

## Implementation Plan

	<p><b>Phase One:</b> Introduce STEM as an extracurricular club (Summer Workshop) for grade 4 students. The program will run for 4 weeks and will introduce students to STEM teaching/learning style, while completing a science-based Engineering is Elementary (EiE) unit of study or design challenge.</p>	<p><b>Phase Two:</b> Introduce the STEM shift into one grade 4 classroom, and one content area (science), led by a Teacher Facilitator (and supported by the STEM Leader). The Teacher Facilitator will use the Boston Museum of Science Engineering is Elementary (EiE) units to facilitate introduction of this program shift.</p>	<p><b>Phase Three:</b> Introduce the STEM shift into all four grade 4 classrooms and one content area: Science. The teaching team will use Boston Museum of Science Engineering is Elementary (EiE) units to begin this program shift but will also consider the integration of other units of study, or creation of original units of study, to align with curriculum demands and NGSS/CCSS standards.</p>
Target Timeline	09/01/2017-09/01/2018	09/01/2018-/09/01/2019	09/01/2019-09/01/2020
Key Stakeholders	<ul style="list-style-type: none"> <li>• STEM Leader</li> <li>• Students/Families</li> <li>• Administrative Team</li> </ul>	<ul style="list-style-type: none"> <li>• STEM Leader</li> <li>• Teacher Facilitators</li> <li>• Students/Families</li> <li>• Administrative Team</li> </ul>	<ul style="list-style-type: none"> <li>• STEM Leader</li> <li>• Teacher Facilitators</li> <li>• Students/Families</li> <li>• Administrative team</li> <li>• Community Partners</li> <li>• STEM career professionals</li> </ul>
Key Questions to Be Addressed	<ul style="list-style-type: none"> <li>• Is there community interest in a STEM program?</li> <li>• What types of support and/or involvement from the community are necessary to make this type of program successful?</li> <li>• What resources are needed to support a STEM program?</li> <li>• What challenges arise when teaching STEM Units of Study?</li> <li>• How will these challenges affect STEM integration into the school day?</li> <li>• What training will be necessary</li> </ul>	<ul style="list-style-type: none"> <li>• What challenges arise when teaching STEM Units of Study?</li> <li>• How do STEM units of study fit into the school day/school schedule?</li> <li>• What adjustments (if any) need to be made to the school schedule to allow for the success of a STEM program?</li> <li>• What professional development is necessary for facilitators of STEM Units of Study?</li> <li>• How can teachers assess and</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Please note:</b> In addition to the questions listed below, all the questions from Phase Two will continue to be relevant in Phase Three</li> <li>• When, where, and how often does the STEM teaching team need to meet to review curriculum, discuss effectiveness, and make changes?</li> <li>• How do we measure teacher effectiveness at delivering STEM content?</li> <li>• How do we begin to consider expanding STEM curriculum to other grade levels?</li> <li>• What steps need to occur to begin the integration of STEM curriculum across content areas, beginning with math and</li> </ul>

	<p>for facilitators of STEM Units of Study?</p> <ul style="list-style-type: none"> <li>• How do STEM units of study align with grade 4 curriculum standards?</li> <li>• Are students interested and/or engaged in STEM Units of Study?</li> <li>• How can different learning needs and/or styles be addressed in the STEM model?</li> <li>• How can student progress and achievement be measured and assessed in a STEM model?</li> </ul>	<p>measure student progress in the STEM classroom?</p> <ul style="list-style-type: none"> <li>• How do STEM units of study align with school and district goals?</li> <li>• What (if any) modifications need to be made to improve STEM alignment with school and district goals?</li> <li>• What resources are needed to support the integration of STEM into the school day?</li> <li>• How can technology be meaningfully integrated into the school day?</li> <li>• How can a teacher measure his/her effectiveness as a facilitator of instruction as opposed to a deliverer of content?</li> </ul>	<p>art?</p> <ul style="list-style-type: none"> <li>• What does vertical alignment look like with STEM Curriculum?</li> <li>• What community partners, professional leaders, and/or field trip opportunities can be used to supplement and/or enhance STEM education at our school?</li> <li>• How can we meaningfully measure student engagement in STEM curriculum?</li> <li>• How can we extend STEM learning beyond the school day for students?</li> <li>• How can we involve families and the greater community in the STEM learning process?</li> </ul>
Key Marketing and/or Communication	<ul style="list-style-type: none"> <li>• Communicate with administrative team at beginning of 2017 school year about intent to introduce the STEM Club in summer 2018</li> <li>• Communicate with families about the introduction of this club and start measuring community interest</li> </ul>	<ul style="list-style-type: none"> <li>• Communicate with administrative team during the 2017 school year about the intent to introduce a single grade 4 STEM classroom during the 2018 school year</li> <li>• Begin networking with STEM professionals who can support program of study and “real world” learning opportunities for students</li> </ul>	<ul style="list-style-type: none"> <li>• Communicate with administrative team during the 2018 school year about the intent to make all grade 4 classrooms STEM classrooms during the 2019 school year</li> <li>• Continue networking with STEM professionals who can support program of study and “real world” learning for students</li> <li>• Work to identify a variety of STEM professionals that reflect the student body: woman, people of color, ELL, etc.</li> </ul>
Integration of Technology	<ul style="list-style-type: none"> <li>• Activboard for delivering content instruction</li> <li>• Student Laptops &amp; ipads for science journaling and research</li> <li>• Camera for tracking progress</li> <li>• Other technology as indicated by EiE unit of study</li> </ul>	<ul style="list-style-type: none"> <li>• Activboard for delivering content instruction</li> <li>• Student Laptops &amp; ipads for science journaling and research</li> <li>• Camera for tracking progress</li> <li>• Other technology as indicated by EiE unit of study</li> </ul>	<ul style="list-style-type: none"> <li>• Activboard for delivering content instruction</li> <li>• Student Laptops &amp; ipads for science journaling and research</li> <li>• Camera for tracking progress</li> <li>• Other technology as indicated by EiE unit of study</li> </ul>

