

**New Hampshire NCLB Title II-D  
Regular Funds for Round 9  
Competitive Grants – February 2011**

**Step 2: Application Narrative for Classroom Mini-Grants Program**

(Please be sure to complete Step 1 online at: [www.nheon.org/oet/nclb](http://www.nheon.org/oet/nclb))

District:	<b>Stratford Public School</b>	Date	<b>2/28/11</b>
Project Manager:	<a href="#">Steven Hoyt</a>	:	
Position Title:	<a href="#">District Technology Coordinator</a>		
Mailing Address:	<a href="#">19 School St, Stratford NH 03590</a>		
Email Address:	<a href="mailto:S_hoyt@sau58.org">S_hoyt@sau58.org</a>		
Phone:	<a href="#">922-3387</a>		

***BE SURE TO READ ALL OF THE FOLLOWING STATEMENTS.***

**ASSURANCES**

I hereby certify that:

1. To the best of my knowledge, the information contained in this application is correct, and the school board of the district named above has authorized me as its representative to submit this application.
2. The District has submitted to the New Hampshire Department of Education (NHDOE) a General Assurances signature page for the current year.
3. The District has consulted with the appropriate non-public schools during the design and development of this Ed Tech project prior to all decisions that affect the opportunities of private school children to participate in the program.
4. All funding for this project will be obligated and reported no later than the quarterly report ending **6/30/2012** and expended and reported no later than quarterly report ending **9/30/2012**.
5. The grant funds expended will supplement, not supplant, funds from non-federal sources.
6. The District will keep records and provide information to the NHDOE as may be required for program evaluation, consistent with responsibilities under NCLB Title II-D as outlined within the Grant Application Guidance (e.g., annual tech survey, case study report).
7. The schools to be funded by this program are compliant with the Children's Internet Protection Act (CIPA) because the district employs a filtering mechanism for student access or because Ed Tech funds referenced in this application will NOT be used to purchase computers used to access the Internet or pay for direct costs associated with accessing the Internet.

**Superintendents: When you submit your final grant application in the online grants management system, you will be certifying the above assurances.**

# Application Form for Classroom Tech Mini-Grant

Applicant: Stratford Public School

Criteria	<p><b>Applicants:</b> Criteria used to review each grant application are listed in the left column. Please do not delete the criteria column. By using this right column to describe how your project proposes to meet the criteria, you can increase the likelihood that you won't leave out important information. There is no page limit, but please be as clear and concise as possible.</p>
<p><b>Project Abstract (10 points)</b> A clear and concise abstract (<b>100-150 word limit</b>) outlines the mini grant project and overall goals, along with the process for implementing it in the classroom.</p>	
<p>1. Describes the project, including grade level(s) and content area(s), indicates how this project fits into school/district curriculum, indicates process for implementation and assessment, as well as how it would advance the achievement of students.</p>	<p>The Stratford School Greenhouse Project is an original project formulated by the science and technology departments which have developed interdisciplinary exploration projects in which students grades six through twelve will use scientific inquiry and critical thinking skills. The biology class will design plant experiments, the chemistry class will design chemical and watering experiments and grades one through five will plant their own plants to monitor.</p>
<p>2. Abstract includes an essential question, connected to the state frameworks, which probes for deeper meaning and broader understanding of the framework content addressed by this project, fostering the development of higher order thinking and problem solving.</p>	<p>Stratford School's Science classes (Grades 6-12) will answer the question "Can technology enhance the growing capacity in a Greenhouse". This project will use technology to create sustainable agriculture using multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school.</p>

**Project Description  
(50 points)**

Describes project in general terms and indicates whether it is a replicated project or an original project. Projects which can directly impact more than one classroom are preferred.

If project is replicated, proposal describes the intended changes to the project idea and how they will improve the project in order to be appropriate for the situation. Includes specific goals and objectives that relate to the essential question, and explains how those goals will be achieved by the project. Include a rationale for any changes made to the original project.

If your project is original, proposal describes how the project is appropriate for current situation. Includes specific goals and objectives that relate to the essential question, and explain how those goals will be achieved by the project.

