the Creative Learning EXCHANGE

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Borton Wins Award at Microsoft Worldwide Innovative Teacher Forum for its work in Systems Thinking: *Constructing Big Ideas with Small Children*

by Ginger Snider & Sheri Marlin, Borton Primary Magnet School, and the CLE staff

Borton Primary Magnet School, in Tucson, Arizona, was recognized for its work with Systems Thinking at the Microsoft U.S. Innovative Teachers Forum in Redmond, Washington in September 2006, and again at the Worldwide Teacher Forum in Philadelphia, PA, November 9-11, 2006. Borton was one of 57 international school and classroom-based projects representing 35 countries chosen to participate in the Worldwide Teacher Forum. Only four schools in the United States were selected to represent the United States in Philadelphia. The only U.S. school to receive an award, Borton was recognized for innovative teaching of content, based on work with systems thinking strategies applied to the instruction of primary-aged children. The Microsoft Corporation honored Sheri Marlin, an instructional coach, Ginger Snider, a librarian, and Renee Olson, a second grade teacher from Borton Primary Magnet School, for exemplary collaborative work within a learning team to impact student achievement

The teams that attend the conference are chosen because they "share individual expertise and create collective group knowledge" through technology to enhance their careers, as well as student achievement, according to Microsoft.

The U.S. Innovative Teachers Forum

An independent panel of nationally recognized education leaders selected the learning teams, based on team applications, to participate in the Forum. Up to three teachers were invited to attend the Forum. Each learning team was reviewed on criteria that demonstrate learning teams practicing the elements of 21st century learning in their own professional learning and then incorporating these skills into the student learning environment. The Forum also provided learning teams with the opportunity to share expertise and engage collaboratively with their peers from around the world.

The Borton educators were selected because of their "exemplary use of technology in the classroom, with their peers, and for their own professional development and productivity," according to a Microsoft press release.

Borton Primary Magnet School "is a school that lays the groundwork for primary children to realize their tremendous potential," said Brian Bratonia, director of Microsoft Corp.'s Partners in Learning Program, U.S. Public Sector.

"Here the staff is actively working to construct their own meaning for learning by participating in community-based field experience projects, continued and replicated in the classroom," said Bratonia in recognizing Borton at the awards dinner in September.

"Teachers prepare primary children to use system tools and research strategies. Children know what it means to access prior knowledge, locate sources, formulate questions, analyze and synthesize and share their results. Meaningful, embedded assessments are used throughout the school day to inform instruction and ensure that each student is making progress

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THIS ISSUE AT A GLANCE

EDITORIAL

As the school year wanes, there is still lots going on here at the CLE. We are finishing up a longitudinal video study, with footage from the early days of systems thinking in the classroom at Orange Grove Middle School in the Catalina Foothills District in Tucson, Arizona. We have paired that, thanks to Jim Morrison's archiving of the old footage, with a return of seven of the original students, who are now young adults. The video, both interesting and inspiring, is being produced with funding from the Kellogg Foundation. Be on the lookout for the finished product. We will announce it on our website, as well as in the listserve and newsletter.

Since the spring of 2000, the CLE, with the active participation of teachers and system dynamicists, has hosted DynamiQUE*ST,* an exposition of student work (grades 3-12), with coaching, games and interesting group problem-solving. This year we are again hosting it at WPI, with an exciting addition, seven students from China are joining their partners in modeling from Vermont Commons School in Burlington, Vermont. In our next issue we will report on both this exciting program and the projects presented at DynamiQUE*ST* this year.

We hope that the end of your school year is productive and peaceful. We are enjoying the burgeoning of spring and hoping that summer doesn't come too fast, as it is wont to do in New England!

Take care,
Lees Stuntz
(stuntzln@clexchange.org)

National Science Foundation Solicitation Released

"Graduate Teaching Fellows In K-12 Education (GK-12)" (NSF 07-555)

The National Science Foundation (NSF) announces the solicitation "Graduate Teaching Fellows In K-12 Education (GK-12)" (NSF 07-555).

