What's The Big Idea?

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Sense-making Notebooks: A Learning Tool for Students and Teachers

(Editor's note: This article is third in a series on science and mathematics notebooks. In our second article, we discussed the role of the teacher in helping students construct sense-making notebooks by addressing various types of student entries that scaffold thinking. The important thing to recognize when selecting an entry type is that each notebook entry requires students to gather and interpret information in different ways.

In this article, we focus on using sense-making notebooks as a tool for teachers and students to promote learning.)

Sense-making Notebooks are all About Student Thinking

Perhaps the most important (and no doubt difficult) task a teacher is faced with is to discover what their students know and don't know. The "Engage" of the 5E learning cycle is one way to work toward accessing student's prior knowledge which reveals what students already know about a particular topic, including their misconceptions.

Teachers also build into their 5E lesson plan Decision Point Assessments which allow them to gauge students' understanding in real time.

Finally, the "Ask, Don't Tell" K-12 Alliance policy helps teachers remember to ask students questions – a student's line of thinking emerges as teachers ask follow-on questions. This begs the question: Why do we need to use sense-making notebooks?

Dave Hart, a participating fifth grade teacher in the Palm Springs Math Opens Doors Project, shares his thoughts on the matter:

Why do you use notebooks?

The big idea here is uncovering student thinking, which leads to effective instruction and a rich learning experience.

What did you hope to accomplish by using the notebooks?

Listening to students talk about math is one way to uncover student thinking. But, sometimes it is hard to capture and analyze. When a student writes, you still read about the process thinking. Consequently, writing in notebook reflects deeper, higher level thinking. That's my motivation for student notebook writing. However, students should reflect (individually or with partner) before they write because it gives them time to process their thinking.

What does the analysis of student work tell you about student understanding?

My learning goals are the fifth grade math standards. Quantitative assessments give you some good information. But, the picture is not complete without the qualitative. Student writing is the qualitative piece. The writing uncovers what the student knows, what the student does not know, and the misconceptions. After I read the writing, I do two things: first, I give the student feedback (by having a brief whole-class discussion) and second, I adjust my instruction.

Dave reminds teachers that writing is a complex form of communication that not only reveals students' thought processes, but also captures their understanding that can be evaluated, thus providing teachers opportunities to re-evaluate the direction of their instruction.

Using Sense-making Notebooks as a Learning Tool in Mathematics

Jasmina Ivanov is an eighth grade algebra teacher at Toro Canyon Middle School in Coachella Valley whose own schooling in Bulgaria influences her instructional decisions.

One reason she has always required her students to keep a notebook is because in Bulgaria every teacher and professor required it of her. As a student, Jasmina found that a notebook was sufficient to keep her notes, information and essentials; furthermore, she found her notebooks indispensable during finals weeks and before exams.

In addition to having students use notebooks in her classroom today, Jasmina organizes her students to work in groups of four and has high expectations of them. "I will definitely continue to demand a lot from them because my students are certainly capable enough to learn and achieve," she says. "I do not believe there are other options."

A recent visit to Jasmina's eighth grade algebra class reveals the way students actively use notebooks as a learning tool.

In the classroom, as part of a daily challenge question, students were asked to figure out a way to represent two coordinates on a graph. Students had to recognize the coordinates represented two different pieces of information and could not be placed on a single number line. In addition, the two number lines had to be perpendicular to each other.

Eventually, students realized the information given to them could be represented in the form of a graph. In order for them to successfully complete the challenge question, the students needed to synthesize their prior knowledge about number lines, data placement and coordinate planes.

During the challenge questions, groups of students discussed various possibilities of how to display the data. Within seconds of starting the activity, several student groups reached for their math notebooks. They scoured through the many pages that contained notes, sample problems and their own writing with a sense of urgency. The algebra students were convinced the pages of their notebooks contained valuable information that could help them with the challenge question.

When asked why they were looking in their notebooks, they replied: "I know I have done something like this before. I am trying to find it" and "There might be clues in my notebook that will help us figure this out."

Clearly, these eighth grade students rely on their notebooks as a source of information to help them remember what they already know, connect old information with new information, and, most importantly, provide a point of reference for thinking through math problems.

This observation exemplifies how students use notebooks as a learning tool, but what about the teacher? How does Jasmina use notebooks as a learning tool to guide her instruction? Here's what she shared:

What did you hope to accomplish by using the notebooks?

