scaled-up in every region of the commonwealth.

In response, the Governor’s STEM Advisory Council (STEM Council) launched the @Scale initiative to identify projects that (1) demonstrate a history of successful performance in context of the STEM plan goals, (2) reflect contemporary STEM educational research principles and practices through their design, and (3) are designed for replication and scale-up, improving outcomes for large numbers of students, quickly. Since the initial implementation of the @Scale initiative we have recognized the further opportunity to align these projects as a portfolio that will span grade levels as well as the disciplines of science, mathematics, and technology/engineering. Through this portfolio approach we expect to better integrate project practices and promote academic coherence to cascade and construct student learning in STEM, pre-K to college.

Initially, seven projects that addressed Student Interest (goal #1) and Student Readiness for Post-secondary STEM Programs (goal #3), targeting high school and middle school students, were endorsed by the STEM Council. Subsequently, these projects completed a competitive review of their proposed replication/scale-up projects (including a requirement for matching non-state funds) and were awarded grants through the STEM Pipeline. This is known as the Phase I cohort of @Scale projects.

In 2012, a second cohort of five projects that addressed Workforce Development (goal #6) and Post-secondary Graduation Rates (goal #4) were selected and endorsed by the STEM Council. These projects were also awarded matching grants through the STEM Pipeline fund. You can learn more about all the previously selected @Scale projects at the Department of Higher Education’s STEM Pipeline website: http://www.mass.edu/forinstitutions/prek16/pipelinescale.asp.

This Request for Proposal (RFP) calls for projects that address Student Academic Achievement (goal #2) and Educator Effectiveness (goal #5) with a focus on mathematics, science or technology/engineering in elementary and middle grade levels and/or Student Interest (goal#1) and Educator Effectiveness (goal #5) in pre-K education programs.

This RFP and subsequent selection and grant award process will complete the selection of the Phase III and IV project cohorts and finalize the @Scale projects portfolio.
II. Purpose

Massachusetts benefits from an abundance of STEM projects and programs. Many of these reflect local school and community priorities and are supported by local resources while others are national initiatives reflecting the priorities of the respective funding organization. These projects benefit their targeted audiences and add value to STEM education overall. However, too often, such projects are not designed nor implemented with the intention of affecting transformative, system-wide and sustainable improvements that are consistent with or complementary to the goals described in the Massachusetts STEM plan.

The purpose of the @Scale initiative is to provide a framework for the selection, endorsement and promotion through public/private matching funding of “best practice” projects that advance the commonwealth’s readiness to achieve the goals defined in the STEM plan.

Through this RFP, the Massachusetts Department of Higher Education, supported by representatives of the STEM Operations Board, will select up to 5 qualifying projects to be referred to the STEM Council for @Scale endorsement and public matching grants. Qualifying projects must:

- Address the goals defined in Massachusetts STEM plan of Academic Achievement and Educator Effectiveness for elementary and middle school programs or Student Interest and Educator Effectiveness for early education and care programs,
- Identify target student/educator populations to be served and address/describe how the proposed project is anticipated to achieve projected outcomes and how those projected outcomes will be measured and tracked,
- Demonstrate history of successful outcomes for the targeted populations of students and educators,
- Incorporate design characteristics, infrastructure and support systems that support scale-up and/or replication, as well as, sustainability to serve many more students/workers/educators, statewide,
- Effectively use data to target, quantify and project outcome improvements in context of the goals defined in Massachusetts STEM Plan,
- Document cost-effectiveness on a per-student/teacher basis,
- Incorporate education partners representing schools and/or school districts, early education and care provider organizations, colleges and universities, out-of-school or after-school programs and the Regional STEM Networks,
- Reference prior formative and summative assessments, evaluations and outcomes, preferably conducted by independent 3rd party evaluators,
- Identify private (non-state) funding partners that will support the project with matching funds based upon a target of $1:$3 public to private funding (Massachusetts state funds matched to private (corporate or foundation) or other sources (federal programs e.g. NSF, DOE, other).
III. Need

This Request for Proposal (RFP) calls for projects that address Student Academic Achievement (goal #2) and Educator Effectiveness (goal #5) with a focus on mathematics, science or technology/engineering in the elementary and middle school grade levels and/or Student Interest (goal #1) and Educator Effectiveness (goal #5) in pre-K education programs.

A. Student Achievement

Massachusetts is regarded as a leader in STEM education based on many factors, including, (1) year over year improvement in test scores in math and science as measured by the Massachusetts Comprehensive Assessment System (MCAS, (2) consistently high ranking on the National Assessment of Education Progress (NAEP) in 4th and 8th grade mathematics and science, and (3) strong placement on international standardized tests such as the Trends in International Mathematics and Science Study (TIMSS).