<p>1. Proposal generally discusses how implementing this project will improve technology integration within classrooms and in the core content areas. Indicates the need for technology integration in school or district. Describes the determination of need for this project and includes one or more examples of data that support the rationale of need for the project, such as NECAP assessment or other data. This explains to the reviewer why the project is worthy of funding as it relates to student achievement.</p>	<p>The greenhouse is part of the homestead of a retired teacher who has a passion for technology and alternative fuel options. His knowledge and passion can help ignite a fire in our students that will serve them well as new technological advances carry them into adulthood providing opportunities for employment over the web despite the current lack of a business base operating from our town. We will set up several areas within the greenhouse to run controlled experiments on different growing parameters. The Robotics we are using is Lego Mindstorm NXT and have recruited Tufts University ( See Letter of Support) and Bill Church who is an educator assistant with Tufts to assist us with the all facets of implementation and training with NXT robotic and as a resource for professional development. The science classes will be able to view the greenhouse on an interactive white board and send commands back to the robots with instructions on how the different parameters should be adjusted in each area of the greenhouse. Once we have worked out the controls and monitoring glitches, we will put this up on our school website and offer it as a resource to other schools across the state. I have contacted the remainder of the schools in our SAU ( See letters of support) and also Bethlehem Elementary School who will be using this as part of their Reach Curriculum. We also plan to harvest the vegetables and serve them in our monthly senior meals that the students prepare for members of our community.</p> <p>The addition of an interactive whiteboard would be a tremendous boost to the use of technology in the science class. It would facilitate collaboration between the science teachers and special education. The tool would also give teachers the ability to prepare lessons well in advance. Using the interactive whiteboards we would have access to an extensive on-line community of educators. This on-line community offers access to an extensive library of proven methods and resources to teach students of all levels and types. This would also allow us to easily share these lessons with other educators interested in using our greenhouse link.</p> <p>Our NECAP scores have indicated that between 77 and 82% of our students are partially or substantially below proficient in Science as determined by the 2010 NECAP Science Test scores. The science team has met and reviewed the school and individual scores and it was determined that a more hands on approach to science would enhance student involvement, promote higher level thinking and eventually lead to improved test scores in Science</p>
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2. Project is focused on one or more content areas, with the proposal indicating which content area and associated standards are the main focus. Proposal indicates how the project will address ICT literacy skills without focusing solely on the acquisition of ICT literacy skills devoid of core content learning.

**MA – 5.1.6.1**

**Collect, organize, describe, represent, and interpret data in both simulations and real world situations.**

**MA -5.1.6.2**

**Simulate, display, graph, and analyze data using technology and other means.**

**Through the use of smart book activities, web 2.0 tools and computers students will do research and comprise data on local and world happenings in the science field.**

Students will demonstrate an increasing ability to analyze, synthesize, and communicate scientific information using technology.

**SC – 2.3.6.4**

**Use technology to share data with classmates or other groups of students.**

Science (S:SPS3:4:2.2)

Develop questions based upon their observations about the natural world and design a simple investigation.

Science (S:SPS3:4:2.4)

Locate and collect information about the environment and environmental and natural resources topics.

Science (S:SPS4:2:5.1)

Use computer software and various technologies as appropriate to display and communicate information and ideas. Science Process Skills SPS4- Science Skills for Information, Communication and Media Literacy (from ICT Literacy Map for Science, [www.21stcenturyskills.org](http://www.21stcenturyskills.org))

Science (S:SPS4:4:1.2)

Use appropriate tools to measure and graph data. 2. COMMUNICATION SKILLS

**Through the use of smartbook activities, web 2.0 tools and computers students will do research projects and using Microsoft office suite can make an presentation for the class and add to it as the class is reviewing the presentation. Interactive games such as jeopardy can be used to include the entire class.**

This project will address the following technology standards (ISTE NETS-S, 2007<sup>1</sup>): NETS-S 4. Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:

- a. identify and define authentic problems and significant questions for investigation.
- b. plan and manage activities to develop a solution or complete a project.
- c. collect and analyze data to identify solutions and/or make informed decisions.
- d. use multiple processes and diverse perspectives to explore alternative solutions.

NETS-S 6. Technology Operations and Concepts: students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

- a. understand and use technology systems.
- d. transfer current knowledge to learning of new technologies.