Letter of Intent Due Date (required): Wednesday, 16 May 2007
Full Proposal Deadline: Monday, 2 July 2007

The program solicitation is available at:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf07555

Program Title:
Graduate Teaching Fellows In K-12 Education (GK-12)

Synopsis of Program:
This program provides funding to graduate students in NSF-supported science, technology, engineering, and mathematics (STEM) disciplines to acquire additional skills that will broadly prepare them for professional and scientific careers in the 21st century. Through interactions with teachers and students in K-12 schools and with other graduate fellows and faculty from STEM disciplines, graduate students can improve communication, teaching, collaboration, and team building skills while enriching STEM learning and instruction in K-12 schools. Through this experience, graduate students can gain a deeper understanding of their own STEM research. In addition, the GK-12 program provides institutions of higher education with an opportunity to make a permanent change in their graduate programs by incorporating GK-12-like activities in the training of their STEM graduate students. Expected outcomes include improved communication, teaching, collaboration, and team building skills for the fellows; professional development opportunities for K-12 teachers; enriched learning for K-12 students; and strengthened and sustained partnerships in STEM between institutions of higher education and local school districts.

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toward his or her learning goals. This occurs because of the faculty's commitment to collaboration, team planning, and exploration of innovative ways to increase student learning," said Bratonia.

Borton is "a school that prioritizes time for teacher learning and collaboration," said Bratonia, "because it knows that it is essential to support student learning. This is a school where every educator is a member of the learning team."[1]

Focusing on teaming and the elements of 21st century learning

The flattening forces driving change at an exponential rate have redefined the necessary skills required to be successful in the 21st century. In order for today's students to acquire these skills and be competitive in a still-evolving global economy, learning environments within schools must become seamless and emulate the characteristics and behaviors of the outside world. Furthermore, a learning environment which is conducive to enabling students to acquire 21st century skills must exist not only for the students, but also for the educators tasked with preparing the students, as they themselves must be well versed in and practicing these skills as professionals. Given the norm in U.S. education where teachers are working alone in isolated classrooms (behavior attributed to our factory-era schools), how are educators expected to acquire these skills, let alone infuse them into their teaching and learning with their students?

> "I believe we should give students a more effective way of interpreting the world around them. They should gain a greater and well-founded confidence for managing their lives and the situations they encounter."
>
> **Dr. Jay Forrester, 1994**

Microsoft, the National Staff Development Council, and the National Commission on Teaching and America's Future support the growing consensus that teaching, even good teaching, is better when teachers have the support of their colleagues and opportunities for continual reflection, inquiry, problem solving and learning together. Groups of teachers engaged in this kind of work on a regular basis are the learning communities that make good schools great and enable sustained professional growth for educators in the 21st century.[2]

Borton Primary Magnet School History And Description

Borton began as a magnet school in 1979 and has prided itself on quality education practices for young children. A daily community meeting each morning, full day kindergarten, small class size, weekly art and music, twice weekly PE, and quality before and after school care have been standard components of the magnet since its inception. Over the last three years, the school has worked to deepen its magnet program with a focus on its use of inquiry-based methods, project-centered content study and the incorporation of System's Thinking Tools. Borton Primary Magnet School offers a secure and culturally sensitive environment that nurtures the social, emotional, physical, aesthetic and intellectual needs of children through current, research-based methodologies focused on the unique needs of the young child.

Borton was invited to be a Water's Foundation System Thinking Project School beginning in school year 05-06. This invitation came in large part because of the school's commitment to collaboration, team planning and exploration of innovative ways to increase student learning. The staff agrees, "our active participation in the project has nurtured these fundamental principles. As a faculty, we are more mindful of using the Habits of a Systems Thinker in our daily operation. In addition, we utilize the tools in our daily instruction to support students in making their own thinking more complex." For additional information about Systems Thinking Project Schools visit their website at www.watersfoundation.org.

Two hours of weekly staff development time is provided by the school district via an early dismissal schedule one day a week. This job-embedded staff development is used for team planning, assessment of student work, discussion about the effectiveness of instruction and dialogue about critical issues related to students' overall achievement. Writing is collectively assessed a minimum of 4 times a year.

