

Connecticut Science Supervisors Association



Newsletter

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President's Message

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For a small state, we have surprisingly large opportunities for science education in Connecticut. We are fortunate that the Connecticut Science Center (CSC) opened its doors about a year ago in Hartford, and even more fortunate that they started a professional development effort over five years ago, before they even started construction on their building. They brought the well-researched teaching pedagogy on using Inquiry from the Exploratorium Museum in San Francisco. Prior to this, Connecticut teachers had to travel for a full week to San Francisco to become immersed in Inquiry. Better still, for alumni of the Inquiry training, there are two follow-up days at the end of June each year to come together and share experiences and best practices.

We have not one, but TWO Aquariums in our state. For those on the eastern end of the state, the Mystic Aquarium offers teacher workshops and fascinating field trip opportunities. For those on the western end, the Maritime Center in Norwalk offers similar opportunities and also educationally based feature-length IMAX films. There are multiple museums dedicated to kids. The Children's Museum is in West Hartford, with another Children's Museum in Eastern Connecticut and the Children's Building in New Haven. Stepping Stones Museum in Norwalk is well suited for young children. The Peabody Museum in New Haven is appropriate for children of all ages, as is the nearby Beardsley Zoo. If you live in the northern part of the state, then there's always Action Wildlife in Goshen. There is Dinosaur State Park in Rocky Hill (<http://www.stateparks.com/dinosaur.html>) and then there are at least forty other state parks, state

forests, and state wildlife areas that are listed and linked to that website. There's a Connecticut River Museum in Essex and there's the Discovery Museum in Bridgeport. Something for everyone - and field trips for all!

The reason I'm specifically thinking about field trips for this issue of the newsletter is that in the Fall of 2011, October 27-29 to be exact, Connecticut will again be hosting a Regional NSTA Conference. This is very exciting to be hosting again, but it takes a lot of work and preparation by many people serving on many committees. It takes a lot of volunteer effort. We will seriously need YOUR help (yes, even a year in advance). Please contact a board member to see how you can become involved in the planning for the next NSTA Conference.

Speaking of large opportunities, this one is HUGE. As science supervisors, we are always advocating safe practices. Know what the risks are and how you can minimize them. Don't let the tight fiscal budgets deter

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your district from teaching science in which the students have hands-on experiences. Is your school's Chemical Hygiene Plan up to date? Do you know who your Chemical Hygiene Officer is? Through a collaboration of CSSA, CSTA, the CT Academy, CT SDE, the CT Valley Section of ACS, PIMMS, and thanks to generous underwriting from the Connecticut Interlocal Risk Management Agency (CIRMA), the CT Safety Network is offering two one-day workshops on May 18 and May 19 for district or school teams to update their safety practices. The featured presenter is our own Dr. Kenneth Roy, who in addition to providing us with safety articles for each newsletter edition is a national OSHA safety presenter. This workshop is invaluable in helping you to avoid negligence and accidents in the first place. It is worth its weight in gold, but it is FREE to the first who sign up for it. There's a link to the brochure from CSSA's website, http://www.cssaonline.net/Chemical_Hygiene_Workshop_Brochure.pdf We are planning for additional dates and related workshops next year as well.

I had the privilege of presenting an award to the Glastonbury Board of Education on April 12th. This award was an acknowledgement that Fred Myers will be receiving the Fred J. Scimone Award for Outstanding Supervisor at our upcoming Awards Banquet on May 12th. I addressed the board and thanked them for their support of Fred, which in turn has allowed him to be supportive of science education regionally, statewide, and nationally. Fred is a deserving recipient of the award that he'll receive in two weeks, but his Board of Education, and particularly the Assistant Superintendent, were impressed that CSSA would send someone to their Board meeting and thank THEM. They appreciated the acknowledgement that in our current economic climate, while every district is looking for places to trim their

budgets and cut expenses, they made a choice to retain their science administrator. It is a wise choice, and one we hope that every district would make, but it is not without its critics. In a zero-sum-game, rob-Peter-to-pay-Paul environment, there are few win-wins. If you are feeling like your district needs a reminder about your value as a science supervisor, invite your superintendent or assistant superintendent or board member to attend the Chemical Hygiene Workshop as part of your district team. Another great resource to share with your district is the White Paper on Science Supervisors that we produced several years ago, and which can be downloaded from our website (see "Position Papers" in the left-hand column). Among our goals as an organization, we are committed to serving as a public advocate for science education in Connecticut. Let us know when you see additional opportunities to fulfill this and other goals.