<p>3. Proposal describes in detail the project based learning unit(s) that will encompass the project, and project features support acquisition of digital and media literacy skills. Project based learning (or problem based learning) with a constructivist approach and essential questions are the heart of these projects. Team projects must show evidence that these pedagogies are clearly understood and applied.</p>	<p>Students are expected to grow in their ability to reason effectively with information represented in graphic, numeric, symbolic and verbal forms and move flexibly among these representations” (Getting to Know CMP, 1996). Though each unit is not project based per se, it could be argued that each investigation is interactive by design and therefore very appropriate for whiteboard technology. Students would be able to explore multiple approaches to problems and receive immediate feedback. Collaboration and communication would be enhanced and students would be more invested in problem solving thus less willing to give up so quickly. Spatial investigations would be greatly improved by the ability to touch and manipulate 3-D figures on the whiteboard.</p> <p>The greenhouse is part of the homestead of a retired teacher who has a passion for technology and alternative fuel options. His knowledge and passion can help ignite a fire in our students that will serve them well as new technological advances carry them into adulthood providing opportunities for employment over the web despite the current lack of a business base operating from our town.</p> <p>Our students are very interested in robotics as well as the other technology we have been able to secure for our school. This project will help them use that technology to create sustainable agriculture using multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school. We also plan to harvest the vegetables and serve them in our monthly senior meals that the students prepare for members of our community</p>
<p>4. Proposal identifies and explains at least three specific learning goals the team needs to address in its professional development activities and how the proposed professional development will address these.</p>	<p>Our goals will be to:</p> <ol style="list-style-type: none"> <li>1. Help our students gain “fluency” in Science and mathematics, meaning that they understand that scientific way of speaking and thinking. The data collected can be analyzed and disseminated in mathematical terms that is universal and attainable to all. In a global world it is the most common language. ( SAHE Grant- Math Program)</li> <li>2. Help students to make a connection between science, mathematics and technology (Tufts University Collaboration)</li> <li>3. Build STEM skills by teaching algorithms, logic, and programming in a medium appropriate to the grade level. ( Stem Workshops Spring 2011)</li> <li>4. Foster 21<sup>st</sup> Century technology skills with daily collaboration on a SMART board, and with more digital tools in the classroom, rather than limiting technology integration to the standard 45-minutes-once-per-week schedule. ( Ongoing Technology Training)</li> </ol>

<sup>2</sup> <http://www.nheon.org/ictliteracy/kit1.html>

5. Proposal indicates that support has been obtained from the superintendent AND the principal, preferably by attaching letters of support within the grant application pages (not as separate files). Such support acknowledges that he/she has read the RFP, understands the requirements, and will allow the applying team to fulfill the requirements, if they are awarded the grant.

The letters of support from the Superintendent and our school principal exemplify the total support our administration has in integrating technology into the classroom. We have applied for and received a SAHA grant which is providing our school and many others in the North Country with a technology integration specialist. We have had teams including our administration as part of the 2010 TLAC groups. Technology Education in our school has moved from wood shop and mechanics to computers and robotics

From: Mr. Shallow

02-25-11

Subject: Letter of Support

To: Mr. Hoyt

1. I strongly recommend the approval of this grant project for Stratford Public School. The following is a brief summary of grant's purpose.
  - a. Students from every grade in our school will take part in this project to connect an existing "Hobby Homestead" Greenhouse to the school to answer the question: "Can technology enhance the growing capacity in the Greenhouse". To address this question the science and technology departments have developed interdisciplinary exploration projects in which students will use scientific inquiry and critical thinking skills. The biology class will design plant experiments, the chemistry class will design chemical and watering experiments and the elementary classes will plant their own plants to monitor. Once all controls and monitors are set up, this site will be available to any school interested in using this as part of their curriculum.
  - b. The main feature of this project is a 50 x 20 Greenhouse at the home of a retired computer teacher. This teacher and I feel that the computer controls we can set up would be a controlled area that would give students an advantage unavailable elsewhere in the North Country. Our students have done poorly in the Science NECAPs and the hands on experimentation would help substantiate many science principles in biology and chemistry.
  - c. Students will have direct contact with the greenhouse from the school; there will be multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school.
2. I believe this project is truly a "one of a kind" and will involve the students in real world applied technology. I strongly request grant approval for this project.

James D. Shallow  
Superintendent

Additional Letters of support are attached, because they will not fit in grant.

6. Proposal supports schools, teams, or districts that haven't participated in mini-grants previously or partners with such entities.

