

What's The Big Idea?

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ACT Up With Assessment Centered Teaching

(Editors note: In this era of high stakes, large-scale testing -- that is often disconnected to learning -- we at the K-12 Alliance are committed to providing alternative ways to think about assessment and learning.

This year, we present a series of lead articles about Assessment Centered Teaching (ACT), a product from the Center for the Assessment and Evaluation of Student Learning (CAESL) funded by the National Science Foundation. CAESL is a collaborative partnership of WestEd; the University of California, Berkeley's Lawrence Hall of Science and Graduate School of Education; University of California, Los Angeles's National Center for Research on Evaluation and Student Standards (CRESST); and Stanford University.

In this first article, we provide the context and results of Assessment Centered Teaching that are captured in a soon-to-be-released book, Assessment Centered Teaching: A Reflective Practice published by Corwin Press. The book is the result of a professional development collaboration of the K-12 Alliance, Lawrence Hall of Science and CAESL researchers.

Stay tuned. In future articles, we will provide the process and tools for Assessment Centered Teaching.)

Let's clear this up in the beginning. The book *Assessment Centered Teaching: A Reflective Practice* is not about testing.

At least not the type of testing that we conduct at the end of the year to determine whether or not students are below basic, or whether or not schools should be categorized as low performing. Much is being written (mostly in the media) about that type of high-stakes testing.

No, this book is about a different type of assessment for which we believe the stakes are even higher. It is about "quality classroom assessment," which is at the heart of quality teaching, not merely at the end of it. These stakes are the essence of a quality education: equitable opportunities for all students to improve their understanding and become exceptional citizens of the world.

The book reflects our journey toward classroom assessment in the service of student learning which began in the fall of 2001, when the National Science Foundation (NSF) funded the Center for the Assessment and Evaluation of Student Learning (CAESL) to improve student science learning at all educational levels.

In short, our responsibility was to build science teachers' capacities to engage in formative assessment. The NSF encouraged us to design new professional development strategies in collaboration with other CAESL experts. Our project brought together the diverse expertise of researchers, assessment specialists, psychometricians, curriculum developers, professional development leaders, and science teachers and administrators. The concept of Assessment Centered Teaching (ACT) and the ACT Portfolio were products of these efforts.

ACT emerged from assessments that are integrated with science teaching in ongoing cycles of planning, instruction, assessment and revision of instruction. Teachers must not only assess what students understand, they also must use that information systematically in their teaching to guide students toward sound

understanding of science concepts and processes. Ongoing and systematic use of formative assessment is critical in order to reduce existing learning gaps among students.

The ACT Portfolio is a set of tasks that guide teachers through a reflective process of planning, using and revising classroom assessment for an instructional unit. Using the portfolio's prompts, teachers systematically examine student learning over time and monitor the development of student's conceptual understanding, guided by an instructional roadmap based on student learning goals. In this cycle of assessment and instruction, evidence from assessment is used to inform learning goals, guide instruction and revise assessments.

In short, all assessment becomes formative.

Yvette's Story: Transforming Assessments

Teachers, like Yvette Jones, a middle school science teacher, participated in our professional development program, the Science Assessment Leadership Academy.

Yvette's story is how one teacher transformed her thinking about assessment, from summative tests for assigning grades to formative assessments. Naturally, this change brought about improvements in her instruction.

"[Working on the portfolio] has given me an opportunity to look at how I teach and how I examine the student work — not just to assess students, but to assess the lesson and what's effective and what's not effective. ...Whereas before it was, 'OK, I have a test. I need to give it.' ...Now I realize, it doesn't have to end with a final grade — [the assessment] can be something that helps me to structure my lessons...to gauge students' progress over time throughout the unit...[and to] strategically plan to optimize learning for all of my students."

With 15 years of experience and participation in the K-12 Alliance professional development programs -- including the Teaching Learning Collaboratives (TLCs) -- Yvette was intrigued by the role and value of formative assessment for supporting student learning. Still, she had no experience developing more formal and systematic assessments. She knew, however, she and her students would benefit from such a process.



SUPPORTING STUDENT LEARNING — ACT improves science understanding on all levels.

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Plan for Assessment Instruction.

ACT requires unit assessment planning to establish clear learning goals and identify assessments for analyzing students' progress toward those goals.