Please keep your eye out for an upcoming e-mail that will poll our members' needs for PD through a "Needs Assessment Survey". This past year, we started strong with a full-year workshop series to provide research and practice on effective professional development to those who are expected to lead professional development in their districts (chosen as a result of responses from the Spring 2009 Needs Assessment Survey). Due to low pre-enrollment numbers, (and the unpredictable weather in the winter months) we had to cancel several planned sessions. We hope that you will give us clear feedback on what workshops you would find most valuable as we plan our next year's pre-dinner workshop series. We are already booking keynote speakers and sponsors for next year, and we want to get this right. CSSA is YOUR organization.

Pre-dinner professional development

The professional development subcommittee whose members include: Harry Rosvally, Melinda Meyer, Holly Harrick, Tammy Mockus, Marilyn Odell, and Sandy Justin will facilitate this afternoon's workshop.

About Tonight's Speaker

Susan Mundry is the Deputy Director of Learning Innovations at WestEd and Associate Director of WestEd's Mathematics, Science, and Technology Program. She has been helping new teachers, principals, and administrators become more effective leaders in science and mathematics for over 20 years.

Mundry codirects the agency's National Academy for Science and Mathematics Education Leadership, providing professional development and support for education leaders nationwide. Mundry consulted on the design and implementation of the Academy model for the states of Texas, Maine, Pennsylvania, and Illinois. She is leading a research study examining the distribution of highly qualified teachers in New York and Maine for the Regional Educational Laboratory Northeast and Islands. She also serves as Project Director for the evaluation of the Intel Mathematics Initiative, a professional development program for elementary and middle grades teachers in Massachusetts and California aimed at increasing student outcomes in mathematics.

She coauthored the best-selling book, *Designing Effective Professional Development for Teachers of Science and Mathematics*, as well as *Working Toward a Continuum of Professional Learning Experiences for Teachers of Science and Mathematics*, *Designing Successful Professional Meetings and Conferences in Education*, and *Global Perspectives for Local Action: Using TIMSS to Improve U.S. Mathematics and Science*. Mundry also coauthored the award-winning *Leading Every Day: 124 Actions for Effective Leadership*, now in its second edition. Her latest book is *The Data Coach's Guide to Improving Learning for All Students*.

Mundry received a BA from the University of Massachusetts, an EdM from Boston University, and a Graduate Certificate in Management from Lesley College.

Editor's Corner: Observing Effective Questioning in the Science Classroom

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Note: This article is cross-posted on my blog: <http://problemfinding.labanca.net>. Be a part of the discussion, join my personal learning network, and leave a comment on its contents there.

On March 13, 2010, the Obama Administration released its strategy for revising the Elementary and Secondary Education Act (ESEA), also known as No Child Left Behind. The blueprint, in part, focuses on the development of effective teachers and leaders. The plan requires states to define an effective teacher, effective principal, highly effective teacher, and highly effective principal. Definitions are to be developed in collaboration with teachers and leaders, based in significant part on student growth and other measures such as classroom observations of practice.

The ESEA contains expectations that district level evaluation systems

- meaningfully differentiate teachers and principals by effectiveness across at least three performance levels
- are consistent with their state's definition of effective teacher and highly effective teacher and principal
- provide meaningful feedback to teachers and principals to improve their practice and inform professional development
- are developed in collaboration with teachers, principals, and other education stakeholders

How do we, as science education leaders operationalize these broad statements and translate them into meaningful methods to assist in teacher growth and improvement? I think at times, it is necessary to step back and examine how we can compartmentalize the instructional process for the purpose of identifying an area to focus efforts to help teachers improve. Certainly instruction is a very holistic process, but targeting specific teaching skills in the instructional toolbox can give teachers meaningful feedback to improve their craft. My focus here is on effective oral questioning.

Questioning in the classroom is vital to help students develop problem solving and critical thinking skills. To frame this discussion, it is important to consider the different types of questions that a science teacher might ask students (or students might ask teachers). I would classify them into three major categories:

- FACTUAL
- CONCEPTUAL
- ANALYTICAL

Factual questions are just that: checking facts. Factual questions are composed of isolated information that stands alone and is generally much lower on Bloom's Taxonomy (knowledge/comprehension). Conceptual and analytical

questions, though, would fall under higher order thinking skills questions. Conceptual questions are ill-defined, allowing students to connect ideas together and draw on knowledge to formulate an answer, while analytical are well-defined, challenging students to interpret information or data, and make calculations. Both are more inquiry-based but a conceptual question can have multiple possibilities (i.e., the BEST answer), where a well-defined analytical question has one right answer (i.e., the CORRECT answer). Of course, all types of questions are necessary, especially to scaffold student learning, but are a variety used effectively and judiciously?