This would be our first title IID grant implementation but, our school district is committed to educating the 21<sup>st</sup> Century Student for whom mastering technology, providing alternative solutions, and implementing creative design will be essential life skills. Our team is dedicated to enabling our students to develop these skills. We understand that the trends in our culture drive the need for change and we realize the urgency for meaningful integration of these trends in our instruction. Leadership has encouraged us to become involved and we enter with eyes wide open. This project will involve 8 out of the 12 total teachers within our building and effect every elementary and middle school students and two thirds of our high school population which are enrolled in some type of science and/or technology course integrated into this project.. The systems are in place to allow for the necessary staff development; one team member has extensive experience teaching programming to the higher grades and another team member will be brainstorming with Bill Church, and Tufts University consultants on the robotics integration. Our school has been involved with Tufts programs for a number of years through their STOMP outreach program and we were chosen as an experimental site for the Physic through Lego program. We have facilities/equipment for webinars, and equipment for video editing. We have a dynamic technology department that supports us and an administrative team which encourages us. We also have a number of SMART board-using teachers on staff, and have learned quickly that dedicating SMART boards in classrooms is the best way to encourage consistent and frequent use of the Interactive equipment.



<p>7. Proposal indicates partnerships which involve NH teacher preparation program faculty.</p>	<p>This would be our first title IID grant implementation but, our school district is committed to educating the 21<sup>st</sup> Century Student for whom mastering technology, providing alternative solutions, and implementing creative design will be essential life skills. Our team is dedicated to enabling our students to develop these skills. We understand that the trends in our culture drive the need for change and we realize the urgency for meaningful integration of these trends in our instruction. Leadership has encouraged us to become involved and we enter with eyes wide open. This project will involve 8 out of the 12 total teachers within our building and effect every elementary and middle school students and two thirds of our high school population which are enrolled in some type of science and/or technology course integrated into this project.. The systems are in place to allow for the necessary staff development; one team member has extensive experience teaching programming to the higher grades and another team member will be brainstorming with Bill Church, and Tufts University consultants on the robotics integration. Our school has been involved with Tufts programs for a number of years through their STOMP outreach program and we were chosen as an experimental site for the Physic through Lego program. We have facilities/equipment for webinars, and equipment for video editing. We have a dynamic technology department that supports us and an administrative team which encourages us. We also have a number of SMART board-using teachers on staff, and have learned quickly that dedicating SMART boards in classrooms is the best way to encourage consistent and frequent use of the Interactive equipment.</p> <p><b>Engaged Communities.</b> We have built partnerships with Plymouth State, NCIC and collaboration within the community to support and fund the use of ICT and digital resources. We are also using the expertise of Tufts University on robotics and Several Local Professional Greenhouses on horticulture throughout the project and will publish our project on the SAU 58 web site for the community to share in our project</p>
<p>8. Proposal indicates thoughtful inclusion of students with special needs and uses appropriate technology to assist those learners in order to promote the achievement of all students.</p>	<p>Our premise is that using a tool like an interactive whiteboard will be a delivery mechanism that will engage students and generate new interest in the curriculum. Additionally an interactive whiteboard would assist in the teaching of individuals with different learning styles. A visual learner would have a wide range of colors and media options to help increase understanding. A kinesthetic learner would be able to touch and manipulate objects on the board. The auditory learner would be able to take advantage of sound. Certain types of special education students would benefit from the tactile feedback that the board can provide.</p>

<p>9. Proposal indicates plans for dissemination of the project to other schools and districts throughout the state, including presentations at 2 or more venues.</p>	<p><b>Engaged Communities.</b> We have built partnerships with Plymouth State, NCIC and collaboration within the community to support and fund the use of ICT and digital resources. We are also using the expertise of Tufts University on robotics and Several Local Professional Greenhouses on horticulture throughout the project and will publish our project on the SAU 58 web site for the community to share in our project</p> <p>Students will use data analysis, statistics and probability to analyze given situations and the outcomes of experiments. We will be capturing the classroom and greenhouse activities to use in our presentation. Part of our project is having the students identify specific plants and set up time lapse photography, which will also be in our presentation. If the internet connection allows we will offer a live feed to the greenhouse during our presentation also.</p> <p>Our Superintendent, Principal and Technology Director have participated in the formation of this grant application and are highly supportive of our participation in this project. Additionally, we as a school community understand the requirements of the Mini-Grant in general, including workshop participation, production of the documentary, attendance at Celebration Day, and presenting results to the faculty and at a state conference. Each year we have a technology night to show the community the technology projects the school has undertaken throughout the year and next year this will be the highlight of the event.</p>
<p>10. Proposal indicates specific plans for video production training as needed and an outline for the promotional video that describes the various stages of design and implementation of the project.</p>	<p><b>Skilled Personnel.</b> We have a media specialists which will help collaborate with teachers and students on this project. We have a technology integrator specialist in the school. Their responsibilities include helping teachers to use the technology they have in their classrooms. The teachers will seek help from the technology coordinator and the technology integrator throughout the year for help on video editing and interactive whiteboard training, Our Director of Technology will continue to support the teachers throughout this project. He can help co-teach the lessons and provide on-going, sustained, high-quality support for teachers in the use of ICT appropriate skills.</p>
<p><b>Capacity for Success (35 points)</b> Describes the capacity of each team member to achieve meaningful success at achieving the goals of the Tech Mini-Grant Program in the school or district. Clearly articulates the program and policies in place that will support success in terms of professional development, technology leadership, and how this program would meet specific achievement needs of the students.</p>	