Further, the school's master schedule is currently being revised so that grade level teams will have an additional 3 hours per month of grade-level planning time. These sessions will focus on the goals described herein.

For the last four years, several weeks each summer have been devoted to on-site staff development. This training model has allowed us to enhance our skills as a staff, which increases our ability to plan and work together.

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In May 2003, the entire staff, including teaching assistants, participated in a workshop led by Sylvia Chard. An expert on project study for young children, Chard facilitated staff working in teams actively engaged in the practice of constructing their own meaning for learning by participating in a community-based field experience project. Teachers constructed projects to present the information learned and then shared the information with one another. This type of project-work continues to be replicated in classrooms. The experience of studying inquiry-based methodology together allows for greater collaboration and facilitates conversations among staff about how to best assess this type of project-work with students.

Required trainings such as Sheltered English Instruction (SEI) and Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are also provided in a joint format to better build a shared understanding of the state and national requirements. Further, the model allows teachers to dialogue about the implications of this learning for our particular student population.

In summers 2005 and 2006, teaching staff participated in training on the topic of Systems Thinking and Dynamic Modeling, based in part on the work of Peter Senge in *The Fifth Discipline (1990)* and *Schools that Learn (2000)*. The school is actively seeking to increase the use of systems thinking tools in our curriculum. Not only does this training increase our ability to help our students develop their thinking, but the discipline of team learning increases our awareness of the need to collaboratively work and plan together as a staff.

Additional training is planned for the coming school year to increase the staff's effectiveness at examining student work for the purpose of assessing the effectiveness of instruction. A demonstration videotape is being prepared that will feature colleagues in a simulated discussion reviewing student work, in which Systems Thinking tools are used as the method of assessment. Included in this application is the working prototype of a rubric for this purpose.

The physical structure of the school helps facilitate planning and collaboration. Six classrooms are paired with adjacent classrooms so teachers have regular opportunities to team. Two more sets of classrooms are being remodeled to encourage this type of collaboration. The remaining classrooms each open onto a central courtyard. Teachers regularly work with a partner teacher. Teachers determine the parameters of these pairings based on student need. Sometimes, like grade levels will partner to share students in flexible groups to provide additional instruction or intervention. Other times, teachers at different grade levels will partner as buddy classes to encourage cross grade level interaction and sharing. Paired teachers often plan instructional units together.

Borton teachers regularly form study groups for the purpose of engaging in an in-depth study of a topic or piece of professional literature. District-wide early release time facilitates these meetings, but staff initiated study groups are in no way limited to these sessions.

In school year 05-06, the entire school came together and created a 30-foot, masonry seating structure outdoors in our 2.5 acre bird sanctuary. Borton's Environmental Learning Laboratory Amphitheater, affectionately named Bella, will enhance the use of this outdoor learning area for study in the disciplines of science, writing, and art. This project became a huge undertaking and underscored, as no other project in recent school history, the ability of Borton teachers to work collaboratively in the best interest of students.

As a primary school attuned to the developmental needs of students, paper-pencil methods alone are insufficient to accurately assess a child's strengths and weaknesses with regard to his/her learning, and to monitor a student's academic progress. Therefore, collaborative assessment, the development of criteria, use of rubrics, and discussion of standards for student learning are essential to producing quality results with our students.

Learning philosophy and goals for the team

Borton Primary Magnet School is a K-2 school committed to helping young children learn to construct their own meaning by using an instructional philosophy focused on developmentally appropriate practice and inquiry-based methods of instruction. Borton is one of over 100 schools in a large urban school district.

Fueled by a desire to insure the success of all students and to find the best ways to support thinking, the team's goals for the coming school year are:

1. To develop additional ways to assess the complexity of children's thinking, monitor progress and modify instruction to accelerate their progress.

2. To increase the use of Systems Thinking Tools in all content areas.

3. To develop additional strategies that support young children in conducting inquiry-based research.

4. To increase the use of technology (Microsoft Publisher, Power Point and Video Taping) in the publication of research findings.