When specifically reviewing the MCAS results, the data shows an increase in the percentage of Massachusetts 8th and 10th grade students scoring proficient or advanced on the mathematics and science exams from 2008 to 2010 and 2012. (Chart 1 and Chart 2).

![Chart 1](image-url)
On the NAEP mathematics and science test, Massachusetts' forth and eighth grade students consistently outperformed the national average and in 2011 ranked first in the nation in mathematics (Chart 3 and Chart 4).

Chart 3
However, these broad measures of success mask the performance of many students, especially from those groups underrepresented in STEM careers and students from schools in communities of lower socio-economic ranking. 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. 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.

Charts 5, 6 and 7 below provide clear measures of the socio-economic achievement gap. It is important to note that there are significant indications of progress in both mathematics and science for all students and especially for those from communities of low income ranking, however, that this gap exists is unacceptable. We can and must do better for ALL students.

---

1 Per 2010 Massachusetts Comprehensive Assessment Exams (MCAS)
In addition to socio-economic status, the following analysis of the achievement levels of students of color reflects the same gap (Charts 8, 9, 10).
Chart 8

Chart 9
To change this pattern we must engage all students and especially African American and Latinos from economically disadvantages areas, through in-school as well as after-school and out-of-school time programs that are culturally relevant and provide appropriate student and teacher supports to ensure early successes that will cascade and be sustained through higher grade levels. Such programs begin in Early Education and Care and extend through Elementary grades and into Middle School.

**B. Student Interest**

While Massachusetts leads the nation in overall STEM academic high school students’ interest remains below the national average and behind other leading technology states. An analysis by the University of Massachusetts Donahue Institute of college major preferences expressed by high school graduates on the 2012 SAT found that while 38.9% of Massachusetts public high school students indicate interest in pursuing STEM careers, (an increase from 25.6% in 1999) Massachusetts ranks lower than the national average of 43.4% and below our two chief competitor states, North Carolina (47.7%) and California (43.8%). For a state uniquely positioned as high performing in terms of student STEM achievement; it seems counter-intuitive that Massachusetts has significantly lower interest in the STEM fields.

This measure of student interest is further complicated by the fact that non-white students express interest in STEM at a significantly higher percentage - 45% than their white student counterparts - 36.8% (Chart 11).
Moreover, students from communities of lower socio-economic ranking also express interest in STEM at a higher percentage – 42.8% than their more affluent counterparts – 37.9% (Chart 12).

C. Interest and Achievement

The data presented previously in this section suggests an opportunity to leverage the higher level of interest in STEM careers expressed by students from underrepresented groups and those from communities of lower socio-economic ranking to engage these students in programs at early ages, pre-K, elementary and middle school to support their already improving academic achievement and accelerate their readiness to pursue rigorous STEM subjects in high school leading to post-secondary STEM programs and careers. We strongly encourage proposals that address this challenge and make use of data to support program design and measurement of student and educator outcomes.
IV. Proposal Requirements

1. Project Abstract (one page). Include the following:
   - Name of project
   - Type of project (Student Academic Achievement/Educator Effectiveness)
   - Target Population (students, include demographics such as grade level, educators, etc.)
   - Resumes of key personnel (attachment to proposal, does not impact page count)

2. Narrative (not to exceed 10 pages, with standard 1” margins, single or double spaced) that includes the following elements:
   - The project objective and goals.
   - The characteristics of the partner school(s) and district, or early education and care provider organization, specifically related to the demographics of the student population such as quantifiable measures of academic achievement and achievement gap.
   - 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.)
   - For what purposes will the requested funding be used (e.g. equipment or educational resources, teacher professional development, stipends…)
   - The expected outcomes and how they will be measured
   - Description of private matching commitments and disclosure of any existing gap to achieve the 1:3 ratio
   - Describe any relationship of the PreK-16 Regional STEM Network2 in support of the implementation of this project, if any
   - Plan for long-term sustainability
     i. Plan for sustainability of the project after the funding period expires.
   - The critical gaps the project addresses. As identified earlier, the critical gaps this RFP seeks to address are:
     i. Student academic achievement and educator effectiveness in elementary and middle school STEM
     ii. Student interest and educator effectiveness in STEM early education and care programs
   - 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 prior program success
   - A description of the ways in which your project links to any other key attributes of the Massachusetts’ STEM Plan

2 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.
• 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
• 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
• Evidence that the program has caused changes in practice at its present site

V. 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.
   2. A breakout of your private matching funds with the funder’s name and amount of funds contributed listed.

VI. 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 8% of the grant total.

The DHE has engaged with statewide evaluation consultants on the development of a STEM evaluation guideline which is now available to STEM project leaders, statewide. 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.

