December 2009 Vol. 115

Science Teachers' Association

Greetings From the President's Desk

Greetings on this fine winter day as we endure the first real winter of the season- below zero wind-chills and possible late school starts. Actually sometimes I wouldn't mind a late start!

I attended a leadership meeting after the NSTA Regional Conference the last Saturday and Sunday in October in Minneapolis. Our SDSTA President- elect Molly TenBroek also attended on Saturday. The meeting was for officers from the three state area of North Dakota, South Dakota and Minnesota. These three states compose the region of the NSTA- District IX and our District Director is Paul Keidel. Paul is from Bismarck High School in Bismarck, ND and he arranged the meeting. The current president of NSTA, Pat Shane, and the current past President of NSTA, Page Keeley and the current President-elect of NSTA, Alan McCormack attended the meeting and spoke to us. The Associate Executive Director of NSTA, Ed Rock also gave ideas on finance and fund raising. All four of these national officers are very cordial, helpful people and it was very good to meet them. Paul presented several slides showing a variety of provided for teachers by the NSTA at the NSTA website. Some of the resources are for members only but a surprising number of resources are available free for any teacher. Paul will be presenting at our conference and I recommend your attendance- you will be pleased to see the wide variety of easily accessible and usable resources. The meeting was most informative and I am glad I attended.

Speaking of our conference, the featured speaker at the banquet is a NASA scientist, Keith Van Tassel. Keith is a pyrotechnics engineer for NASA and currently the Project Manager for Pyrotechnics and the JSC Explosives Officer. He grew up in Redfield and Watertown and graduated from Watertown High School. In this role his working group provides pyrotechnic devices and testing for the Space Shuttle and the Constellation Programs. He will be speaking at the banquet and also giving presentations during the day on the relationship of his work to math and science education. We've also invited Andrew Weaver from Stillwater, MN. to be a part of our conference. Andy is a true teacher's teacher. He teaches biology, AP Biology and Field Biology at Stillwater High School as well as Prairie Ecology, Field Biology and Ornithology through Hamline University. The latter courses are designed for teachers and I have had the good fortune of taking two of these classes from Andy. They were wonderful courses. Andy has a wide variety of interests. He is a master falconer and promises to bring a bird or two to the conference, is actively involved in prairie restoration and teaching about prairie restoration, is a bear hunter, a triathlon runner, raises German Wire-haired Pointers and is a knife maker -- to name some of his outside interests.

Our 2010 conference is an even year and so our SDSTA membership will be voting on new officers that will include the positions of treasurer, president-elect, and secretary. Please plan to attend the business meeting on Friday afternoon and cast your vote. To make our organization viable and stronger we need members to step forward and seek to be actively involved.

I also attended the Presidential Awards Coordinators' meeting in Washington DC in mid-October. