Bentley Award Application #1

Our project involves what is sometimes known as “flipping the classroom”. 'Lectures' are recorded as Vodcasts which students can access anywhere/anytime. This frees up class time for more engaging pursuits in which teachers can help students with their own thinking. In the chemistry classes at ABC High School, that are currently being flipped, students are given all course materials for each unit. They can then work at their own pace, allowing students to be in charge of their own learning. The project we are proposing is growing this model beyond the chemistry classroom to other sciences, and other subjects. Discussions have begun within the science department and beyond. The Bentley Award could help by allowing the purchase of computers and software to set up a recording studio. Ipads would allow students to view lectures within class, should they not have their netbook.

This project is innovative because this restructuring creates a system built around mastery learning within which students are encouraged to become independent learners. We believe students learn best when they are challenged at an appropriate level. Too much challenge and students often become overwhelmed. In a traditional classroom all students move on to the next unit together. Often that means some students are ready to move on but some are not. The students that are not ready fall behind and become less engaged in their learning. Too little challenge leads students to boredom. Neither of these situations support learning. This restructuring of our classes allows students to move at their own pace. No longer is a student held back because the class is moving too slow for them. Flipping the classroom allows us to prepare more units than are normally taught. Motivated students can achieve in ways that they couldn't otherwise. Flipping the classroom also allows students who are out of school because of illness, family emergencies, leadership retreats, and athletic events to minimize the impact of being out of school. Flipping the classroom allows us to differentiate by providing students with an appropriate challenge. We also believe that schools should prepare students to be life-long independent learners. This class format gives students a chance to practice being a self-directed learner in a supported environment. Our experiences have shown that students are much more involved in their learning when they are in control and the teacher assumes the role of coach. Our project is innovative because it allows us to organize our classroom around mastery learning. In mastery learning students do not move on to the next unit until they have mastered the current one. This ensures that students are ready for the material and concepts they are tackling. We believe students are more successful when the expectation is that all students will master the material. We believe our project encourages students to explore STEAM. We are excited about this project as we believe it has the potential to dramatically increase student interest and motivation. We believe this project is innovative because it allows our students to be independent which is, after all, one of the great strengths of adolescents.

Bentley Award Application #2

Geocaching is an adventure game for GPS users. As Summer Navigators, students will set up caches all over their community and then share these locations on the internet. They will learn to use GPS technology and will further document their travels using iPads and digital cameras. In this way, students will explore the rich historical and natural resources of their hometowns--old cellar holes, cemeteries, hiking trails, riverbanks, farms and more. They will in turn have the opportunity to share their learning through links on the website of The ABC Inn. As visitors explore the town on their own search for the caches, the students will become important partners in the business community of their hometown.

The Summer Navigators program will run as an important component of our summer school program that will include academic support in the morning, nutrition through the Federal Summer Food Program, and arts, physical fitness, and science activities in the afternoons. Through a combination of these three components: academics, good nutrition, and enrichment, our goal is to provide our children with the kind of rich summer camp experience many of them would not otherwise access.

The Summer Navigators program is a wonderful opportunity for students to integrate technology with explorations of the natural world while also participating in a team building activity. For many of the students in ABC and XYZ too much of their summer is spent inside: recreational opportunities are few and neighbors are often miles away. This geo-caching activity brings students together in a way that allows them to extend their learning well beyond the school year and the walls of the classroom, building their academic skills and perhaps their motivation to pursue their interests in science and technology beyond high school. The addition of iPads and cameras to the project, and the opportunity to publish on the web, adds a creative dimension to the activity as well.

Geo-caching in ABC will include a unique partnership with The Nature Museum at ABC. Expeditions to find or establish caches will be led by naturalists who are knowledgeable about the rich geological and biological diversity of the area. It is exciting to consider the possibilities of bringing an iPad into the field--not just for its navigational potential, but also for the opportunity to record data through photographs and sound, and to do on-the-spot research as students make discoveries along the trail.

Finding and solving the problem of where to locate a cache actively engages students in interdisciplinary, collaborative, open-ended and challenging problems that are meaningful to them. Students can build their independent thinking skills and learn from one another. As we think about the kinds of workplaces that promote creativity and innovation, we know that these are the kinds of experiences we need students to have to be successful employees. The Summer Navigators program is unique in its focus on collaborative problem-solving that uses technology to both connect students to the world and enable them to navigate the path that is literally under their feet.

The Summer Navigators program incorporates not only teaching students how to use technology, but the integration of these tools into an in depth exploration of the natural world--all this with the authentic goal of sharing that exploration with visitors to ABC who access their geo-caches through the internet. It will be exciting for our students to know that they are contributing to the Town's economy in such a unique and meaningful way.