<p>1. Proposal demonstrates capacity for success by providing strong evidence that school/district and the individual team members are willing and able to conduct the scope of work involved in implementing this project.</p>	<p><b>Shared vision</b> for technology constructed by all the stakeholders. Our district’s shared vision is: “It is the school district’s responsibility to provide access to technology, training, and technical assistance support for systems operations and curriculum integration. We are committed to participation in the creation of educational technology through collaboration with communities throughout the world.” This project is a reflection of our district’s vision.</p> <p><b>Skilled Personnel.</b> We have a media specialists which will help collaborate with teachers and students on this project. We have a technology integrator specialist in the school. Their responsibilities include helping teachers to use the technology they have in their classrooms. The teachers will seek help from the technology coordinator and the technology integrator throughout the year for help on video editing and interactive whiteboard training, Our Director of Technology will continue to support the teachers throughout this project. He can help co-teach the lessons and provide on-going, sustained, high-quality support for teachers in the use of ICT appropriate skills.</p>
<p>2. Proposal describes why participation in this effort is appropriate for district and the capacity the school or district has that will insure the success of the project.</p>	<p>This would be our first title IID grant implementation but, our school district is committed to educating the 21<sup>st</sup> Century Student for whom mastering technology, providing alternative solutions, and implementing creative design will be essential life skills. Our team is dedicated to enabling our students to develop these skills. We understand that the trends in our culture drive the need for change and we realize the urgency for meaningful integration of these trends in our instruction. Leadership has encouraged us to become involved and we enter with eyes wide open. This project will involve 8 out of the 12 total teachers within our building and effect every elementary and middle school students and two thirds of our high school population which are enrolled in some type of science and/or technology course integrated into this project.. The systems are in place to allow for the necessary staff development; one team member has extensive experience teaching programming to the higher grades and another team member will be brainstorming with Bill Church, and Tufts University consultants on the robotics integration. Our school has been involved with Tufts programs for a number of years through their STOMP outreach program and we were chosen as an experimental site for the Physic through Lego program. We have facilities/equipment for webinars, and equipment for video editing. We have a dynamic technology department that supports us and an administrative team which encourages us. We also have a number of SMART board-using teachers on staff, and have learned quickly that dedicating SMART boards in classrooms is the best way to encourage consistent and frequent use of the Interactive equipment.</p> <p><b>Shared vision</b> for technology constructed by all the stakeholders. Our district’s shared vision is: “It is the school district’s responsibility to provide access to technology, training, and technical assistance support for systems operations and curriculum integration. We are committed to participation in the creation of educational technology through collaboration with communities throughout the world.” This project is a reflection of our district’s vision.</p> <p><b>Engaged Communities.</b> We have built partnerships with Plymouth State, NCIC and collaboration within the community to support and fund the use of ICT and digital resources. We are also using the expertise of Tufts University on robotics and Several Local Professional Greenhouses on horticulture throughout the project and will publish our project on the SAU 58 web site for the community to share in our project.</p>