Yvette began her plan by creating a conceptual flow (see WTBI? September, 2004) for her Plate Tectonics unit. The conceptual flow helped Yvette identify key concepts that students should know in order to understand the major ideas of her unit such as convection, density, volcanoes, faults and sea floor spreading. With these learning goals identified, Yvette was ready to think about assessment.

It sounded simple, but Yvette had never designed an assessment plan for an instructional unit; it was a new idea to follow changes in student understanding from a pre-assessment through several juncture (interim) assessments to a post-assessment.

It's hardly a surprise that Yvette's initial assessment plan was essentially a compilation of any assessments she and her colleagues could find in the unit. They weren't sure exactly what they were looking for and listed pages of unit activities that they felt had assessment potential. Many of these, however, were not well aligned with the core learning goals or with one another.

By the time Yvette finished her third portfolio, she had developed a far more strategic and integrated approach to assessment planning.

"Now I can see where a pre-test for the entire unit is also valuable, and that you can use it to gauge students' progress over time throughout the unit. You can actually document a well-laid out map of the conceptual flow and base that on which concepts the students understood or didn't understand. [Using juncture assessments] gives you the opportunity to look back on student progress then in a more strategic way and figure out where the pitfalls were for each concept for each lesson. And [the juncture] is considered a crucial place... [because] if students don't have understanding of certain concepts, they're not going to be able to fully connect concepts later on in the unit..."

Yvette and her colleagues referenced this integrated assessment plan document throughout the teaching year. Their analysis enabled them to pay attention to student progress throughout the unit in learning complex concepts like convection and density.

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Mutiny On Many Bounties

BY KATHY DIRANNA

Like many of you, I began the summer watching Johnny Depp swagger across the screen. Like many of you, I drooled, laughed and was amazed by the technology that brings such lore to life. I also was intrigued by Cap'n Jack's messages: life-long learning, passion, creating the best that you can where you are, reaching out to others who are open to new ideas, and embracing collaboration.

Then I realized, these messages have been cornerstone elements of the K-12 Alliance and have served us well. Who knew Hollywood could be so perceptive?

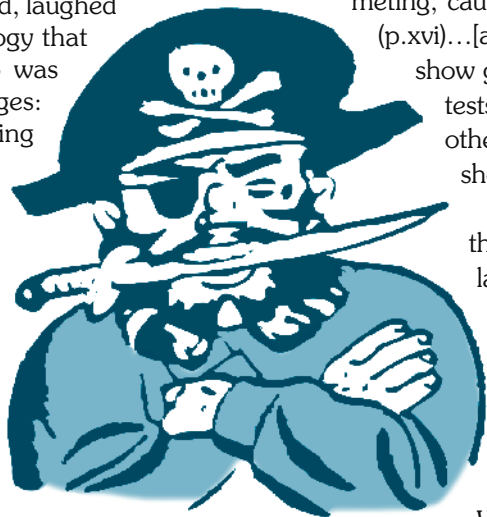
As we begin our 21st year of service, I think about connecting with this pirate friend in yet another way: Mutiny! A rebellion against legal authority by those refusing to obey orders.

From where I sit (in hundreds of classrooms) I see child abuse. No, no. Not the physical form, but most certainly the emotional form. And no, not from the hands of our teachers who are trying to improve their practice and improve the learning of each child.

Unfortunately, the problem is much deeper. This abuse is inherent in educational policies brought about by political agendas. A good example is No Child Left Behind which has components that make good sense (e.g., every student should have a qualified teacher, etc.) but other components, such as high stakes tests, are disastrous. We need a change and we need it now.

Sharon Nichols and David Berliner suggest in their book, *Collateral Damage*, that high stakes testing corrupts America's schools. They write:

"Our nation needs to worry about the environment created by high-stakes testing...we found...administrators who "pushed" children out of school or did little to keep them in school if their test scores were low, costing too many students the opportunity to receive a high school diploma. We also found school boards that had drastically narrowed the curriculum and who forced test preparation programs



on teacher and students, taking scarce time away from genuine instruction. We found teacher morale plummeting, causing many to leave the profession. (p.xvi)...[and] although a state's own test may show gains in student achievement, audit tests (assessments based on something other than the state's own tests) do not show such growth (p.200)."

I agree with many of the authors' sentiments to not defend a law that uses a single test to make important decisions about the lives of students, teachers and the fate of their schools, or a law that equates testing with teaching. There are other rumbles afoot, matey. Read Education Week or Education Leadership and you will find more and more articles about the drawbacks of our current system. This is hopeful.