My students can write vocabulary words, and their definitions, math formulas and examples (with details and step-by-step solutions) that they can always depend on when going back through its pages during study time. It is easier to find the information for them this way. Besides, each rule is accompanied with an example. Therefore, it is a great source of information and visuals.

What does the analysis of student work tell you about student thinking?

Thinking in the "right direction" is difficult, especially if the students are not trained and not accustomed to the idea of using logic. Ironic enough, if students are left with no other choices, but to arrive at their own answers, regardless of the length of time (in the beginning), they just do the thinking, especially when you tell them that you will come back to them with the same question.

If given a certain amount of time to think, students certainly do the thinking. Furthermore, thinking in the right direction comes with prior knowledge in the subject area and experience in this approach of teaching/guiding students.

The use of sense-making notebooks allows all teachers, like Jasmina, to consider students' thinking as part of the total equation to promote student learning. A notebook on one hand can be a go to source of information, but it can also reveal where students stumble in their learning. In this case, Jasmina learned from her students that they have difficulty using logic, a big idea that no doubt will influence her instruction.

Using Sense-making Notebooks as a Learning Tool in Science

Jenny Lopez Ngigi teaches at Chavez School in Coachella Valley Unified School District. For the last two years, Jenny has directed an after school science program and has incorporated the use of student notebooks for primary level students who are also part of a Spanish-English Dual Language Immersion Program.

Jenny explains that her biggest surprise this year has been the writing samples produced by her second grade students, the same students who began the program last year.

Jenny tired something new this year – she taught students more about the mechanics of writing and used protocols to help them put words on paper. Jenny attributes the students' enthusiasm for writing to these changes in her instruction, and to the students' motivation to share what they understand about science. In many cases, students added sentences without being prompted – and in more than one language! (See sample 1.)

Jenny also realized that by having students expose more of their thinking through their writing, she was able to get a clearer idea about what they understood. Jenny's

NOTEBOOKS, CONTINUED ON PAGE 2

IN THIS ISSUE...

DIRECTOR'S COLUMN

The Matrix: What is Your Reality?

BY KATHY DIRANNA

The triangle: an important element in love, in mathematics and in teaching and learning. We know of its impact in relationships, we can identify it as isosceles, equilateral or scalene in math, but many of us have no clue as to the triangle symbolism in teaching and learning.

Simply put, the cornerstone (opps, vertices-stone) of education is the relationship among content, teacher and student. Our job in professional development is to make the triangle as strong as possible by linking good content with good teaching and good learning. A key to the strength of the triangle are the teachers: how deeply they know their content, how well they know their students and how they can provide meaningful learning experiences.

We all know some teachers are very effective with nearly all of their students, while others fail. Gary Waddell, a curriculum services administrator in San Mateo County noted, "The best teachers engage students academically while connecting with them emotionally in ways that create profound differences in both experiences and results."

From his administrative experiences, Gary created a teacher efficacy matrix as a way to identify and support master teachers. He presented his matrix in the Journal of Staff Development (Summer, 2009) in an article, *Who's That Teacher?* His matrix has implications for us who want to improve our craft.

In the matrix, one axis is "knowing your stuff" which includes teachers having a solid mastery of content and clear understanding of the standards. This axis also includes teachers who are adept with instructional strategies and facilitate their uses. These teachers know how to probe for student understanding, monitor and adjust instruction based on student responses.

At their best, these teachers are master teachers, skilled educators with whom nearly any student will achieve. At their worst, these teachers are technicians who make students learn something, but not necessarily like it!

The other axis of the matrix is "knowing your student" which measures how well the teacher "knows and values their students as individuals as well as in the context of their family, racial and cultural groups."

Skilled teachers on this axis understand what motivates students and how to connect with them. These teachers guide students not only academically, but socially and emotionally. Teachers high on this axis are caretakers who motivate and inspire; those low on this axis often alienate their students.