<p>3. Proposal describes any structures, policies, and/or procedures already in place in school or district that support the project and the project-based learning philosophy.</p>	<p><b>Shared vision</b> for technology constructed by all the stakeholders. Our district’s shared vision is: “It is the school district’s responsibility to provide access to technology, training, and technical assistance support for systems operations and curriculum integration. We are committed to participation in the creation of educational technology through collaboration with communities throughout the world.” This project is a reflection of our district’s vision.</p> <p><b>Engaged Communities.</b> We have built partnerships with Plymouth State, NCIC and collaboration within the community to support and fund the use of ICT and digital resources. We are also using the expertise of Tufts University on robotics and Several Local Professional Greenhouses on horticulture throughout the project and will publish our project on the SAU 58 web site for the community to share in our project.</p> <p>Our students are very interested in robotics as well as the other technology we have been able to secure for our school. This project will help them use that technology to create sustainable agriculture using multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school. We also plan to harvest the vegetables and serve them in our monthly senior meals that the students prepare for members of our community.</p>
<p>4. Proposal discusses the abilities and expertise of the individual team members with respect to their ability to collaborate, organize, schedule, and deliver a successful project to their students.</p>	<p><b>Engaged Communities.</b> We have built partnerships with Plymouth State, NCIC and collaboration within the community to support and fund the use of ICT and digital resources. We are also using the expertise of Tufts University on robotics and Several Local Professional Greenhouses on horticulture throughout the project and will publish our project on the SAU 58 web site for the community to share in our project.</p> <p>This would be our first title IID grant implementation but, our school district is committed to educating the 21<sup>st</sup> Century Student for whom mastering technology, providing alternative solutions, and implementing creative design will be essential life skills. Our team is dedicated to enabling our students to develop these skills. We understand that the trends in our culture drive the need for change and we realize the urgency for meaningful integration of these trends in our instruction. Leadership has encouraged us to become involved and we enter with eyes wide open. This project will involve 8 out of the 12 total teachers within our building and effect every elementary and middle school students and two thirds of our high school population which are enrolled in some type of science and/or technology course integrated into this project..The systems are in place to allow for the necessary staff development; one team member has extensive experience teaching programming to the higher grades and another team member will be brainstorming with Bill Church, and Tufts University consultants on the robotics integration. Our school has been involved with Tufts programs for a number of years through their STOMP outreach program and we were chosen as an experimental site for the Physic through Lego program. We have facilities/equipment for webinars, and equipment for video editing. We have a dynamic technology department that supports us and an administrative team which encourages us. We also have a number of SMART board-using teachers on staff, and have learned quickly that dedicating SMART boards in classrooms is the best way to encourage consistent and frequent use of the Interactive equipment.</p>

<p>5. Proposal indicates team member and district/administrative support with respect to:</p> <ul style="list-style-type: none"> <li>• implementing the project in classrooms,</li> <li>• supporting the professional development opportunities necessary to successfully participate in the Mini-Grant program,</li> <li>• participating in required mini-grant meetings,</li> <li>• producing the 3 minute documentary video for presentation,</li> <li>• preparing the lesson plans and materials necessary for sharing with other,</li> <li>• attending the Mini-Grant celebration day,</li> <li>• presenting the project within the district and at a regional or state venue, and</li> <li>• participating in post-project evaluations for program improvement.</li> </ul>	<p>Our Superintendent, Principal and Technology Director have participated in the formation of this grant application and are highly supportive of our participation in this project. Additionally, we as a school community understand the requirements of the Mini-Grant in general, including workshop participation, production of the documentary, attendance at Celebration Day, and presenting results to the faculty and at a state conference. Each year we have a technology night to show the community the technology projects the school has undertaken throughout the year and next year this will be the highlight of the event.</p> <p><b>Shared vision</b> for technology constructed by all the stakeholders. Our district's shared vision is: "It is the school district's responsibility to provide access to technology, training, and technical assistance support for systems operations and curriculum integration. We are committed to participation in the creation of educational technology through collaboration with communities throughout the world." This project is a reflection of our district's vision.</p> <p><b>Implementation Planning.</b> This project will involve the work of the grade 7-12 science teacher, the library media specialist, the 5<sup>th</sup> and 6<sup>th</sup> grade science teacher and the district technology coordinator, Tufts consultants and Bill Church. At some point the 4 elementary teachers will also be involved, when their classes plant their own flower, which they will be able to monitor during their science and/or technology class. There is bi-weekly time for all of the participants to meet over televideo, which will allow them to discuss the project and make adjustments where necessary before the project starts</p>
<p>6. Proposal discusses the Extent of Impact within the School – indicates the anticipated number of staff that will be directly and indirectly impacted by the project, as well as the number of students that will be directly and indirectly impacted, along with supporting explanations for each.</p>	<p>This would be our first title IID grant implementation but, our school district is committed to educating the 21<sup>st</sup> Century Student for whom mastering technology, providing alternative solutions, and implementing creative design will be essential life skills. Our team is dedicated to enabling our students to develop these skills. We understand that the trends in our culture drive the need for change and we realize the urgency for meaningful integration of these trends in our instruction. Leadership has encouraged us to become involved and we enter with eyes wide open. This project will involve 8 out of the 12 total teachers within our building and effect every elementary and middle school students and two thirds of our high school population which are enrolled in some type of science and/or technology course integrated into this project.. The systems are in place to allow for the necessary staff development; one team member has extensive experience teaching programming to the higher grades and another team member will be brainstorming with Bill Church, and Tufts University consultants on the robotics integration. Our school has been involved with Tufts programs for a number of years through their STOMP outreach program and we were chosen as an experimental site for the Physic through Lego program. We have facilities/equipment for webinars, and equipment for video editing. We have a dynamic technology department that supports us and an administrative team which encourages us. We also have a number of SMART board-using teachers on staff, and have learned quickly that dedicating SMART boards in classrooms is the best way to encourage consistent and frequent use of the Interactive equipment.</p>