But I also know that no amount of ranting will change things. We must take action where we can and work within the system to make a difference. The point is, we can. Imagine where we could be if we all acted on, "I'm mad as hell, and I'm not going to take it anymore!"

I advocate quality teaching and learning everyday of my professional career as I meet with teachers, work on state committees, interact with district personnel. But I can do more, and I pledge to do so. Will you join me in this mutiny?

As you begin the school year, think about your own advocacy. Share with parents what the testing is doing to your classroom and to their student's learning. Serve on school or district assessment committees to ensure that common assessments and benchmarks don't just "mirror" the state test, but provide meaningful information so you can monitor and adjust your teaching to meet student needs.

Stand up against inane procedures that make learning a joke (e.g., drill and kill, short-cuts with no understanding, taking students out of science for remedial math or reading classes). Find other colleagues who are like-minded and speak out together.

The best way to know your future is to create your destiny. Yo ho!



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"...The pre-assessment, the post-assessment and the juncture assessments actually pulled the entire unit together and allowed...me to chart student progress over time, and then, as a unit, be able to figure out where the pitfalls are in that unit."

Analyze Student Work.

Through careful analysis of sets of student work, Yvette developed new methods of interpretation and new understanding of assessment concepts.

"Having to look at the student work in detail is what's very different [about the ACT Portfolio process] and then documenting that and being able to use that documentation to look at student progress over time — it is definitely the biggest change in my practice."

Yvette learned a key lesson about assessment — that information she could gain from student work was of the quality as her assessment tasks and assessment criteria. She very quickly shifted from acting as a consumer of her instructional materials to becoming a professional who took ownership of her materials and made revisions to the assessments.

Recognizing that assessments had to be aligned

with instruction, Yvette revised many assessment tasks so that they targeted the concepts she had identified as her learning goals. She also revised the instructions for some tasks when she became aware that her students did not clearly understand the tasks, for example, she scaffolded several complex questions so that students had better access to the questions.

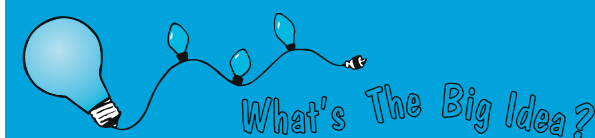
If Yvette discovered weaknesses in her assessments after administration, she quickly devised a follow-up assessment and made revisions to the original tasks for future use.

Use Evidence to Guide Instruction.

Yvette used information from her unit assessments to provide students with valuable feedback about their learning.

Yvette shared pre-assessment results, because she recognized that they "give the students an understanding of where they're at" before she launched the unit. Yvette also implemented follow-up activities after key assessments to engage students more deeply with the targeted concepts. For example, she often had students work collaboratively in small groups, record their discussions about concepts covered in the assessments on small whiteboards, and then share their reasoning with the whole class.

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LEADERSHIP



Learning To Exhale

BY REGINA VAN WEY

There is a program in the state of California that has been around for more than 20 years – which is remarkable since it has been funded with only grant money the entire time! It is, of course, the K-12 Alliance!

For 10 years, I have had the privilege to work with the K-12 Alliance – I’m happy to report that this group of top educational leaders has positively influenced my teaching career and teachers across the state.

I can honestly say that if it were not for being part of K-12 Alliance, and because of their leadership, guidance, support and encouragement, I would not be able to stand up and talk in front of a group. Now, I am not talking about in front of a class full of students, I’m referring to adults. The big people.

The K-12 Alliance knew me when I would try to talk in front of a group and all I could do was inhale – no exhaling. If you have ever tried to talk by just inhaling...try it just once and you will know what I mean.

Learning how to be confident in front of groups also helped me become a better teacher and a teacher leader. The Teacher Learning Collaboratives (TLCs), have helped me understand the need for coming up with the “Big Idea” to help the students grasp the standards and concepts. Constructing a conceptual flow is key to increasing student understanding.

TLCs also helped me by reinforcing my desire for teacher sharing. It allowed opportunities for me and my fellow colleagues to learn how not to stay in our rooms behind shut doors but rather how to collaborate with each other. For some, this was a hard thing to do but once done, it became a major breakthrough in our teaching.