5. To use stock-flow diagrams in a study of the rain forest leading to students' ability to use STELLA software (produced by isee systems) to create a simple model.

Beginning in the 2005-2006 school year, Tucson Unified School District, committed to developing a job-embedded staff development program, placed an Instructional Coach in every school. This position is filled by a certified teacher who is committed to helping the staff develop teaching practices compatible with the school's philosophy, collaboratively assess student work and integrate technology to best meet the needs of individual students.

The creation of this position facilitated the learning philosophy of the team described in this application. The Instructional Coach, Sheri Marlin, along with School Librarian, Ginger Snider, work with teachers individually and as a team to develop lessons, assess student work and deliver instruction to students. The team's Classroom Teacher, Renee Olson, teaches second grade.

Incorporation of Technololgy

Central to the work of the school's learning team is incorporation of Systems Thinking.

Systems Thinking tools, particularly Behavior Over Time Graphs, Stock/Flow Diagrams and the Ladder of Inference, are used to support children's learning by making their thinking visible, allowing teachers to better assess students because they can see their thinking, understand their ideas and misconceptions and alter instruction based on immediate information. Additionally we have found that the use of Systems Thinking Tools consistently keeps instruction focused at the conceptual level, increasing the level of student thought and allowing teachers to clarify and extend student thinking. As students become more capable Systems Thinkers the use of computer modeling is a possible outcome of this method of instruction.

Student data is systematically gathered in an Excel document to allow for immediate access to information about student progress. Reviewing standardized data allows teachers to examine the impact of Systems Thinking Tools on student performance. The spreadsheets are also used to plan individualized instruction based on student need.

Benefits of Systems Thinking

- Makes student thinking visible
- Helps students make connections
- Allows students to explore multiple ways to solve problems
- Develops reading and writing skills
- Increases student engagement

Share the Information

Microsoft Publisher proved an invaluable tool in assisting students with the publication of their research writing, creating an opportunity to write for a real purpose, as described in the Information Card project below. Directly connected to the goals of this proposal is to extend use of Microsoft Publisher and to expand technological methods of sharing information using Power Point and video tape in Windows Media Player.

By its very nature, 21st century research requires the use of technology. Online information sources are available to students at each stage of the research process. Part of the team's goal is to find the best vehicles for helping young children access, comprehend and synthesize the information available to them online.

The final goal, building a computer model of systems in the jungle, involves inclusion of STELLA software (dynamic modeling software from isee systems). With the use of Systems Thinking Tools becoming more pervasive in our school, we are adding this technology to provide students an additional tool to make their thinking visible.

Sample projects

Project Example 1: Creation of Information Cards

The ability to access information is critical to the attainment of literacy in modern society. While technology has made information more readily accessible to all of us, care must be taken to assist young children in accessing this technology. Further, central to our school's constructivist approach is the need to incorporate required skills and competencies while allowing children to make choices about the content and process of their projects. During school year 05-06, following an in-depth exploration of the ocean through children's literature, hands-on investigations, and field trips, second graders were ready to begin research on the topic of the ocean.

The particular unit of study was collaboratively planned by the class-

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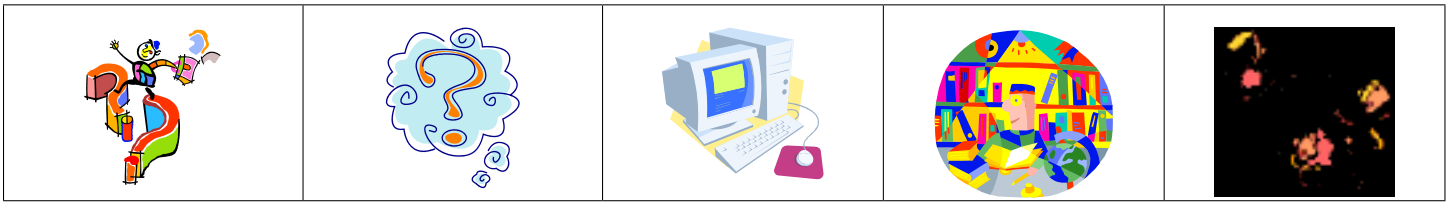
room teacher, school librarian and instructional coach. The classroom teacher, a participant in the Level I Systems Thinking training the previous summer, teamed with the instructional coach and the librarian to plan a unit of study that began with an introduction using Behavior Over Time Graphs to analyze children's literature related to the ocean. The graphs were used to chart characters' reactions over time, to analyze the concept of accumulation, and to focus students on their own reading comprehension. Then, using the same systems tool, students identified trends while reading non-fiction literature about the ocean. The teacher provided science instruction through the district science curriculum kit on liquids and the weather.