These axes result in four distinct quadrants:

Weak content and pedagogy	**Struggler** Weak in content, pedagogy and student focus, often resulting in student poor academic achievement and behavior problems.	**Caretaker** Kind and supportive but lacks a handle on content and strategies to raise student achievement.
Strong content and pedagogy	**Technician** Known for academic rigor, but who lacks the skill or will to meaningfully engage all learners.	**Master Teacher** Has the ability to connect with and motivate all students in the context of rigorous academic requirements.
	Weak Student Focus	**Strong Student Focus**

As I look at our teacher participants, I realized we are fortunate in the K-12 Alliance family to have teachers who are reflective in their practice and willing to spend their personal and professional time trying to improve their practice. Through our joint efforts, and our search for continuous improvement, our teachers are working to become master teachers.

As we begin yet another calendar year, let us celebrate our goal to move from the square (matrix) to the perfect triangle…in which content, teachers and students are entwined in meaningful and productive learning!

NOTEBOOKS..., CONTINUED FROM PAGE 1

interpretation of the student sample work above in Spanish is that this student understands the difference between the sounds...one is high and one is low; but he does not use the word pitch.

Jenny also thinks the second sentence seems to indicate that the student recognizes a relationship between the length of the tube and sound (pitch). Looking at the third sentence, however, she starts to question what the student really understands when he writes, "La mas alto hace pequeno (the highest makes small)."

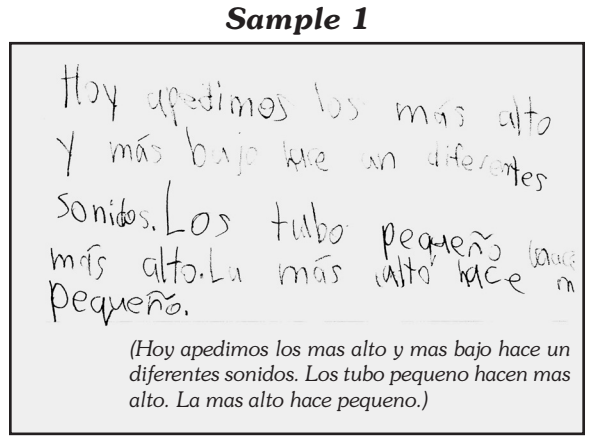
When Jenny looks at the English translation, she thinks the writing seems to parallel the Spanish response as long as she interprets the student's words "bigger" for higher and "smaller" for lower.

Analysis of this student work triggers three possible interventions for Jenny: how to get the student to use appropriate academic vocabulary both in Spanish and English, how to improve the student's syntax, and how to strengthen the student's understanding of the relationship of length to pitch.

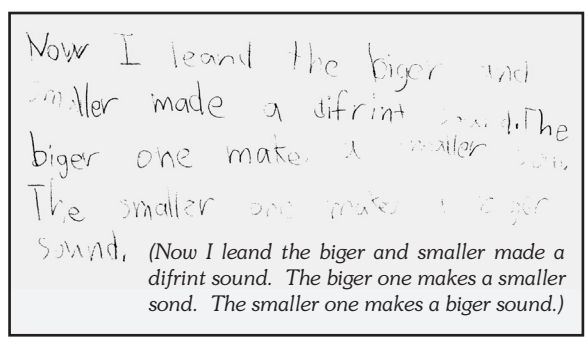
"When we did writing unconnected to science experiences, many of my students would only write a sentence or two," says Jenny. "Now, doing the science experiments first and giving students a process for writing, I see my students excited and wanting to explain what they know. Being able to read my student's thoughts help me be more reflective of what I need to do next in my teaching."

Jenny's responses to our questions follow. As you read Jenny's thoughts, consider joining Jenny, Jasmina, Dave and many others in using sense-making notebooks as a learning tool for both students and teachers.

Sample 1



(Hoy apedimos los mas alto y mas bajo hace un diferentes sonidos. Los tubo pequeno hacen mas alto. La mas alto hace pequeno.)



(Now I leand the biger and smaller made a difrint sound. The biger one makes a smaller sond. The smaller one makes a biger sound.)

Why do you use notebooks?

I was encouraged to do notebooks for two reasons: one, because of the research behind it and two, because I see that it is through note taking and reflecting upon what is being done or learned that the student rises his or her level from knowledge to comprehension.

What did you hope to accomplish with the notebooks?

My goal is that through the technique of inquiry, leading them to see the conceptual flow of the subject presented to them, and note taking (a record of their thoughts and understanding), my students will reach a level of evaluating their own learning.

What does the analysis of student work tell you about student understanding?

It allows me to see where students are in the ladder of learning a concept.