The TLCs also provided a process to link together like minds in our department and it’s also now providing a connection across our district in our District Curriculum Committee in Science. We are using the process of collaboration, conceptual flow and facilitation to create a new curriculum map (i.e., conceptual flow) district wide.

Through the K-12 Alliance, hundreds of teachers across our state have become better teachers and life long learners in the educational field. I have met teachers up and down California during staff development training sessions as we create new sessions for our summer institutes. These folks are my daily inspiration.



I appreciate the leadership of K-12 Alliance for its tenacity and clarity of purpose through the rough and smooth times. Without the K-12 Alliance leader-

ship, science education would not be as prominent today in California or nationwide.

Our jobs as teachers, after all, is to bring the wonders of the world to our children – and by doing that, we

enrich our own lives as well.

TEACHING & LEARNING



Journals As Bridges

BY COURTNEY YOUNG

Science instruction at the elementary level is evolving – and so has science journals. Elementary teachers are discovering that modeling and using science journals are great tools for students who can learn how to synthesize information into bigger conceptual ideas, i.e. The Big Idea Thesis.

In my classroom at Jackson Elementary School in San Diego, I have broken down The Big Idea Thesis into four stages; Introduction, Development, Encouragement, and Autonomy. It’s the whole I.D.E.A. (Get it?)

To begin, students are introduced to the purpose of this practice and must think of themselves as young scientists and, like professionals, they must use evidence to comprehend the world around them. I even present the same Big Idea Thesis chart used at the middle school level.

The second stage is Development where together we develop our ability to use “real” scientific methodology. I like to use such techniques as think alouds, shared experiences, modeling, science notebooks and interactive class charts.

For example, the class fills in the blanks on our classroom chart while documenting our collection of evidence from personal notebooks. With each lesson, reading, investigation or visual, we ask ourselves how the experience helps us to answer our big idea trigger question. Together, we journal the acquired evidence.

The third stage is Encouragement. Once the students have developed the basic practice of being a young scientist, I begin to pull back on the modeling and encourage each student to put what they learned into practice.

At this stage, students know how to question as well as gather and synthesize data to draw conclusions. Students learn to ask themselves and one another “How do they know what they think they know?”

Here, I notice the beginnings of the critical thinking! It’s exciting to walk around the classroom, glance at notebooks and listen to their conversations.

Finally, the fourth stage and goal for this process is Autonomy. I know students have reached this stage because of their behavior and journal notes. Students learn to document and then compile evidence from multiple sources.

Overall, these four stages are not time specific. I realize that students advance at different levels, so it’s necessary to differentiate when immersing students in the journals. I use small groups to teach and/or re-teach mini-lessons as well as to model and guide students through the use of the science notebooks. During small group instructional time, other students work independently or in partners to journal their evidence gathered from previous activities.

My goal is for students to make connections in science and learn to collect evidence to gain knowledge of science concepts. I plan with purpose, present experiences to the students and modeled thinking that requires connection, documentation and data collecting.

The work of The Big Idea Thesis begins at the elementary level which sets the stage for students to be better equipped to take on the challenges presented in middle school.

More importantly, the application of The Big Idea Thesis creates critical thinkers that question life and use data to make conclusions about the world around them.

Using science journals is just one way we educators can bridge instruction between elementary and secondary schools which can only further create optimal science instruction in our schools, districts and state.

Courtney Young is a fifth grade teacher at Jackson Elementary in San Diego and a K-12 Alliance staff developer.

COLLABORATION



A Night For Science And Families

BY STEVE PETRO

“I am among those who think that science has great beauty. A scientist in his laboratory is not only a technician: he is also a child placed before natural phenomena which impress him like a fairy tale.”

— Marie Curie (1867-1934)

Science is one discipline that can excite and motivate children, and “Family Science Night” provided just that for the Julius Corsini families and students in Desert Hot Springs.

Integrating many of the disciplines of education, science is one area that allows students to have a hands-on experience while being constructive and creative. Science really is a total mind workout!

With the theme of “scientific process,” Science Night welcomed almost 400 people on a chilly, breezy Tuesday evening. To start off, each family received an eight-planet passport card and directions to visit eight locations.



TASTE BUD TEST — Science Night participants got to decide what made a more delicious sugar cookie.

After visiting each location, families were given a “secret” clue word to be placed under one planet on their passport card. Clue words spelled out questions and correct answers allowed family members to enter the drawing for the later *Deal or No Deal*-type game.