Bentley Award Application #3

ABC School would like to launch an interdisciplinary study of weather in grades K – 8 and is looking for assistance to support this project. As part of a recent renovation of our science laboratory, ABC School installed a weather station on the school roof which is certified by the National Oceanic and Atmospheric Administration (NOAA). Our middle school, grades 5 – 8, has already incorporated weather station data into the science curriculum. We would like to expand our weather data capabilities to include more outdoor observations, measurements and data collection and expand this curriculum to our elementary school, grades K - 4. These capabilities would be integrated into lessons in science, language arts, math, social studies, and art. The ability to incorporate weather phenomena into a lesson plan will provide many opportunities for authentic learning and will engage students in purposeful projects that call for reflection and communication.

Weather is an ideal topic for students of all ages to innovatively explore STEAM because with the right tools, it can easily be analyzed, understood and studied. Using weather data, students can use technology to learn scientific practices such as asking questions and gathering data; mathematic practices such as analyzing and interpreting data; and engineering practices such as constructing explanations and designing solutions for gaining answers. In addition, social studies can be integrated as the data can be analyzed and compared to other regions to help children better understand the world we live in. ABC School's faculty-developed Integrated Arts Initiative can provide students many opportunities to express their creativity across all curricular disciplines. Students can creatively articulate their weather observations and analysis through poetry, creative writing, photography, drawing, music, drama and other forms of artistic expression.

Increasing our capabilities to incorporate more technology into our weather program would support our initiative for incorporating 21st Century Skills into the curriculum. iPads could be used for in-the- field data collection and analysis, photography, and art. Temperature probes can be purchased as an iPad accessory and could be used to measure discrete temperatures of objects and locations to further facilitate analysis. Other applications and accessories could be purchased to support this initiative including portable wind meters and soil moisture content probes. Providing these tools to go beyond simple air temperature and wind measurements will give our students a deeper understanding of the incredible impact of the weather on our society and world.

By tapping into a child's natural curiosity about the weather, because it is relevant to their life, we can stimulate a child's interest in STEAM. Starting young is the key – that is why we want to expand the program to children as young as Kindergarten. To make this project reality, we need additional resources. We are a private ABC school that is discovering personal greatness in children of all faiths. The cost of tuition does not cover the expense of educating each child. We rely on the generosity of our parents, alumni and our community to help us fill this gap and to fund special projects such as this one. We already have the weather station, we're already sharing this data with the world, we need the resources to innovatively expand the use of this tool and expand 21st Century Skills with our students.

Bentley Award Application #4

I teach design and technology education in grades 9-12. I am fortunate that I actually teach six different courses each year, which mean on any given day each of my classes have completely different content. My tech systems I and II students I do a variety of projects that investigate the following four areas of technology: communications, manufacturing, transportation, and construction over a year and a half time span. The activities have an integrated approach to STEM. Some examples of these hands-on activities include building balsa structures, rocketry, magnetic levitation vehicles, rubber band powered airplanes, electric terrain vehicles, computer-aided design, and Photoshop collages.

I would like to expand on these STEM units by incorporating more digital media into their learning. For instance, I could have the students create podcasts or videocasts about their projects describing their design process. This would expose students with videography and photography as they document their project through each stage. When the project is complete, students could then explore editing software and add voiceovers or digital storytelling to discuss their learning. Or, students could also upload images to a class blog which could become a forum for peer feedback.

Our youth are far more advanced with technology they we most likely were at their age. The evolution of technology is moving at such a fast pace is difficult to keep up. One area that I strongly feel is a gap in our educational system is teaching about appropriate and safe use of this technology. The activities I have described would also create natural teaching moments about appropriate use of technology or what some refer to as netiquette.

I feel the above activities will not only allow my students to use technology in an appropriate fashion, but it will also even the playing field. For many of my students, their ability to share what they have learned is limited by their language, and we as teachers so often require a written response. Through the use of visual arts they now can express and demonstrate their learning without the stress of this obstacle.

I attended Bentley's art exhibit at Champlain Elementary during the 2011 Art Hop. While his artistic talent was certainly impressive, what caught my eye was how well he expressed his view of the world at such a young age. I would like to provide my students more opportunities to express how they view the world in a creative and captivating manner.

To include these activities into the curriculum I would need certain supplies that I don't currently have or have enough of to supply my students. Such as digital cameras, video cameras or flip videos, headphones with microphones. The Bentley Award would surely enable these ideas to become a reality within my classroom.

Bentley Award Application #5

Currently fourth grade science students have the opportunity to study the habitat and life cycles of different animals. Throughout the year the focus is on: dwarf frogs, fiddler crabs, worms and ducks.

We would like to expand this project into a 2 year study which would follow the students into fifth grade. The following would parallel what is currently happening in fourth grade:

- Maintain a classroom compost container
- Calculate moisture content of compost ingredients
- Develop a maintenance schedule for aeration, hydration and temperature management of container
- Consistent temperature and humidity control within the incubator
- Promote collaboration between fourth and fifth grade science students

This project will allow students to become more responsible for their study. Students will be able to maintain and share results when using equipment not currently available to them. This award will allow the purchase of the following: data loggers, sensors, graphing and analysis software, temperature probes and a new incubator with humidity and temperature management accessories.