What do you change in instruction based on the level of student work in the notebooks?

Based on the information I get from the students' notebook, I know whether the child is ready for the next concept, or if I need to provide that child the opportunity to do a hands-on activity or if that child only needs some questioning that will allow him or her to meet the lesson's objective.

In our next article, we will present a rubric designed to foster student's thinking by using the various types of notebook entry types.

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LEADERSHIP

Diving In and Making Waves

BY JUDI WILSON

Judi Wilson

"You recruited teachers for California Science Implementation Network (CSIN) and now you need to be the Staff Developer," said the voice on the phone. That was 20 years ago. Little did I know that I would soon be taking an unexpected path in my career and being exposed to ground-up walnut shells for stream tables, making ice cream in a Ziploc® bag and the infamous sock sex.

Key to our efforts in CSIN was leadership training. My assigned task for one of the first Summer Institutes was to "do something on leadership," so I bought the then-current book *Swimming with the Sharks* by Harvey MacKay to give me some ideas about how we could all suddenly be leaders.

And swim we (somewhat) did! We certainly gathered enthusiasm, had a lot of fun, tolerated the college dorms and gained weight by raiding the snack closet in the evening – but we also left with a mixed bag of leadership skills to use for the daunting task of implementing the CSIN program at our assigned schools.

In retrospect, I think we were better prepared than we thought, because we really *believed* we were leaders and followed the mantra "Leadership is responsible action for that which you feel is important." In looking back, "*Swimming With the Sharks*" was prophetic and a good analogy for important components of leadership that I have found useful over the years:

1. **Dive IN.** Leadership is action, not position. I have worked with hundreds of teacher leaders and have learned that each teacher leader has unique skills for developing, designing or running a program, project or event, and they each play an important part. When they become empowered, teacher leaders are willing to take on more responsibility. Current research on teacher leaders shows that these leaders can be a very important part of school improvement and they are especially critical in science education because of the few curriculum personnel in science.
2. **Come UP for Air.** Believe in making a difference. Get support. When teachers associate with other leaders and become educated and empowered, they grow in confidence and expertise. Once teachers develop an "I Can Do It" efficacy and build relationships with other involved teachers, leadership activities are a natural byproduct.
3. **Make Waves.** Even a small amount of movement makes waves. Each year, we sponsor an event called "Catch the Working, Action, Vision and Education (WAVES) in Science" to celebrate leadership in science. Be an "asset builder." AFFIRM what you want to have happen. Banish all comments such as: "Science isn't happening in our school," or "No one wants to do science," and make an attempt to never dwell on what might drag you down. BE what you want to have happen – heart, body and mind.
4. **Go the Distance.** Leadership involves collaboration and often takes time and many steps to accomplish something important. Forget the credit and focus on the addressing the task or challenge. Make sure your goal has a clear vision of what needs to be accomplished and what the ultimate purpose is all about. Be tenacious and don't give up!

MAKING WAVES, CONTINUED ON PAGE 4

TEACHING & LEARNING

Classroom Rewards

BY JAMES FENNEY

(This is my second year being involved with the K-12 Alliance, and I have directly seen my classroom grow dramatically in science and Language Arts because of the K-12 Alliance! Let me tell you what recently happened to me and my students.)

One day, our principal Dr. Susan Yakich said Superintendent Dr. Carol Leighty and new board member, Dr. Rutz-Robbins, where coming to visit. I always love sharing how hard our kids are working, but I also get worried that my lesson or activity might not be as impressive as I want it to be.

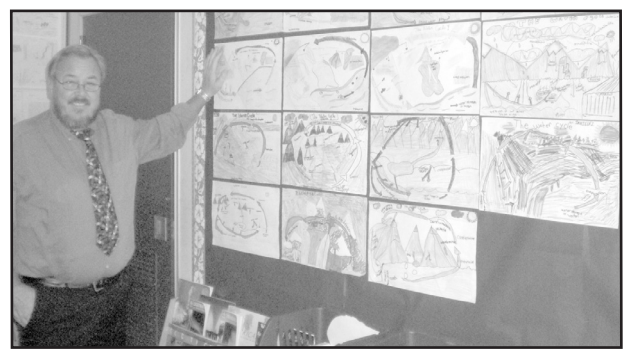
Having recently finished training and lesson teaching days with the K-12 Alliance a few weeks earlier, I decided to bring a lesson I learned with the Alliance into my own classroom.