Activities abounded at Science Night. Families were involved in a cookie tasting experiment which, in keeping with the scientific process theme, asked participants: Which cookie (sugar or sugar-free) tastes the best? Interestingly, the sugar cookie barely won by a 116 to 89 votes.

Several rooms displayed science fair projects which covered such topics as the cleanliness of food dropped on the floor, battery brand testing, the strength of metal pipes and the effectiveness of hand washing.

The Astronomical Society of the Desert provided several telescopes to look at Venus, Saturn, the Orion Nebula and other bright stars. Several rooms had science experiments that were ongoing such as magnetism and samples of soil. A power point using pictures from the Hubble telescope mixed with the music from *Star Wars* added to the “oohs and ahs” heard that evening.

The evening closed with students receiving candy bars with space themes like Milky Way or Starburst. About 60 other prizes — many donated by local merchants — were distributed in bags.

Some winners were invited to play *Deal or No Deal* to exchange their bag for what was behind a numbered black case that included prizes valued up to \$100. It was a fun-filled, nail-biting experience.

Overall, this successful event gave families a connection with the school as well as with each other as they explored science as “a natural phenomena.”

Steve Petro is a husband volunteer for the Science

Teachers In Institute-Land

Up and down California, more than 1,000 teachers left their families, home and loved ones this summer to participate in K-12 Alliance institutes.

Work? Vacation? Well, Institute-Land was both with educators sharing, networking and learning from one another in a professional – yet a lively and social – setting.

Math and science teachers from fourth through ninth grades were immersed in rigorous content; university professors teamed up with elementary and middle school teachers to plan and deliver content using research-based pedagogical strategies.



HOT TOPICS — Discussing Earth science's hows and whys are (from left) Dennis Kurtz (Hollister School District), Craig Poole (Fresno City College) and Kathy DiRanna of the K-12 Alliance in Tulare's air conditioned coolness.

Institute-Land is designed to provide teachers with rich content that relates to the content they teach their students. Time is devoted to teaching strategies that promote student understanding of complex concepts. "Ask, Don't Tell" is a key phrase, so teachers learn how to sharpen their questioning skills by asking higher levels of questions and various types of questions.

Using "Accountable Talk" provides students with structures to communicate with each other in a meaningful way and deepen their understanding of concepts.

Here is a recap of the many adventures that were found in this summer's Institute-Land.

► **LAKE Science Collaborative** invited 38 fourth, fifth and sixth grade teachers from Lake County at the McLaughlin Reserve for a week-long Earth science institute in collaboration with Sonoma State University.

Participants learned about minerals and rocks and plate tectonics in addition to the how convection is the driving force of the water cycle. Finally, teachers explored the local resources of Lake County and studied hydrologic processes.

► **Science Success for All in Marysville** focused on Earth sciences, specifically the water cycle, rocks and minerals and land forms. Participants got wet, scratched things, played with rocks and enjoyed the beautiful grounds of participating partner, Yuba College.

The high point of the week was a one-day field trip that spanned valleys, mountains and sea.

► In **Tulare**, cows were swishing their tails to keep cool, but in a new school building, 43 returning lead teachers networked in air-conditioned coolness as they learned content from the cadres.

Topics included: What is a cell and why is it important? Plate tectonics and rock processes -- are we really moving? Chemical reactions, how do they happen?!

Highlights of the week included a geology trip to the Sierra Foothills as well as a visit to a food processing plant to examine chemical reactions in action.

► Teachers from **Montebello Unified and Garvey** school district came together at the De Paul Center to explore such diverse topics as Earth processes, force and motion, size and scale in nature, and slope in mathematics.

While deepening their content knowledge, the participants also sharpened their pedagogy and leadership skills. The week ended with the participants presenting conceptual flows created from their new instructional materials and a 5E lesson from those flows.

► This summer **Vista and Escondido** math teachers took a journey into numbers. Cadre members Tejinder Neelon, Rich Deem and four site coaches led participants through activities delving into the mysteries and power of numbers. From counting to encryption, numbers are central to modern life and middle school math classrooms are where number magic is discovered, uncovered and, of course, tested.

► The **Palm Springs CaMSP** completed a second summer of mathematics-focused conversation. California State University, San Bernardino and College of the Desert's mathematics faculty provided content background for teachers. A major focus of the program was using assessment to guide instruction. This math institute "all adds up" to a new quality math program.