Students will:

- Collect, interpret, analyze and graph data
- Develop a multimedia project which will document and enhance student work utilizing but not limited to: flip videos, journals, pod casts and photo journals.
- Share new learning across grade levels –presenting to other classrooms PK-3
- Promote the opportunity given by presenting information to media and community.

Bentley Award Application #6

ABC High School & Middle School places great emphasis on providing Science, Technology, Engineering and Mathematics opportunities to our students. Beginning in the middle school (grades 6-8), students are encouraged to challenge themselves with advanced coursework in math and science through our honors and accelerated programs. Our most recent addition is the ABC Middle School Robotics program where students work together to design, program and build robots. Beginning this past January, 14 students meet after school with ABC Science Teacher Karen S. With support from local plastics manufacturer Mack Molding Inc., the robotics program was able to secure initial start-up costs for materials and equipment that had not been budgeted for the mid-year addition. The Robotics students have decided to enter the Botball Education Robotics annual competition later this spring and have been working on software design, mechanical design and developing an overall project plan for the competition.

The newly formed after-school Robotics program at ABC Middle School is a great example of "build it, and they will come." Last fall, Arlington Science Teacher Karen S sent a letter home to families announcing the Robotics program. Soon there were 14 students signed up eager to begin. Some of these students previously excelled in science and math, others thought learning more about robotics engineering and design would be fun—all were welcome to participate and add to the learning process.

Through this hands-on approach to learning, Mrs. S is easily able to integrate science, technology, engineering, creativity and math into every session. The project is 100 percent inquiry driven from the students, so they must be creative in the building process, as they link the abstract to the concrete. The robotics program is engaging for students who thrive on experiential learning across the multi-disciplines—monitoring software design to conception, applying theories of math to motor angles and speed efficiency and utilizing numerous elements of engineering. The students learn computer programming, develop problem-solving skills and gain technological knowledge. Since this is an after-school activity, students are involved because they want to be—there is no academic pressure, just a strong desire to meet the challenge.

Through this program, we have learned that Robotics education is an innovative pedagogy allowing students in our small public school to think beyond the every-day classroom experience. They, literally, have to turn their creativity into a four-dimensional reality that operates as designed. Students are respectful of others' ideas as they critically group-think their way through challenges. They have to work as a team to collaboratively solve their problems; and where grades and classes may have separated these students before the Robotic program, now there is mutual respect of intellect, ability and creativity.

ABC Robotics students will travel to Lowell, Massachusetts, for the Botball Educational Robotics competition to face 22 teams in the New England region. There they will meet with judges to explain the successes, failures and challenges they experienced along the way. Judges will want to know a variety of information including why the students chose their robotic design and which designs they ultimately rejected. Costs associated with the competition are approximately $3,200.

Bentley Award Application #7

ABC School is a grades K–2 school in an increasingly impoverished and largely rural community in northern Vermont. We are gradually implementing iPads into our classroom environments in order to further promote and diversify our students' learning. Numerous studies have demonstrated that implementing student-centered, technology-rich learning programs into academics is highly beneficial, particularly for students with disabilities. Part of ABC School's overarching strategy is to utilize assistive iPad technology for our students with social and emotional disabilities.

ABC School's iPad inventory, however, is insufficient; we currently have far fewer iPads than we have students—particularly those students for whom studies indicate the iPads would be of greatest benefit. Please consider partnering with us so that we may augment our limited iPad inventory in order to facilitate learning and exploration of STEAM curriculum for our students.

Combining technology with excellent instruction results in a synergistic capacity to engage our learners and excite them about their study, particularly in the areas of math and science. The iPad possesses a number of effective applications that have been designed specifically to enhance STEAM-related student engagement for our students' specific age group, including but not limited to Addition UnderSea Adventures, Alice & Andy in the Universe of Wonders, Brain Pop, CountBy, Mad Math Lite, Piggy HD Math, Princess Math, RedFish 4 Kids, Star Walk, Tens Frame, and Whizzit 123. With expressed regard to students with social and emotional disabilities, so very often, the writing process—and therefore the written demonstration of acquired science and math knowledge—becomes a nearly insurmountable challenge. By leveraging a number of acclaimed iPad applications, we can assist this student demographic in overcoming these challenges, helping them instead to thrive in areas in which they may otherwise continue to struggle.

Another significant advantage in using iPad applications for students with social and emotional disabilities is the mobility factor; when a student becomes frustrated in one educational environment, he or she can easily relocate to one that is less stressful while still having the benefit of this mobile technology to support and reinforce his or her learning.