With the K-12 Alliance, I learned that only three percent of all of the water found on Earth is fresh water. Because of such a limited amount of fresh water, conservation needs to be a number one concern for everyone.

Throughout the lesson, my students discovered firsthand how much water is wasted everyday, but they also learned ways they could save water. We started working on the Water Cycle and the students spent a few days creating the flow chart so they could use it as an aid for their writing activities.

Because I learned the 5 Es along with the Conceptual Flow with the K-12 Alliance, I got the opportunity to dive deep into content material and student engagement. It's like finding a path to the pot of gold – which is student learning. With these tools, I am learning student enjoyment and teacher satisfaction, as well.

On the day our special guests came to visit, my students were looking at their Water Cycle charts and notes. I had put a Step-Up-To-Writing outline on the board for students to list three key ideas for their writing activity. I had made a persuasive writing prompt for water conservation. Students were asked to take a stand pro or con and support their stance. While all of this was going on, our principal and visitors arrived.



STUDENT WORK – Teacher James Fenney is proud of the work his students have done recently on the water cycle.

Dr. Leighty and Dr. Rutz-Robbins were amazed by the students' Water Cycle flow charts. They were also excited to see science being used to promote Language Arts. At the students' desks, they talked with the kids and looked over their work. Naturally, I was nervous, but I was excited and proud of my students.

Later that day, I received one of the most rewarding e-mails I have ever received during my entire time teaching. I have always imagined my leaders coming into my classroom and being speechless – *but that's what exactly happened that day!* The e-mail said our visitors were extremely impressed to see how we were integrating Language Arts in our science programs. I knew our class had been singled out.

This could have only happened because of my involvement with the K-12 Alliance and its outstanding educators who truly live and model the practices they teach us.

This year my learning is still going through the roof, and it's hard to contain my enthusiasm! Thank you K-12 Alliance for giving teachers the tools we need to make our classrooms a model on "How It Should Be Done!"

James Fenney is a fifth grade teacher at Temecula Elementary.

COLLABORATION

Seeking Science in the Community

BY JAMES KISIEL

Science learning happens all the time—in museums and aquariums, in parks, on the Internet and in our homes. Given the amount of time we spend *out of school*, these places provide resources that are important pieces of everyone's science learning landscapes.

Science centers, natural history museums and zoos are community institutions that foster *informal science learning*. Unlike the traditional classroom, these places allow learners to choose when and what to learn, as well as with whom they will learn.

Although these locations are often seen as family destinations, most make significant efforts to support science learning in formal or classroom settings through outreach programs, professional development workshops, and of course, the traditional field trip.

Unfortunately, studies indicate that many informal science institutions struggle to connect with teachers, and that teachers are typically unaware of the resources these community institutions offer to schools and teachers. How can this connection improve?

As part of a three-year CPEC project, the K-12 Alliance and California State University Long Beach faculty are involving informal science institutions in professional development efforts at Bell Gardens Elementary School in Southern California.

In addition to reinforcing teachers' science content knowledge and instructional approaches through Teaching Learning Collaborative (TLC), project leaders are engaging teachers in a variety of activities to help expose them to resources that these informal science institutions offer.

Last year, teachers met at the Discovery Science Center (DSC) in Santa Ana and were given guided investigations and observations to carry out within the Center. Different groups were given different activities, depending on their grade-level science content training (e.g. rocks and minerals, atmosphere and weather, space, etc.).

These were not the typical 'scavenger hunts' often seen in museum sites, but rather open-ended prompts that required participants to observe and manipulate exhibits, and ask questions related to their experiences. These experiences served as jumping-off points for more in-depth content discussions back at their school.

For the second week of the training, DSC took the role of PD provider, engaging teachers in sessions adapted from their free monthly teacher workshops. These two-hour workshops feature several related science concepts (e.g. the rock cycle or force and motion) and their connections across elementary grade-level standards, with particular emphasis on common misconceptions.

These teachers participated in DSC-led hands-on Earth science sessions (last year's content focus). Following these workshops, a brief seminar introduced teachers to the idea of community institutions as sources of science teaching support.

As the multi-year project continues, additional local informal science institutions will be tapped to further support these teachers' professional development.