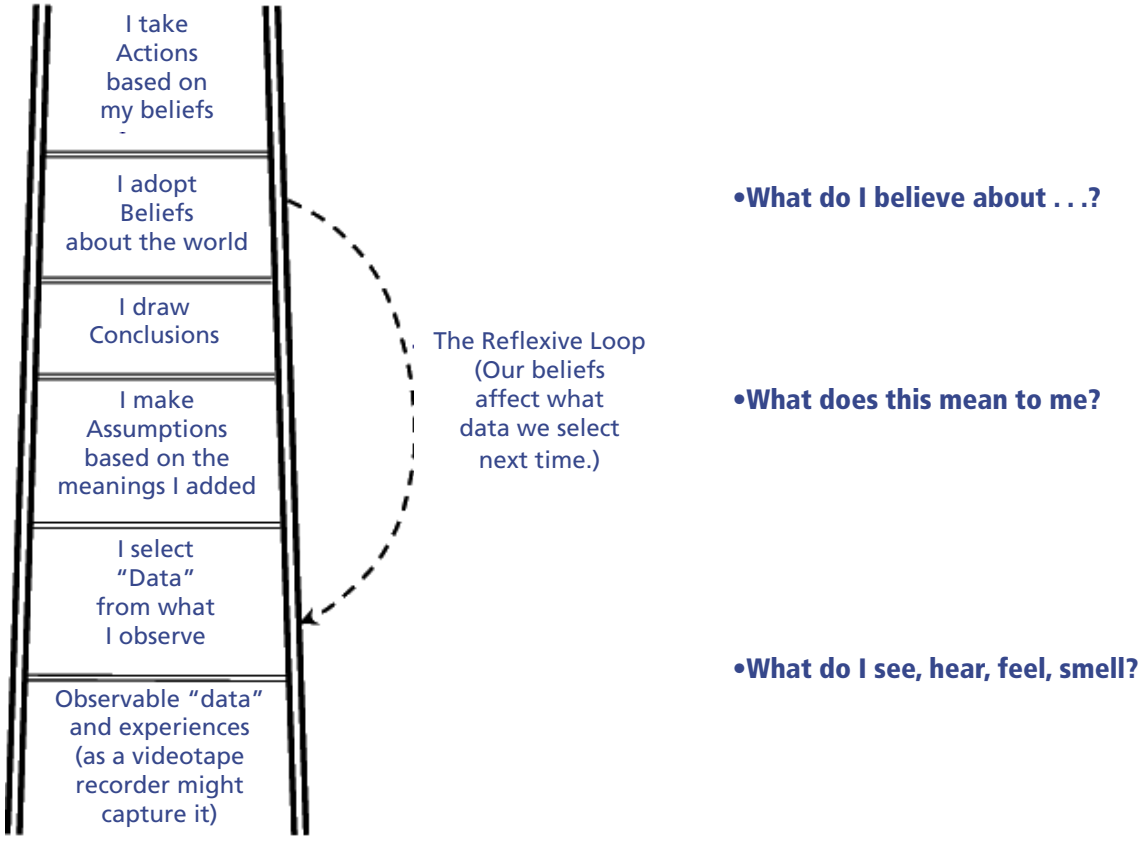
Research is taught as a five-step process, as illustrated in this diagram.



Access Prior Knowledge	Formulate Question(s)	Identify Resources	Access and Synthesize	Share the Information

The Ladder of Inference is a Systems Thinking Tool used to stimulate activation of students' prior knowledge. This diagram indicates our modification of Senge's work for the K-2 Classroom.