In addition, studies have repeatedly shown that low-income students struggle academically much more than their non-low-income peers. ABC School's low-income student population has been steadily increasing; its current low-income population stands at 38.21 percent and rising. Availing additional technological resources that would be otherwise unavailable to this population will significantly improve their likelihood of academic success.

Augmenting ABC School's iPad inventory will provide supplemental support for not only these target groups' acquisition and demonstration of STEAM-related knowledge but also for all of our students.

We thank you for your consideration of our proposal!

Bentley Award Application #8

The Science Fair at ABC School involves all students in grades 4 through 8. I have overseen the Science Fair since its inception in 2001. During that time the faculty has worked to improve and fine tune the approach to the Science Fair to ensure the work is student-driven and the "playing field" is as level as possible for all participants. The criteria for projects is geared to each class level, with 4th graders doing fairly straight forward research projects and presentations while older students are challenged to do increasingly complex and creative experiments and scientific analysis. The process begins in December and is completed in March when students submit their written reports and present their projects orally to judges, using their display boards and any visual aids from their experiments. Top scorers from 7th and 8th grade present their projects at the state Science Fair.

Our Science Fair is particularly innovative in calling upon our students to use all elements of STEAM. Every year, to my delight, there is at least one student "surprise." This is the student who might not be the best mathematician, artist or writer in the classroom, but excels when asked to tackle a project of their own choosing and present it in their own way.

Science Fair introduces students to the scientific method. Younger students research their topic, write a paper, prepare a display highlighting key information and present this information. Older students engage in all aspects of the scientific method: they must ask a question, do background research, construct a hypothesis, test their hypothesis through an experiment, analyze their data, draw a conclusion and communicate the results.

Many experiments require engineering skills. Technology is used in research and in many experiments. Students use graphs and charts to explain results. Math skills are a must. Conveying information is a critical component. Creating an effective display board means presenting the knowledge they've acquired in an artistic, eye-catching manner. The presentation to judges teaches students how to pass the knowledge they have acquired on to others.

My challenge is ensuring that each student has the resources he or she needs to successfully complete his or her project. This is why this grant would mean so much.

Our students are from 18 different towns and very diverse backgrounds. Twenty percent qualify for free and reduced lunch. I have been to science fairs where it is clear that some students have amazing resources. It is easier to present a dazzling project if a parent has access to university labs, for example, than if a parent has few resources. In an early science fair here, students were told to purchase a display board for their project. On the day of presentations, one student of limited means arrived with a piece of cardboard cut from a box. I was dismayed. I hadn't realized that even the cost of a display board is daunting for some.

We are committed to removing barriers for our students -- from something as simple as providing boards for needier students, to upgrading our lab and making resources available to encourage our students' creativity.

Our budget is tight. We do what we can through donations. To have $3,000 for Science Fair resources, plus the iPads and technical support, would be invaluable.

Bentley Award Application #9

ABC High School recently created a student organization focusing upon sustainability, modeling it after the international organization Net Impact (http://netimpact.org/). This cutting-edge student organization aims to create sustainability-centric learning opportunities for its participants in order to inspire and revolutionize their study, knowledge, and direct application of STEAM for the benefit of their collective futures. ABC High School is pioneering the implementation of an organization of this type on a secondary education scale; it is the first organization of its kind in the nation on a high school level.

ABC High School's computer inventory, however, has a number of limitations. Please consider partnering with us so that we may purchase laptop computers to help facilitate research and exploration through this ongoing STEAM-oriented sustainability organization.

ABC High School is the first high school in Vermont to initiate a project of this nature. As part of their exploration into sustainability, our students will research and investigate the role of science —including earth and physical sciences— in creating safeguards for our fragile ecology. This ongoing research and investigation will encourage our students' development as scientists as they endeavor to identify, formulate, and implement viable solutions to our global environmental challenges, particularly in the further development of renewable energy sources. Furthermore, this project will encourage our students to explore STEAM by introducing them to sustainability-related careers, such as environmentally conscious architecture, energy conservation auditing, wind turbine installation and maintenance, solar power, and a host of other similar options in this vast field. Because the global clean-tech market is anticipated to propagate to more than two trillion dollars before the end of the decade, this initiative is particularly important to our student scientists because it provides direction in one of the sectors with the most promising employment projections.

Access to additional laptops will provide supplemental support for the group's research and subsequent work in sustainability and renewable energy sources. Supporting these endeavors will encourage disciplined study and practical application of STEAM as well as increased environmental stewardship, and it will encourage our students to pursue careers in the sciences.

We thank you for your consideration of our proposal! We are available at your convenience for any questions you may have.

Bentley Award Application #10

This project would incorporate the use of iPads to make a video of our town to share with pen-pals in Germany, Italy and France. Working in collaborative groups students would decide what is important in our town to share with peers around the world. Using the iPad, students would shoot video clips, record audio, and take pictures of the different aspects of our town. They also would use the iPad to view articles and newspapers from their pen-pals' country to be able to make comparisons of the different life-styles. They would also have the opportunity to communicate through Skype, email, and blogs. Using their collected media, data, pictures, and video they would collaboratively create a dynamic movie that gives their pen-pals the opportunity to see what life is like in ABC.