<p>7. Proposal discusses the Extent of Impact to Other Schools – Describes how the project will involve or include outreach to multiple schools, or multiple districts, in order to increase the impact of the project.</p>	<p>The addition of an interactive whiteboard would be a tremendous boost to the use of technology in the science class. It would facilitate collaboration between the science teachers and special education. The tool would also give teachers the ability to prepare lessons well in advance. Using the interactive whiteboards we would have access to an extensive on-line community of educators. This on-line community offers access to an extensive library of proven methods and resources to teach students of all levels and types. This would also allow us to easily share these lessons with other educators interested in using our greenhouse link.</p> <p>The greenhouse is part of the homestead of a retired teacher who has a passion for technology and alternative fuel options. His knowledge and passion can help ignite a fire in our students that will serve them well as new technological advances carry them into adulthood providing opportunities for employment over the web despite the current lack of a business base operating from our town. We will set up several areas within the greenhouse to run controlled experiments on different growing parameters. The Robotics we are using is Lego Mindstorm NXT and have recruited Tufts University ( See Letter of Support) and Bill Church who is an educator assistant with Tufts to assist us with the all facets of implementation and training with NXT robotic and as a resource for professional development. The science classes will be able to view the greenhouse on an interactive white board and send commands back to the robots with instructions on how the different parameters should be adjusted in each area of the greenhouse. Once we have worked out the controls and monitoring glitches, we will put this up on our school website and offer it as a resource to other schools across the state. I have contacted the remainder of the schools in our SAU ( See letters of support) and also Bethlehem Elementary School who will be using this as part of their Reach Curriculum. We also plan to harvest the vegetables and serve them in our monthly senior meals that the students prepare for members of our community.</p>
<p><b>Budget (5 points)</b> Budget contains a narrative and justification of expenses regarding equipment, supplies, travel, and professional development expenses appropriate to carry out the proposed project. The total for professional development is at least 25% of the total budget requested. Include \$100 per team member for each teacher to attend the spring 2012 celebration event.</p>	

Budget is formatted with the narrative in left column and total amounts in right column. Within the narrative, proposal describes a logical connection to district goals and shows how costs were calculated. Proposal includes \$100 per teacher for attendance at celebration event.

<b>Budget</b>	<b>TOTAL</b>
<b>Purchase of the equipment is directly aligned with the SAU Technology Plan for integration of technology into the classroom to enhance student learning All digital artifacts collected through this project will be added the students digital portfolio.</b>	
<b>Hardware – 1 Interactive Projectors ( \$1,500) , 2 laptops ( \$1600) , 2 Leg NXT Kits and Probes ( \$900)</b>	<b>\$4000</b>
<b>Software Labview &amp; NXT Software</b>	<b>\$200</b>
<b>Supplies Plants and Horticulture Supplies \$500</b>	<b>\$500</b>
<b>Professional Development Activities (must be at least \$2,500)</b>	<b>\$4800</b>
Two day retreat to review and enhance curriculum for implementation of computer software and Smartboard Software 4 teachers @\$250	
Lego Robotics Programming \$1500	
White Mountain Engineering for Robotics Integration Training \$1000	
Christie McAuliffe Technology Conference ( 4 Teachers @ \$200)	
Include \$500 for your team's required participation at the Celebration Event , but do not include the \$500 on your OBM Form 1 submission.	
<b>Indirect Cost</b> (per approved 2009-10 district rates posted at <a href="http://www.ed.state.nh.us/education/data/misc.htm">http://www.ed.state.nh.us/education/data/misc.htm</a> )	
<b>TOTAL</b>	<b>\$9500</b>

**Consistent and Adequate Funding.** The school district is budgeted for new and replacement computers on a yearly basis, as well as software, hardware, and network support. We have another \$3,000 in next year's technology budget for additional equipment if required for this project

February 24, 2011

Dear Title II D Grant Review Committee;

This is a letter of support for our school and community connection project in which Students from every grade in our school will take part in this project to connect an existing "Hobby Homestead" Greenhouse to the school to answer the question: "Can technology enhance the growing capacity in the Greenhouse". To address this question the science and technology departments have developed interdisciplinary exploration projects in which students will use scientific inquiry and critical thinking skills. The biology class will design plant experiments, the chemistry class will design chemical and watering experiments and the elementary classes will plant their own plants to monitor. Once all controls and monitors are set up, this site will be available to any school interested in using this as part of their curriculum.