BLENDING SCIENCE, ART AND LITERACY — Staff Developers Mike Hays and Gina Walker from Tulare City School District picked up a forest full of content tips at this year's summer institute.

► Coachella Valley is a "hot – hot" place in the summer and this year it sizzled with science. More than 100 teachers from **Coachella Valley Districts of Coachella Valley Unified, Palm Springs Unified** attended the two-week science institute.

Highlights of the program included sessions on life, Earth, physical science for elementary as well as a "global warming" seminar for secondary. Coachella Valley teachers from K-12 have developed a wonderful learning community throughout the desert region.

► The July heat made it easy for teachers in **Lodi Unified** to come inside for the third year of the CaMSP grant. Fourth and fifth grade science teachers and sixth through eighth grade math teachers attended five days of a summer institute held at Christa McAuliffe Middle School.

The cadre, including professors from the University of the Pacific, offered life science content and number theory, as well as involving teachers in the

cycle of inquiry as they prepared and planned for the new school year.



EARTH SCIENCE SPOTLIGHT — Marysville Institute welcomed content-minded teachers, including (from left to right): Carolyn Xiong, Cedar Lane Elementary; Kyle Sweeney, Kynoch Elementary; Heather Van Gilder, Kynoch Elementary; Michael O'Brien, Cordua Elementary; Nou Xiong, Cedar Lane Elementary; and Lisa Shaw, Ella Elementary.

► A newly funded mathematics CaMSP in **Lincoln Unified School District** got underway this summer in Stockton. Seventy-seven fifth grade through Algebra I teachers attended two, 3-day summer institutes. The first emphasized increasing teacher content knowledge teachers talked, figured, worked, and were engaged in thoughtful mathematics.

Content for the Classroom was a focus for the August program that had grade level colleagues designing mathematical tasks that promote a higher level of cognitive demand. Committed district support for this project has been vital to its successful first year!

► The **Pasadena Pipeline**, one of the 64 CaMSPs, brought together 40 teachers for two weeks of intense content and pedagogy professional development in mathematics at Sierra Madre School in Pasadena.

Cadre members from California State Polytechnic University, Pomona, and the K-12 Alliance, along with five Pasadena USD coaches, helped teachers stretch their content knowledge as both learners and teachers.

Participating teachers will continue their summer work through Teaching Learning Collaboratives (TLCs).

► "Inquiring Minds Want to Know" was the theme of **Rialto's** fourth content institute. Teachers explored the investigation and experimentation standards in their newly adopted Macmillian Instructional Materials.

Fourth grade teachers used life science standards and fifth grade teachers used physical science standards; both integrated the I and E standards into their work.

► One hundred eighty K-8 teachers in **San Diego Unified School District** experienced an awesome Summer Institute focused on optimal student learning for all students.

The overall theme of the institute was environment preservation, "Fun With Flora" and energy conservation "Energy Enlightenment." Sessions provided science content and pedagogy.

Schools receiving Garden Grants attended a session to learn how to use their gardens as an instructional tool for student learning. Teachers attending the physical science strand learned about energy and indications for conservation.

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Use Evidence to Refine Assessments.

When Yvette worked on an assessment, she reflected, "What do I really need to know about my students' understanding at this point?"

Yvette became increasingly interested in assessments that revealed students' conceptions of scientific ideas as opposed to those that simply resulted in right or wrong answers. She developed more open-ended tasks aligned with the core science concepts in the unit, and she strengthened the criteria for scoring responses to capture a range of student understanding.

Summary

Yvette used the ACT Portfolio process to strengthen her assessment knowledge and practice.

"[I will take away from this experience] the way that I look at students' work, the way I will strategically grade students' work and give feedback, and the amount of time that goes into planning assessment. Enough time needs to be given to how students will take the test and then how you will grade the test and then how you will give feedback on their results from the test."

While Yvette learned all of the above and more, she also recognized that her learning was incomplete — and that recognition is the hallmark of a reflective practitioner.

To that end, Yvette developed a commitment to life-long learning and ongoing professional development; and she understood that a reflective practitioner continues to seek out resources and opportunities for collaboration throughout his/her teaching career.

In our next articles, we will share some of the processes and tools that can help you become a reflective practitioner.