Project leaders are hopeful that experiences with institutions like DSC, a rich learning environment for both teachers and students, may begin to help educators understand how these locations provide learning opportunities beyond the traditional fieldtrip.

James Kisiel is an Associate Professor in the Science Education Department at California State University, Long Beach.

Our First TLCs!

BY BRAD SCHLEDER

Cooler temperatures were not the only benefit that October brought to the Central Valley. It was also the month of the first Teaching and Learning Collaborative (TLC) for Kings Canyon and Sanger school districts.

Participants came from the full spectrum of education: pre-service teachers, teachers, professional developers and university faculty members. Staff developers polished up their facilitating skills by revisiting their K-12 Alliance TLC Field Guides. Food was ordered, chart stands assembled and thousands of post-it notes were purchased for the six-day event.

The 46 lead teachers had spent a week of training at the K-12 Alliance's Summer Institute and were glad to be working together again. Lead teachers and their teams spent one day planning and another day teaching their lesson.

The planning day began with our fearless leader, Rita Starnes, who started with one of her famous openers that took care of our personal and interpersonal needs before we settled into our task.

After Rita's presentation, staff developers – Jennifer Weibert, Brad Schleder, Josie Fierro, Heidi Betancourt, Teresa Mitchell, Tammy Abbott, Emily Rowell and Terry Sayre – began facilitating the beginning of the TLC process.

NEW METHODS – Josie Fierro, staff developer from Sanger, (far right) facilitates her first K-12 Alliance TLC with teachers (from right) Marcia Graham (Sanger) and Juan Sanchez (Kings Canyon).

Soon, chart papers emerged and three sizes of sticky notes were posted and reposted on the teachers' conceptual flow charts. Flows developed throughout the morning and were accompanied by thoughtful conversations regarding how to achieve the flows' Big Idea.

Density, static electricity, properties of metals, and ecosystems are just a few examples of the content of the various TLC lessons. Staff members from Fresno State University faculty served as content experts; Sue Bratcher, Madhusudan Katti and Steve Blumenshine, assisted the groups by answering questions and clarifying certain scientific concepts.

"Their expertise helped us clear up some questions we had and gave us confidence to move forward," summed up one teacher.

By the afternoon, groups started constructing their 5 E charts based on their conceptual flows. Teachers enjoyed working collaboratively, building lessons that would bring exploration and inquiry into their classrooms.

"I really enjoyed taking a concept and building an amazing lesson to match it," explained one teacher. "Allowing myself to design the content of instruction gave me ownership of the lesson."

The sessions were eye-opening for pre-service teachers. "I can't believe how much work goes into planning a lesson. I thought you just copied worksheets and gave them to the students," remarked one college student.

At the end of the planning day, lessons were divided into sections that specific teachers would deliver. Lists of materials were generated and tasks assigned so everything would be in place for the lesson.

The teachers also expressed their thanks to their staff developers. "I really appreciate all of their hard work, and their ability to guide us through the process," said one teacher. "The end result is a lesson we can all be proud of."

With the teaching day approaching, the staff developers sent out reminders and gathered their multicolored sharpies, their team's lesson plan and plenty of notebook paper to script the lessons. "I was really nervous, but excited at the same time," recalled one staff developer. "I knew my team would do a great job and that we would all learn from this experience."

In the classrooms, the lessons finally came to life.

TLC PARTNER – As IHE partner, Madhu Katti (center), faculty from CSU Fresno, helped with content.

What students interpreted as a fun lesson was actually a carefully crafted lesson plan that activated student prior knowledge and required student exploration using guided inquiry. Using questions and activities as formative assessments, teachers were able to monitor and adjust their instruction to meet student needs.

Several content experts joined a few of the teams on teaching day so they could act as a resource and see some excellent teaching up close. "It was awesome to be a part of the planning of the lesson and to see how skillfully the teams delivered dynamic lessons that thoroughly engaged their students," said one impressed professor. "At the end the students really grasped the concepts being taught. I am going to use some of these ideas in my university classes."

The staff developers were also very pleased with the teaching days, and one developer succinctly summed up the nature of the TLCs: "Going through the whole process was inspirational for me. I saw students who were excited about learning and teachers who were reignited about teaching. That's what this is all about – inspiring a passion for learning in each other and in our students."