Ladder of Inference for K-2 students



From the 5th Discipline Fieldbook, Peter Senge, 1994.

After using the Ladder of Inference to explore students' observations and initial beliefs about the topic, students then locate and begin reading from a variety of sources, both print and online. At this point they have a foundation to formulate questions they want to research. In the analysis and synthesis phase, students are taught how to paraphrase what they read and how to incorporate new knowledge in the format of an information card. The information cards are designed and published using Microsoft Publisher, online clip art and Google Images.

Two samples follow.

How did a seashore form?

For an example, when the waves hit the seashore rocks will grind into pieces that will go into the ocean. The waves hit the sand . The sand will wear away. The water pushes air into little cracks in the seashore. The air pressure makes the cracks bigger.

One goal of the team for the coming year is to find additional ways for students to publish their research. The information card was a great medium that facilitated development of a final product while keeping the content short enough for young children to write and revise with a great deal of independence.

Is the octopus's ink poisonous?

No. It could make the enemies sense of smell bad and the octopus swims away to safety.

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Project Example 2: Short Stories in the Style of Chris Van Allsburg:

One tremendous benefit of the Systems Thinking Tools has been the collaboration that has occurred among staff. This particular project, again done in collaboration with the teacher, librarian and instructional coach, was prompted by a teacher of kindergarten and first grade students who had used Behavior Over Time Graphs to analyze word choice in both the classic children's rhyme, "The House That Jack Built" and their own innovated versions of the rhyme. She believed older students could use the tools to make substantive revisions to their stories and suggested testing this idea with second grade students. Second graders wrote a draft of a story based on illustrations in Van Allsburg's book, *The Mysteries of Harris Burdick*. The librarian then taught a lesson in which students graphed the level of suspense for each event in the Van Allsburg books *Jumanji* and *Zathura*. Students were then able to determine a pattern for the beginning, middle and end of Van Allsburg's stories based on their analysis of the Behavior Over Time Graph. Van Allsburg starts with relatively low suspense and, following the climax, returns to a sense of normalcy at the end of his books. Students then took the draft of the story they had written based on illustrations in the Harris Burdick book and graphed the level of suspense with each event in their own stories. Finally, students were asked to revise the content of their stories to reflect the same pattern found in Van Allsburg's stories.

The results were very promising. While young children are taught the writing process—Prewriting, Drafting, Editing, Revising and Publishing—substantive change is rare. The systematic use of the tools and adequate opportunities for discussion and collaboration between three teachers intent on helping students achieve the desired result produced significant improvement in student understanding. The desire of the applying team for the coming school year is to introduce this revision process earlier in the school year to allow for additional practice and assessment of student progress in the area of writing.

Sample: Jeffrey's story in the style of Chris Van Allsburg

It started in a state called Nurck. A kid and his father went to the dock and his father was wagging his light three times. Then there was a boat and it stayed in its place. They swam to the boat and they went on it. They saw pirates that are dead but the pirates are bones and they are evil. They were making a plan to blow up the planet. Then they are going out of the boat and called the Navy and they have a war. The Navy won and they had a party. It was a pizza party. The end.

Jeffrey's revision

A father and his kid were at the dock. His father was wagging a light three times and a boat stopped in its place. They swam to the boat to check it out and they went on the boat. They saw pirates that were dead. The pirates are bones and they are evil. The pirates were making a plan to blow up the world. The son called the Navy. The Navy blew the boat up. The pirates are still there. The boy turned the light off and wagged the light three times. The pirates were gone. The boy and his father went home and they never came back.

Student achievement connected to the team's projects (this does not necessarily mean test scores)

Meaningful, embedded assessments are used throughout the school day to inform instruction and ensure that each student at Borton is making progress towards his/her learning goals. Teachers use observation, anecdotal notes, standardized assessments, rubrics, portfolios and checklists to monitor children's progress. Children self assess, writing reflections and evaluations of their own class work. All of this data is melded together into four extended parent communications each year. At the end of each semester, parents receive a district report card that indicates a specific level of academic achievement in relation to the grade level standard for that child. In addition, at the end of the first and third quarter of each year, teachers compile a narrative detailing not only each child's academic level of performance, but also his/her performance with regard to growth as a learner, self-awareness, motor skills and aesthetic development. These narratives are presented during an extended conference where parents can ask questions and share with teachers their perceptions of their child's progress.