<p>PD for Teachers</p>	<ul style="list-style-type: none"> <li>• STEM Leader will participate in Learner’s Edge class <i>Making the Shift to STEM Education</i> to begin understanding the intricacies of a STEM shift and the core tenants of STEM pedagogy</li> <li>• STEM Leader will participate in <i>EiE Workshop: Everyone Engineers</i>, which prepares elementary school teachers to use the EiE curriculum to integrate engineering and science instruction in the classroom.</li> <li>• If possible, the STEM Leader will also participate in an <i>EiE Workshop</i> specific to the Unit of Study selected for instruction for the summer program.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Facilitator will participate in <i>EiE Workshop: Everyone Engineers</i>, which prepares elementary school teachers to use the EiE curriculum to integrate engineering and science instruction in the classroom.</li> <li>• Teacher Facilitator will participate in other EiE Workshops specific to the units of study selected for instruction</li> </ul>	<ul style="list-style-type: none"> <li>• All teacher facilitators will participate in <i>EiE Workshop: Everyone Engineers</i>, which prepares elementary school teachers to use the EiE curriculum to integrate engineering and science instruction in the classroom.</li> <li>• All teacher facilitators will participate in other EiE Workshops specific to the units of study selected for instruction</li> <li>• All teacher facilitators will participate in in-district professional development around: improving STEM pedagogy in the classroom, reflecting upon EiE units of study, examining EiE alignment with school and district goals, creating original STEM units of study, and beginning the integration of additional content areas, such as math and the arts</li> </ul>
<p>How will you assess readiness to move into next phase?</p>	<ul style="list-style-type: none"> <li>• Student evaluation of the Summer Workshop</li> <li>• Family evaluation of the Summer Workshop</li> <li>• Reflection and evaluation of program and professional development by the STEM Leader</li> <li>• Approval by the Administration team to move on to Phase 2</li> </ul>	<ul style="list-style-type: none"> <li>• Student/family evaluation of EiE programming</li> <li>• Student assessment at end of EiE programming</li> <li>• Reflection and evaluation of program and professional development by the teacher facilitator</li> <li>• Approval by the Administration team to move on to Phase 3</li> </ul>	<p>N/A; this is the final STEM shift phase outlined at this time</p>
<p>Anticipated Roadblocks</p>	<ul style="list-style-type: none"> <li>• Time: On top of the demands of the traditional teaching day, the STEM Leader will need to find time to plan the unit of study, participate in professional development, and meet with administration to coordinate the logistics of a Summer Workshop. Furthermore, the STEM Leader</li> </ul>	<ul style="list-style-type: none"> <li>• Time! (see Phase 1)</li> <li>• Money! (see Phase 1)</li> </ul>	<ul style="list-style-type: none"> <li>• Time! (see Phase 1)</li> <li>• Money! (see Phase 1)</li> <li>• Teacher willingness to commit to a new unit of study and/or method of instructing in science and, eventually, other content areas</li> </ul>

	<p>will have to be willing to work (most likely without pay) for 4 weeks during summer vacation.</p> <ul style="list-style-type: none"> <li>• Money! Grant/Scholarship money will be required to supplement any money provided by the school district.</li> </ul>		
How will you know you've been successful?	<ul style="list-style-type: none"> <li>• Student interest and participation in the Summer Workshop</li> <li>• Successful completion of the EiE unit of study</li> <li>• Positive student/family/STEM Leader feedback</li> </ul>	<ul style="list-style-type: none"> <li>• Student interest and participation in STEM units of study</li> <li>• Student performance (measured formally and informally)</li> <li>• Successful completion of the EiE unit of study</li> <li>• Positive student/family/teacher facilitator feedback</li> <li>• STEM professional interest in/engagement with classroom learning experiences</li> </ul>	<ul style="list-style-type: none"> <li>• Student interest and participation in STEM units of study</li> <li>• Student performance (measured formally and informally)</li> <li>• Successful completion of the EiE unit of study</li> <li>• Positive student/family/teacher facilitator feedback</li> <li>• STEM professional interest in/engagement with classroom learning experiences</li> <li>• Interest in expanding the program to include other grade levels within the school or district</li> </ul>
Community Connections	None identified at this time.	<ul style="list-style-type: none"> <li>• STEM professionals to volunteer time to visit the classroom</li> <li>• Technology grant/support</li> </ul>	<ul style="list-style-type: none"> <li>• STEM professionals to volunteer time to visit the classroom</li> <li>• Technology grant/support</li> </ul>
Resources Needed	<ul style="list-style-type: none"> <li>• Supplementary grant funding for EiE Unit of Study and/or professional development</li> <li>• Grant funding for STEM Leader participation in Learner's Edge STEM class</li> <li>• Technology: student laptops, ipads, cameras</li> <li>• EiE Unit materials (varies by unit)</li> <li>• Classroom/instructional space for Summer Workshop</li> </ul>	<ul style="list-style-type: none"> <li>• Supplementary grant funding for teacher facilitator participation in an EiE unit of study training and/or general STEM professional development</li> <li>• Technology: student laptops, ipads, cameras</li> <li>• EiE Unit materials (varies by unit)</li> </ul>	<ul style="list-style-type: none"> <li>• Supplementary grant funding for all teacher facilitators to participate EiE unit of study training and/or general STEM professional development</li> <li>• Technology: student laptops, ipads, cameras</li> <li>• EiE Unit materials (varies by unit)</li> <li>• Additional funding for supplementary STEM materials and science supplies (as needed)</li> </ul>