As I observe teaching and learning, I often find myself asking many of the following questions: Who (teacher/students) are asking the questions? Are a variety of students participating? Does the teacher answer student questions or does the teacher turn them back to the class for a response? Is appropriate wait time utilized? If a HOTS question is too difficult to answer, does the teacher rephrase or scaffold to provide a structure for student success? What types, in what frequency, and in what proportion are questions being asked by students and teachers?

Teacher	
# HOTS questions	# K/C questions
Student	
# HOTS questions	# K/C questions

If inquiry is learning by questioning and investigation, then effective oral questioning in a science class is critical to the development of student inquiry skills. Helping teachers develop their classroom questioning skills is a necessary and important part of professional mentoring for growth and development.

Safe Science: Be Protected!

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FIELDING SAFETY!

I. Why Do A Field Experience?

Learning science is doing science! The best way to learn science is by doing hands-on, process and inquiry based learning activities. Working in the field as opposed to the formal academic classroom is a means to that end. Students should have as many field experiences as possible in concert with their classroom studies. The extent of field experiences depends on the age of students/grade level, school policies and available resources. That can range from working on school grounds to taking hikes in a pasture, woodland or other types of more challenging terrain. However, no matter where the experience is, a successful field experience is a safe field experience. So what types of considerations should the teacher of science address to secure a safer learning experience in the field?

II. Safer Science In The Field!

The following items provide teachers of science an introduction to planning for a safer field experience. It is a point to begin and certainly should have additional considerations depending on age of students and location of the field experience to mention a few.

LET THE LIST BEGIN!

- **WALK-THE-WALK:** Always walk-the-walk before taking a field trip with students. Know the terrain, hazards, etc. and be prepared for them. Hazards including broken glass, trash, branches, insects (bees, mosquitoes, ticks), wild animals, poisonous plants (poison ivy), and unlevel ground should be considered.
- **PERMISSION SLIPS:** Make sure student permission slips or acknowledgement forms are provided for parents/guardians to sign, acknowledging the specifics of the trip and academic purpose. Also note what is being done to make it a safer trip.
- **SAFETY TRAINING:** Provide basic safety training for all participants BEFORE the field trip starts. Include such things as overview of the trip, what happens if a participant is lost, injured, medical issues, avoiding unsafe terrain, and communications, to name a few.
- **APPROPRIATE CLOTHING:** Appropriate clothing depends on trail conditions and the season. All participants should make sure their bodies are completely covered below their neck – long sleeve shirts, pants, close toed shoes or boots,- jackets and gloves if necessary.
- **SUN-WISE:** All participants should have on hats, sun glasses and sunscreen when in the field to prevent overexposure to UV rays.
- **WEATHER-SMART:** Make sure you have checked the weather forecast before moving into the field. Never take the trip in inclement weather. Also be aware of unpredictable weather such as thunderstorms or wind storms.
- **FIRST-AID:** Make sure someone is trained in first-aid procedures in case there is an incident requiring medical attention. Also have a list of medical needs for all participants, including the necessary medications.

- **ITINERARY:** Make sure the school knows where you are going and when you plan on returning in case there are issues or problems.
- **TOGETHERNESS:** Always travel in a group or groups – never alone! Develop a formal buddy system for all participants.
- **REST & WATER:** Participants should have rest time when walking long distances. Also make sure water and snack food for energy is available.
- **COMMUNICATIONS:** Whistles for each participant, cell phones or walkie-talkies for group leaders are helpful for communications, especially in emergencies.
- **PERSONAL HYGIENE:** Make sure appropriate toilet facilities are available on long hikes at appropriate intervals. Also, have either soap and water or antibacterial wipes available for use.
- **STORM PLAN:** Have a plan in case an unexpected thunderstorm, windstorm, or other natural event should appear. Review basic behavioral procedures with all participants fostering best safety practices.
- **TRIP KIT ITEMS:** In addition to a general first-aid kit, consider bring a trip kit with the following items: extra clothing for warmth, compass, extra food, flashlight, insect repellent, map, pocket knife, pocket mirror, trash bags, water, extra whistles.