In addition to these embedded assessment measures, students in kindergarten are assessed using an annual pre- post- assessment for kindergarten in the areas of letter recognition, book-handling skills, written language and mathematical concepts. Children in grades one and two are assessed using district benchmark tests in mathematics, quarterly writing assessments and an end of the year Core Curriculum Standards Assessment (CCSA.). Second graders took the state achievement test, the Terra Nova, for the first time in SY 04-05.

Although test score data is limited for primary schools, and recognizing that scores represent a piece of a picture of a child's overall academic progress, as evidenced by the district curricular assessment results for SY 04-05, students at Borton outperformed the district average in all three academic areas: reading, writing and mathematics. Figures listed in the table below are the average number of students meeting mastery in grades K, 1 and 2.

CCSA Results for SY 04-05	**Reading**	**Writing**	**Mathematics**
Borton Average	69.4%	70.3%	65.9%
District Average	63.4%	60%	63.3%
Difference	6%	10.3%	2.6%

The CCSA scores for Borton identify an increase in student achievement from SY 03-04.

Increase from SY 03-04	Reading	Writing	Mathematics
Difference	4.3%	12%	9.9%

While multiple factors contribute to this type of progress, the team's goals of seeking to determine best practice through a collaborative process, collectively analyzing and assessing student work, and introducing innovative teaching strategies into the curriculum seem central to improved test scores.

The use of Systems Thinking and Dynamic Modeling at Borton has produced several promising results which have been noted anecdotally by different staff members as they have experimented with the tools. These include:

- Greater complexity of student thinking
- Students ask better questions
- Students ask more questions
- Teaching occurs at a deeper conceptual level than with traditional methods
- Students make more connections: personal connections to the text, connections between texts, connections between their research and their prior knowledge

While these anecdotally recorded gains are significant, it is the sincere desire of the team to find additional ways to document student learning and progress. Included in this application is an analytic rubric developed by the team last school year to improve the assessment of student work with systems tools. In the coming school year, our plan is not only to increase our collective use of the rubric to assess student work, but also to add an additional category to help us monitor student progress as they develop their *complexity of thought*.

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RUBRIC TO ASSESS WORK WITH SYSTEMS THINKING TOOLS

	1	2	3	4
Sequence of Events (x-axis)	Randomly placed events on the x-axis bear little resemblance to the story.	Correct events are placed on the x-axis. Some detail is provided such that the student can successfully retell the actions being charted.	Events are correctly sequenced. Adequate detail is provided in words or pictures so that reader can identify the event.	Most salient events are correctly sequenced. Events are sufficiently detailed so as to allow the reader to retell the story with accuracy.
Vocabulary of Change (y-axis)	Random words are placed on the y-axis.	At least 2 generic descriptors of the change are randomly placed on the y-axis.	At least 3, precise descriptors are given to explain the changes that are taking place. Words are arranged on the y-axis by degree of intensity.	At least 3, precise, original descriptors are given to explain the changes that are taking place. Words are arranged on the y-axis by degree of intensity, from least to greatest.
Plotting	Points are randomly placed or no line is present on the graph.	Most points are plotted accurately, based on content provided on the x and y axes.	All points are plotted accurately, based on content on the x and y-axes.	Points are plotted accurately and graph reflects more subtle changes taking place in the story/series of events.
Lesson Learned	Student is unable to write or state a lesson learned.	Lesson learned is vague and may not be tightly connected to the text/ events being analyzed.	Stated lesson learned demonstrates a good understanding of the text/ events and offers a reasonable theme or main idea.	Stated lesson learned demonstrates a deep understanding of the text/ events and offers an insightful theme or main idea.
Interpretation of Line	Graph offers minimal support for retelling of the story.	Student refers to graph to retell story/series of events.	Student uses BOTG to retell the story/series of events with certainty, focused on changes that occurred.	Student uses BOTG to retell the story/series of events with certainty, focused on changes that occurred, and offers an insightful response to those changes.
	Complexity of Thought To be developed school year 06-07			