This project is innovative because it engages students in a real-world, project-based learning. Students are given the opportunity to work in collaborative teams, using 21st Century skills to create a high-quality product that will then be shared with students from around the world. The iPad will be the primary tool to collect media and data, design and create the video, and share with their pen-pals. The iPads will allow students to collaborate, access information instantaneously, investigate, and question, helping them make connections between school, community, and the world.

This trans-disciplinary project engages students in a variety of STEAM disciplines. Students will be asked to investigate, gather and organize data, and draw conclusions. They will then have to design and create a video that demonstrates their collective learning. This authentic learning opportunity asks students to explain, interpret, apply, and shift perspective from their own to others around the world. The project encourages students to think critically, develop their own creative voice, and work together as a collective, thereby creating an effortless melding of science, technology, engineering, art, and mathematics.

Bentley Award Application #11

The teachers of Physics, Industrial Technology and CAD are working together to integrate the computer design, physics-engineering and final fabrication of several projects. These will include a low cost pellet stove for heating, wooden truss structures fabricated with a computer controlled router, sports equipment, and other projects generated by the students.

The three disciplines are often taught in isolation. By integrating them to produce tangible student projects using computer modeling, graphic design and finally computer controlled fabrication. We are going to start by redesigning a pellet stove to be simpler in design and less expensive. One goal is to make and compare a non electrical pellet stove, one that has minimal electrical controls, and one that has a battery and inverter back up. Thus we will be engaging the students in innovative new technology. These projects will all require scientific analysis in the design process, the technology of both materials and components, the evaluation of power inputs, b.t.u. out puts and fuel efficiency. The mathematical modeling of the design goals will be compared with the actual peak power and efficiency. The projects will all be designed on Key Creator software and then fabricated. Good design is inherently aesthetic and elegant.

We are in great need. Our school is cutting $350,000 from a level funded budget. Your support would help us engage our students in real world creative design work.

Bentley Award Application #12

In 2011 I was a coach of a team of 10 students between the ages of 10 and 14 who worked to compete in the First Lego League Competition.

In this challenge, the students are given a limited amount of time to hone in on a real world issue, research possible solutions, and design a prototype that will provide a practical remedy to the problem. They also share their discoveries and their core values through public presentations, a song/dance, and a skit.

In addition to these aspects of the project, the students build and program a robot that can accomplish a variety of missions related to the overarching theme. We received the award for "Best Overall Team" at our first competition at Dartmouth and we won the "Best Rookie Team" award at the next level of competition in Manchester New Hampshire.

Our project is innovative in a number of ways. Although 55 countries in the world have teams who embrace this challenge, it was an entirely new experience for both the coaches and the students at our school last year. The learning curve was steep, to say the least and the students became passionate about every facet of the challenge. Our team was given an overarching theme and within that framework they created their own unique and innovative approaches to all challenges. I hope we can continue this unique learning opportunity this year. The robotics portion of the contest requires the students to use their math, technological, and engineering skills. When they design their robot they need to consider wheel size, rotation, angles, and speed. Once a robot is built the trial and error of programming the missions begins. The programming is done on a computer and then synced to the robot. Students spend hours taking measurements and tweaking their programs as they try to get their robot to successfully complete many missions. Another aspect of the challenge involves the students researching a real world problem that relates to the overarching theme of the competition. Last year, team members used the internet and interviews with scientists to determine the problem they would tackle. Then they came up with a solution, built a prototype and wrote and performed a skit as a way to share their learning. Their skit even included costumes, songs, and a few dance moves! The students who were part of our Dynamic Designers team were incredibly enthusiastic and creative throughout our months together. They worked as a team to overcome obstacles and to creatively find solutions. We now have 11 year old students talking about attending MIT in the future!

Although the coaches volunteered all their time, it was still an expensive endeavor. We would love to continue to offer this learning opportunity this year and the Bentley Award would make it possible for more students to get hands-on experience simultaneously.

Bentley Award Application #13

I teach 6th grade science to 54 students split into two classes. In one of our curriculum units we study the solar system. Some of the main grade level expectations that students learn are phases of the moon, lunar and solar eclipses, as well as how scientists use telescopes to learn about objects that are a long distance away. I try to bring as much hands on exploration into every science topic that we cover. In order to cover these topics, and make them hands on, I use flashlights (the sun) and various Styrofoam balls to represent the earth and moon. In doing this the children work to recreate various moon phases as well as the eclipses. This strategy has worked well in most respects. However, I feel that with I-pads I could add so many more activities to make this unit really bring outer space into our classroom.