III. In The End!

Remember – the field experience for student learning is priceless! So is the safety! It doesn't matter if the trip is for five minutes or five hours. Try not to have any surprises which you did not anticipate. Planning will not eliminate all possible surprises but certainly will make it safer for all participants!

LIVE LONG AND PROSPER SAFELY!

REFERENCE:

Health Canada: <http://www.hc-sc.gc.ca/hl-vs/securit/season-saison/summer-ete/outdoors-pleinair-eng.php>

USDS Forest Service: <http://www.fs.fed.us/recreation/safety/safety.shtml>



How Connecticut Ranks 2010

Significant Educational, Demographic or Economic Indicators (latest)			
Rank	General Demographic Indicators (latest available)	Connecticut	Total U.S.
29	Population as of July 1, 2009	3,518,288	307,006,550
28	Civilian labor force, Dec. 2009 (thousands)	1,883	153,203
2	Personal income per capita, 2008 (\$)	\$56,272	\$40,208
24	High Tech Employment, 2006	68,123	5,766,327
32	Number of Public Elementary and Secondary Schools 2008	1,135	101,757
25	Pupil / Teacher Ratio 2007-2008	14.5	15.47
Latest Educational Scores for Science & Math NAEP Scores (National Assessment of Educational Progress) ¹		NAEP 2009 Scores for Science & Math to be released in 2010	
9	2009 Grade 8 Mathematics Average Score	289	282
9	2009 Percentage "At or Above Proficiency" in Math	40%	31%
23	2005 Grade 8 Science Average Score (or latest)	1523	147
ACT Scores 2009 ²			
3	Connecticut's 2009 Average ACT Science Score	22.6	20.9
2	Connecticut's 2009 Average ACT Math Score	23.5	21.0
38	Percentage of Graduates Taking ACT in 2009	21%	45%
SAT [®] Scores & Advanced Placement (AP) Percentages 2007			
32	Connecticut's Average Mean Score for SAT Mathematics 2009	513	515
4	Connecticut's Percentage of Graduates Taking SAT Mathematics 2009	83%	46%
11	AP Math Exam — Percentage of High Schoolers Taking 2007	10.5%	9.4%
7	AP Science Exam — Percentage of High Schoolers Taking 2007	10.5%	8.1%
College Readiness Indicators: % ACT-Tested Students ²			
2	ACT Math — % of H.S. Graduates ready for College Level 2009	63%	42%
3	ACT Science — % of H.S. Graduates ready for College Level 2009	41%	28%
Teacher Quality Indicators (K-12) 2008 ⁴			
16	Percentage of Middle Level Science Teachers Certified	61%	54%
15	Percentage of Middle Level Math Teachers Certified	60%	49%
7	% of H.S. Chemistry Teachers with Main Certification in Chemistry	82%	53%
2	% of H.S. Math Teachers with Main Certification in Math	96%	79%
NCES Key Educational Statistics — Public Schools (latest) ⁵			
4	Expenditure per Pupil 2007-2008 School Year	\$13,660	\$9,154
29	Enrollment in Public Elementary & Secondary Schools 2007-2008	570,626	966,519 av.
49	Low-Income Students, 2006-2007	26.5%	40.9%
24	Limited English Proficient, 2006-2007	5.2%	8.5%
35	Percent of Students in Title I Schools 2007	41.9%	49.3%
13	Number of H.S. Students who Graduated as Reported by State 2007	88.8%	86.5%
28	Number of Full Time Equivalent (FTE) Teachers, 2006 - 2007	39,115	3,181,494

K-12 Science & Math Education is Essential for a Skilled Workforce. Of the 30-fastest-growing occupations projected through 2016, the U.S. Bureau of Labor Statistics' *Occupational Outlook Handbook* concludes that 16 of them will require substantial Mathematics or Science preparation. Sources: 1. U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences, National Assessment of Educational Progress (NAEP) 2007 (*Mathematics*) and 2005 (*Science*). 2. ACT, Inc.; 3. The College Board; 4. Council of Chief State School Officers (CCSSO) and State Departments of Education, Data on Public schools, 2007-2008; and 5. U.S. Department of Education, National Center for Education Statistics (NCES).



** rankings include the District of Columbia

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CSSA Officers for 2009-2010

President	Harry Rosvally <i>Danbury Public Schools</i>
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