Team Thoughts about this Process

The three-member team described in this proposal is committed to producing students who are successful academically and who are able to think and communicate with tremendous clarity. We believe in the capability of young children to think and to learn and we seek to create a climate where students are able to produce their best thinking. We strive to achieve these ends by carefully observing our students and adjusting our teaching practice to meet their needs. We work collaboratively with others in order to share best practices and to build a shared vision of what students are able to produce.

While we have integrated technology to help students produce a product and to track their progress, the

Special Educators Workshop in NH June 25-29, 2007

"Dynamic Modeling with STELLA" will build skills to integrate dynamic modeling into your classroom

Host: isee systems and Lexidyne, LLC

Location: Kimball Union Academy, Meriden, NH

Faculty: Steve Peterson and Corey Peck

K-12 Educator Fee: $900 (includes course materials, dormitory room and meals)

Credit: Eligible for 3 graduate credits from Plymouth State University

About isee's Workshop

If you are interested in building skills in Systems Thinking, System Dynamics, dynamic modeling and STELLA, this workshop is for you!

The five-day course is divided into two sessions:

"An Introduction to Dynamic Modeling with STELLA: A Systems Approach to Education & Research"

This three-day session details the language, framework, and process necessary to build effective dynamic models using STELLA software. Through an engaging mix of interactive presentations, hands-on exercises and projects of your own choosing, you will build skills that will serve as a solid foundation for applying STELLA in your teaching and research efforts.

"Dynamic Modeling with STELLA: Supporting Curriculum Development & Classroom Integration"

Designed for educators at the high school and middle school level, this two-day session is focused and very hands-on. Faculty will use a variety of applications from the natural sciences, social sciences and humanities to help promote curriculum development and creation of teaching tools using STELLA software.

"Dynamic Modeling with STELLA" is taught by Steve Peterson and Corey Peck, both highly regarded within the System Dynamics and dynamic modeling communities for their modeling skills and teaching abilities. Steve and Corey are principals at Lexidyne, LLC, a provider of dynamic modeling consulting and training services. Together, they bring over 30 years experience to the class.

To learn more or register online, visit http://www.iseesystems.com/summer or call (603)448-4990.

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team is committed to increasing our ability to do both of these things with technology as a tool to better facilitate this process. Further, we desire to add two additional programs, STELLA and Windows Media Player.

Participating with the Water's Foundation as a Project School and serving as a demonstration sight has been a great benefit to the students and staff at Borton. It has increased the dialogue about our practice and heightened our focus on helping students achieve their learning goals. By helping children make their thinking visible, use of systems tools has challenged beliefs that limit the abilities of young children. Our focus for the coming year is to continue to challenge these notions and to document evidence of student success.

The best evidence of the progress we have made through these efforts can be summed up in the words of one of our students who said, "This year I learned how to learn." That is our ultimate goal. Believing in the power of collective intelligence, participating in the Innovative Teachers Forum would allow this team to come together with other educators to learn more about learning so that we could better serve the students that we teach.

> "In K-12 education, system dynamics is not taught as a separate subject for its own sake. Rather, it is a tool to make current instruction more effective for students.
>
> Teachers view the systems approach as a way to do what they are already doing, only better."
>
> **Debra A. Lyneis**

REFERENCES

[1]Tucson Unified School District website: http://www.tusd.k12.az.us

[2]For more information on the Microsoft U.S. and World Innovative Teachers Forums, see the Microsoft website http://www.microsoft.com, the source for this article's information about the Forum.

Lessons from the Woolly Mammoths published in *Connect* Magazine

Lessons from the Woolly Mammoths, by Rob Quaden, Alan Ticotsky, and Debra Lyneis, was published in the November/December 2006 issue of *Connect* Magazine (volume 20, Issue 2).

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