I think that new technology could add to all of our science units. As we study chemical reactions, geology, and the human body I think there are an amazing number of opportunities to bring science together with technology. As I mentioned earlier, I strive to really make science as hands on a possible. I come up with many interactive labs. Everything from conducting a chemical reaction in a zip lock bag so that we can measure the amount of gas given off when the reaction takes place, to dissecting cow hearts to view the heart chambers and valves. By far my biggest struggle is creating ways to actively teach about the solar system.

When I think about the ability to have I-pads for my students to use when learning about the solar system, I have multiple ideas that I would love to be able to put into action. There are apps for I-pads that will allow them to explore the solar system as if they are looking through a telescope. The I-pad apps will even tell the children what they are identifying. There are online activities that will allow for my students to actually simulate a flight through the solar system. The higher level thinking skills that are put into place when students are able to really put themselves into situational activities is amazing.

We could utilize Skype and connect with a local astronomer. Often children are so inquisitive with their questions that they can surpass my range of expertise on things. It is so wonderful for them to get concepts reinforced and further explained with the chance to interview an expert in the field.

I could also still recreate the moon phases with the Styrofoam balls and extend it by having the kids make it into a documentary type video, or a music video, or create a news broad cast. We could then utilize our school's new voice thread account and share it and comment on each others.

I think there are so many possibilities that are available with the right technology to really bring the universe into the classroom. Kids respond so well so being able to see and do things as they learn about how our world works.

Bentley Award Application #14

My 5th grade science classes study the ecology of the LaPlatte river and the Champlain Basin each year. We would like to log data digitally and capture images and video of our studies. We track the relative cleanliness of the river behind the school and other locations though performing a benthic macrobiotic index on a regular basis in the unit. This unit increases students' awareness of the interdependence of the ecosystems within the Champlain Basin and specifically gets them focused on the river that has its source in their town, flowing through Shelburne and into Shelburne Bay into the Lake.

The project is innovative because it will introduce the use of Ipads as tools in field science to elementary age students, thereby linking stewardship of nature with technology tools which are increasingly a part of their daily lives. By having technological tools that are easy to use in the field, science students can immediately record data and images and learn to manage, analyze, and predict as they are working. I have been doing this work for at least a decade but have never had the opportunity to integrate technology the way it might be used with these tools. I am still too unfamiliar with the Ipad myself to be much more specific at this time. I can only imagine that countless images of flora and fauna along the LaPlatte could be recorded and added to the records which already exist. The real innovative and creative aspect of these tools will become apparent once these toolss get into the hands of the students and are used in purposeful directions of investigation. It's the "not completely knowing" where all this will lead that is exciting.

Bentley Award Application #15

15 years ago ABC Middle School was formed when the X and Y schools combined to form one K-4 school, and one 5-8 school. At that time, a wooden shack used for various purposes was brought over from the X School. That shack sits on the banks of the ABC Brook, and the Quest Team, lead by Melissa W, has proposed that we renovate this shack to create an outdoor classroom and attached greenhouse. ABC Middle School does have outdoor gardens, and we have just started composting on a school-wide basis. We have ample green space around our school, with state and protected land on the far side of the Crossett Book where there are trails and great wilderness areas to explore. The proposed outdoor classroom would be an excellent jumping off point for all of these outdoor areas.

Melissa W has been affiliated with the KIDS Consortium for a number of years, and she is very active in providing Service Learning and STEM opportunities to ABC Middle School students. The idea for this particular project arose from the Quest Team students themselves as a result of a group brainstorm on what "real-world" problems exist around us that we can solve. Studying the natural areas around us is the goal, with easy access to the natural environment the problem, and the outdoor classroom will provide access to the environment that we currently do not have. Melissa W has acted as a "guide on the side" as the students have brainstormed ideas, researched outdoor classrooms, and met with our building and maintenance staff in order to glean their thoughts on this project. Ideas for the outdoor classroom have ranged from flower boxes on the windows, to solar panels on the roof, from a retractable whiteboard coming down from the ceiling, to benches that collapse into the wall in order to create more flexible learning space. Rough plans have been drawn up by the students, but the project is still very much in the infancy stage. When completed, the outdoor classroom will be accessible to all of our 280+ students, and will truly enlarge our "learning space" by an immeasurable amount. A boost such as the Bentley Award would without question allow this project to come to completion much sooner than originally expected, and would prove to be a major boost in our abilities to "look beyond the four walls" of our classrooms. Thanks in advance for your consideration.

Bentley Award Application #16

Inquiry based science taps into students' curiosity and natural affinity for the natural world. In the elementary school, educators need to provide the equipment, print resources and opportunities to investigate these worlds in as authentic a manner as possible. Students who are engaged with these materials in an authentic context learn to read, write and think critically as well as gain knowledge of science topics. Our project seeks to engage students in Grades K - 4 with science topics that enables them to question, observe, read, write and manipulate materials under study that leads to increased understanding of science content and the scientific methods of inquiry.