The greenhouse is part of the homestead of a retired teacher who has a passion for technology and alternative fuel options. His knowledge and passion can help ignite a fire in our students that will serve them well as new technological advances carry them into adulthood providing opportunities for employment over the web despite the current lack of a business base operating from our town.

Our students are very interested in robotics as well as the other technology we have been able to secure for our school. This project will help them use that technology to create sustainable agriculture using multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school. We also plan to harvest the vegetables and serve them in our monthly senior meals that the students prepare for members of our community.

Though we are a small school, with 71% of our student population on free and reduced lunch, we have a dedicated, passionate and committed teaching staff who work hard to provide our students with the best projects and opportunities they can muster.

Should you approve our grant, I can assure you that it will have my support and that of the staff here not only to implement this project with the learning goals of our own students in mind, but to share that learning with the broader community and other schools in the area.

Sincerely,  
Tonya Arnold  
Principal



Subject: Letter of Support

To: Mr. Hoyt

3. I strongly recommend the approval of this grant project for Stratford Public School. The following is a brief summary of grant's purpose.
  - d. Students from every grade in our school will take part in this project to connect an existing "Hobby Homestead" Greenhouse to the school to answer the question: "Can technology enhance the growing capacity in the Greenhouse". To address this question the science and technology departments have developed interdisciplinary exploration projects in which students will use scientific inquiry and critical thinking skills. The biology class will design plant experiments, the chemistry class will design chemical and watering experiments and the elementary classes will plant their own plants to monitor. Once all controls and monitors are set up, this site will be available to any school interested in using this as part of their curriculum.
  - e. The main feature of this project is a 50 x 20 Greenhouse at the home of a retired computer teacher. This teacher and I feel that the computer controls we can set up would be a controlled area that would give students an advantage unavailable elsewhere in the North Country. Our students have done poorly in the Science NECAPs and the hands on experimentation would help substantiate many science principles in biology and chemistry.
  - f. Students will have direct contact with the greenhouse from the school; there will be multiple robots and sensors to collect, light intensity, humidity, air and soil temperatures and other parameters. The students will be able to remotely see all the areas of the greenhouse and run their experiments remotely from school.
4. I believe this project is truly a "one of a kind" and will involve the students in real world applied technology. I strongly request grant approval for this project.

James D. Shallow  
Superintendent

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# *Groveton Elementary School*

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36 Church St.  
Groveton, New Hampshire 03582-1399  
[www.sau58.org](http://www.sau58.org)

Voice: (603) 636-1806

February 25, 2011

## **Title IID Letter of Support**

This is a letter in support for the Stratford Title II D grant Proposal based on the question, **"Can technology enhance the growing capacity in the Greenhouse"**.

This project will enhance our science curriculum in that Biology students will use scientific inquiry and critical thinking skills in the design and implementation of horticulture experiments controlling such variables as heat, light and moisture. The chemistry class will design chemical and watering experiments. Classes will also have the ability to set up time lapse photography on plants of their choosing.

The main feature of this project is a 50 x 20 Greenhouse at the home of a retired computer teacher. Links on our SAU 58 website will grant access to live video feeds and a direct link to control the robotics set up within the greenhouse that monitor and maintain required growing parameters to be used in the classroom curriculum.

Signed,

Rosanna T. Moran  
Principal

Chris Rogers  
Dept. Mech. Eng  
Tufts University  
Medford, MA 02155  
[crogers@tufts.edu](mailto:crogers@tufts.edu)

2/28/11

The Tufts Center for Engineering Education and Outreach is pleased to support the Stratford Public School Greenhouse Project. Tufts has been a leader in the push to include engineering in the K-12 classroom in Massachusetts and beyond and is well positioned to assist teachers in an innovative, hands-on environment such as this. We look forward to collaborating with your team of teachers and students involved in this cool Project .

Sincerely,  
Chris Rogers  
Director, Center for Engineering Education & Outreach  
Professor, Mechanical Engineering  
[crogers@tufts.edu](mailto:crogers@tufts.edu)