Brad Schleder is a K-12 Alliance Staff Developer and Academic Coach for Kings Canyon Unified School District.

Environmental Education: EEI Updates

BY ANDREA LEWIS

For the past six years, the California Environmental Protection Agency (Cal/EPA) and the California Integrated Waste Management Board (CIWMB) have been leading the charge to bring education about the environment into California's public schools. Entitled the Education and the Environment Initiative (EEI), this unprecedented work brings environment-based education into California's classrooms resulting from AB 1548 (Pavley, Chapter 665, Statutes of 2003) and AB 1721 (Pavley, Chapter 581, Statutes of 2005) and funding in both 2005 and 2008 by Governor Arnold Schwarzenegger.

There are a host of provisions in the laws, but of particular interest to the education community is the creation of a K-12 curriculum that teaches students about their relationship with the environment while teaching to California's academic content standards in both Science and History-Social Science. The development of this curriculum has been a multi-year endeavor involving creation of California's Environmental Principles and Concepts, a thorough review of subject-matter standards, and an in-depth standards alignment process.

From this work, a plan was crafted, refined and re-refined, leading us to a curriculum comprised of 85 units, 45 units in History-Social Science and 40 units in Science, stretching K-12.

The EEI curriculum differs from existing environmental education materials because it was designed, by law, for teachers to use in conjunction with existing textbooks.

After years of development and extensive field-testing in 19 California school districts, the curriculum is nearly complete. The EEI's 85 units recently underwent a state-sponsored review in which teachers and content experts evaluated the instructional materials for five separate categories as fully met, partially met or not met.

Category one, dealing with scientific content and its alignment with standards, must be rated as fully met in order for the instructional material to be adopted. Categories two through five can be rated as partially met and the material can still qualify for adoption. These categories include: program organization, inclusion of assessment strategies, universal access and instructional planning and support

Seventy-six of the EEI units passed this review and are scheduled to be presented before the State Board of Education for approval in January 2010; the remaining 9 units in early 2010.

Tricia Radojcic, a K-12 Alliance middle school science teacher from Temecula Unified School District, served on the panel that reviewed the materials. "The amount of effort and dedication to this process was remarkable," she says. "The dedication of the panelists in completing the exhaustive and detailed work is to be commended, as is the commitment of the CIWMB and Cal EPA. Significant resources were devoted to producing materials that are engaging to students and their choice to submit the product to the rigors of state review is impressive. In days when our education system is often under fire, it is a pleasure to see so many committed to providing our students with good instructional materials."

Curriculum approval is the first step in EEI implementation in California's schools, and facilitators are now exploring how best to offer professional development opportunities and identify where to begin school district implementation.

Even with the EEI curriculum available on the Internet free-of-charge (also by law), EEI facilitators hope to provide high-quality printed materials upon request. The goal is to have the EEI curriculum available to approximately 50 California school districts starting in Fall of 2010.

For more information about the EEI, visit www.calepa.ca.gov/education/EEI and join the listserve to be notified of latest developments.

Andrea Lewis is the Assistant Secretary for Education and Quality Programs, Cal EPA.

MAKING WAVES, CONTINUED FROM PAGE 3

5. **Make a Splash!** In the process, don't forget to have fun and add frivolity to any event. We can't ignore the importance of door prizes, freebies, and of course, "logo wear" that helps develop community and identity. Can we ever forget the enormously popular CSIN logo boxer shorts and the logo emblazoned beach chairs that hinted we actually had enough downtime to use?

I actually took quite a bit of teasing from my colleagues after that first institute for my "Shark'isms." We definitely have huge challenges for science education in our state, but I am confident that the wonderful teachers whom I have had the opportunity to learn from, work with, and call friends will continue to "Swim with the Sharks" and tackle important issues as good leaders.

Judi Wilson is a former Regional Director for the K-12 Alliance, current Co-Director of the Delta Sierra Science Project and developer of programs, projects and resources for science education partnership to enhance science education PreK-12.

When Judi was dragged reluctantly into science education, she turned her energies and expertise into forwarding teacher leadership and improving science education throughout her county, region and the state. She is especially interested in partnerships that enhance science instruction and knowledge and has developed several volunteer scientist programs that are highlighted at www.vistaslearning.org.

Judi recently retired from her position as Director of Science and Special Projects at the San Joaquin County Office of Education.