<table>
<thead>
<tr>
<th>Project Reporting Deadlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Year Progress Report</td>
</tr>
<tr>
<td>Year-End Progress Report</td>
</tr>
</tbody>
</table>

VII. Eligibility

A. General Program Attributes:

Non-profit’s, higher education institutions, early education and care providers are eligible to participate in this program.

Projects must address the goals defined in the Massachusetts STEM Plan specifically the goals of Student Interest, Student Academic Achievement and Educator Effectiveness and are strongly encouraged to address the “achievement gap” in mathematics and science.

Projects must describe and document the commitment of schools, school districts or early education and care providers to successful implementation and future sustainability of the project.

Projects must use data to identify and quantify the STEM education challenges to be addressed by this project and measured as outcomes of the project.

Projects must be grounded in research and have a demonstrable history of achieving positive student outcomes documented through independent evaluations.

Projects must begin in calendar year 2013 and must be completed by the end of calendar 2014.

B. Scalability

Projects must:

Be based on prior successful initiatives, the principles of which, if not the complete design, should be incorporate in this scale-up proposal.

---

3 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.
Be grounded in research, designed for replication and scale-up, and have demonstrated prior success in achieving student and worker outcomes related to these challenges,

Demonstrate the ability to expand (scale-up or replicate) the delivery model beyond the original site.

Be designed, packaged and supported for ease of implementation at an adopting site.

As relevant to the project, address the application of in-classroom or online technologies to enhance student engagement and learning, support data systems that enable improved student success rates and support implementation scale-up

C. Funding:

Projects selected for @Scale endorsement by the STEM Council and eligible to receive STEM Pipeline grant funds must secure a commitment for matching private/other (business, foundations, federal agencies etc.) funding on a target ratio of $1:$3 (public:private).

List the name of funders and their matching contributions in your budget narrative

VIII. Submission Instructions

Proposals must meet the listed requirements and general program attributes listed in this RFR. In addition, proposals must include any referenced attachments and materials.

In order to be considered for selection, proposal responses must be received no later than close of business on July 19, 2013.

Please submit your completed proposal via email to:

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

In the subject title write “@Scale Proposal Response” for easier identification of your proposal submission.

Submission Email: kconnors@bhe.mass.edu

Representatives of the Operations Board of the STEM Council will review the proposal responses and will score them using a common scoring rubric. The executive members of the STEM Council and the STEM Council Executive Director will make the final selection decisions.
IX. Implementation Timeline

<table>
<thead>
<tr>
<th>RFR Timeline</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Release of RFR</td>
<td>May 22, 2013</td>
</tr>
<tr>
<td>Information Session</td>
<td>June 4, 2013</td>
</tr>
<tr>
<td>Submission of written inquiries</td>
<td>June 14, 2013</td>
</tr>
<tr>
<td>Response to written inquiries</td>
<td>Within 2 days of receipt</td>
</tr>
<tr>
<td>Deadline for response submissions</td>
<td>COB, July 19, 2013</td>
</tr>
<tr>
<td>Notification of award</td>
<td>August 16, 2013</td>
</tr>
</tbody>
</table>

X. Awards

The STEM Pipeline Fund commits $250,000 to support up to 5 implementation projects that address improvements in STEM Student Achievement, Interest and Educator Effectiveness projects. The funding range for individual projects is anticipated to be between $50K and $75K per project. These public funds will be allocated based upon a match of private or other non-state funds targeted at a ratio of $1:$3 (public:private/other).

A. Projects selected as candidates to receive grants from the STEM Pipeline fund will be announced August 16 2013.

1. Projects that have secured private sector matching funds at the targeted ratio of $1:$3 will receive their initial disbursement of STEM Pipeline Funds within three weeks of award notification.

2. Projects that have not secured private sector matching funds at the targeted ratio of $1:$3 will have until October 1, 2013 to do so.

3. Projects that do not secure private sector matching funds at the targeted ratio of $1:$3 by October 1, 2013 will be deferred for possible future funding consideration.

XI. 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;
- Engagement (as appropriate) with 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.
XII. **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: __________________________

<table>
<thead>
<tr>
<th>Categories</th>
<th>Total Grant Funds Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Salaries:</td>
<td>$</td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
</tr>
<tr>
<td>Support Staff</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Fringe Benefits</td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td></td>
</tr>
<tr>
<td>Contractual Services</td>
<td></td>
</tr>
<tr>
<td>Total Supplies &amp; Materials</td>
<td>$</td>
</tr>
<tr>
<td>Curriculum</td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>Tuition &amp; Stipends</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td></td>
</tr>
<tr>
<td>Indirect Costs (10% Max)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$</td>
</tr>
<tr>
<td><strong>Plus Private Matching Funds</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>$</td>
</tr>
</tbody>
</table>

Calculate Unit Cost/Student and enter here: $__________

Calculate Unit Cost/Teacher and enter here: $__________

May 22, 2013