For many years it was believed that young children were not capable of thinking critically or learning “real science” content. Research in the last ten years has shown that young children are in fact able to reason and think critically in many areas of the school curriculum, including science. Young students are highly motivated for example, to read nonfiction or "true fact" books and typically want to know more about what they have read. Teachers are being asked to incorporate strategic questioning techniques during lessons that supports acquisition of these critical thinking skills (e.g. "thinking beyond the text") and leading students to consider deeper and broader aspects of the topic they have just learned about. IN addition, schools are exploring responsible ways to incorporate technology use in classrooms in order for students to access the greater world; science is one area where students are enabled to have authentic access/experience (instead of being talked to by the teacher) with topics that they would not necessarily have access to in a typical school enviroment. For example, through a small local grant we have purchased digital mircroscopes for our primary classrooms (K -2) as seed equipment for the Science Inquiry Project for the school. These microscopes will be used by students 1:1 with classroom computers as well as in whole group lesson formats with interactive white board equipment. Inquiry based activities can thus be taught by the teachers to the whole class and then students are able to learn to manipulate the materials and conduct deeper investigations and discuss their findings with peers. Incorporating mathematics and applying math concepts during science work is a mutually beneficial and very effective teaching/ learning approach. Reading and writing in the science content area must also be incorporated to embed all of the learning in long term memory for young children. Our school has the benefit of having access to a math and science curriculum coach who supports teachers' innovative approaches to improving student learning across the curriculum through the lenses of science and math. Teachers at ABC are anxious to have the resources they need to make the Science Inquiry Project a success for all students.

Bentley Award Application #17

My project is "The Benefits of Technology in Kindergarten". It is focused on the positive benefits of technology in early education, with an emphasis on how it allows children to enhance their capacity to learn while developing into safe, responsible, technology-savvy digital citizens Kindergarten life is exciting, engaging, interactive and changes rapidly. Technology, when used right, is a great tool to keep up with our fast changing world and enhance classroom learning. Podcasting, video, SmartBoards and iPads are all wonderful technological tools that inspire young children to think deeply about their ideas while also allowing important collaboration with others. This grant would provide my class with interactive tools that would give children opportunities to share their learning in a fun and meaningful way. Technology also provides an easy way for children to share with their families and others in the world about "how", "why" and "what" they are learning.

My project is innovative because it allows me to leverage a vast amount of technology tools that allow children to bring thinking and learning to life! As an early adopter of technology, I've discovered many opportunities for children to be creative by designing learning situations using a variety of technologies. This promotes a climate and culture of sharing and interaction and allows me to introduce to parents what is available and how it impacts their child's learning. Here are some tangible examples of how I take advantage of technology to strengthen my teaching and further my students learning opportunities: Video captures oral language and children's creativity. It demonstrates critical thinking, which can then be played back to them so they can talk about what they see and hear. Video allows me to spotlight and validate the experience the children had making them feel supported and recognized for their efforts.

A digital camera is invaluable. Photos are shared in numerous ways: posted on a class blog, a wiki or a slideshow. Children can also create their own post on their kidblog or create a podcast about what they did.

Through Voicethread I create and design slides reflecting mathematical concepts which allow children to make observations about and interact with. This web tool allows them to practice critical thinking and articulate their learning. Their excitement to share their ideas and facilitate questions and comments from others promotes interactivity.

Podcasting another wonderful tool to capture children's thinking. I often ask them to explain what they learned and how they learned it which requires them to explain their reasoning. This promotes changing their thinking which leads them to learn that there are multiple right answers. Later I photograph what the child has created (a drawing or physical object representations of the subject we are learning about) and I pair it up w/their voice to in the post.

iPads double up as a digital video/camera that allows me to instantaneously email what is being captured during class time, as well as provide a myriad of opportunities via either educational applications or iBooks.

I incorporate one or a combination of the technologies illustrated above throughout the school day whether it is during science, math, writers or art workshops. I hope I demonstrated my belief and commitment in technology's power to positively impact the students learning experience, and that you find my application worthy of the grant.

Bentley Award Application #18

Our vision is to set up an online “RES Academy” of student-created teaching videos and other learning materials on STEAM topics, so that other students and their families can use them in school and at home. There is no funding in our very limited school technology budget for this project, and so far we have been using only free resources. We have been challenged by the limitations of these resources; for instance, our current free wiki website won't accept video files above a certain size. We would use the funding from the Bentley Award for website hosting of the RES Academy; video conversion software so that all the videos on our site would be in the same format; styluses and other accessories for the iPads; and digital projectors so that students could see and use the videos in their classrooms. We would use the iPads themselves for creating and editing videos.

Students have already been exploring many aspects of STEAM through this project. For instance, they have designed several different possible logos and layouts for the RES Academy website. They have scripted and recorded Kahn Academy-style teaching videos about math topics on the school's single SmartBoard. They have also used digital cameras and iPods to film each other playing math games and explaining how the games work. We would like to expand the project so that students would also create science videos and other materials.

We feel the RES Academy project is innovative because it has given our students an opportunity to deepen their own knowledge of STEAM topics while also designing and creating STEAM learning experiences for other students. As they have found, they need a deep understanding of their math topics in order to make videos that make sense. As we add more topics to the Academy website, we hope that students will continue to find new ways to share their knowledge and teach their peers. We also hope the RES Academy can serve as a model for other schools that may be considering similar projects.

If you would like any further information, please contact Beth R at her email address Thank you very much for your consideration of our project for the Bentley Award.

Bentley Award Application #19

Our small school in the islands of Lake Champlain is working on an amazing place based science program. We are currently studying the area around our school in conjunction with Lake Champlain land trust and Exordium science. We are working on a garden with native plant species, animal/ insect studies of the islands as well as a Lake Champlain watershed project in connection with 3 other schools.

Our project is innovative because it combines a study of local biomes with a technology component. The students go out and study local land forms, animals, plants or insects and then catalogue their information on a WIKI. This WIKI is shared with students in Sheldon, Alburgh and a local home school consortium. Additionally, students are making connections with local people and advisors. They are interviewing local residents to get an understanding on how the area has changed through the eyes of local people. These interviews will also be available online. This is an innovative project that involves science, technology and a "people" connection. I am very proud of the work that has been done so far and I would like to continue this project with help from this grant.

Bentley Award Application #20

My name is Sharon W and I teach reading to struggling readers at ABC High School. Students that I work with read below grade level which impacts their ability to succeed in school. My project is to be able to purchase 15 electronic readers (price range $99 - $149 each for a total of $1485 to $2235) for my classroom. The price differential denotes the difference between a black and white e-reader (such as a Nook from Barnes and Noble) to a color e-reader. The rationale in bringing in e-readers is to give my students a new and different way to read. E-readers have certain functions that are beneficial such as: the ability to get the definition of a word at a touch, the ability to "talk" to one another electronically,the ability to store many books on a single device, and to read at a comfortable font size and with a lighted background.

My project is innovative because it brings in the next type of book - the e-book to the classroom. I am not personally convinced that I will ever give up a paperback to go to an e-book, but if I can hook students who don't find reading pleasurable with an electronic device, then I will feel that I have done my job. I have heard of classrooms using e-readers over the summer with their students to encourage recreational reading. I believe that e-readers for struggling readers will encourage students to explore STEAM in a positive and alternative form and my hope is that this form of technology will motivate kids to explore and read more.

I am happy to discuss my project in more detail with you at any time and can be reached at my email address or my cell phone.

Thank you for your consideration.

Sharon W. Reading Teacher

Bentley Award Application #21

Each year at Aurora School, we have been selecting various science challenges. Last year, we participated in the NASA WLMR challenge where students designed a water recycling system to work on the moon. This year were are participating in the Kids Science Challenge Meals on Mars challenge where students improve upon existing technologies to develop ways to provide, prepare and grow food on Mars. The contests involve hands-on engineering as well as research and presentation as students work in teams to come up with real solutions to contemporary problems. They research the facts already known, think of a new idea, test it out, analyze the results, come up with a new idea, test it out and keep working until they run out of time! Then they organize this experience into a presentation and lab report to share with the greater community (school, judges, etc).

These projects allow the students to be real scientists and problem solvers. They do research and multiple experiments to build upon the knowledge of the scientific community as well as their peers and themselves. Our students are naturally creative and also naturally intrigued by science. These contests allow them to link these interests in a real and exciting way. The projects involve a hands-on action science piece as well as a presentation piece. They also do research so that their ideas and developments are really new and build upon already known entities. In all these steps, technology is elemental. They use it to do research. They use it to record their results and express it as organized charts, graphs and diagrams. They also use it to type up the words that serve as their presentation, their lab report, in which they reveal what they discovered for others to learn from. This technology becomes essential to the project and the knowledge they gain about using it serves them far into the future. For the first time, they really understand that science is more than textbooks and experiments that have expected results. For the first time, they realize that not being successful and something NOT working is actually a good thing! It is a process of discovery, sharing and problem solving. It is active and challenging! They learn persistence and teamwork. Last year, both teams were in the top 20 in the nation in the NASA WLMR challenge which really reinforced their positive attitudes towards science, engineering and math as well as understanding that their problem solving was highly valued. Neither group came up with a totally finished product in the end, but they had certainly learned what things did NOT work and how to move passed that and move forward. Both these contests required electronic entries and this was a challenge not just in that they needed to learn how to use the technology but also that our school budget has only provided that we have only one desktop for student use. Teachers' have provided their own laptops in order to allow these students to do their very best and be a part of these experiences. The students have been very respectful and innovative in finding ways to work in which they can share use of the computer.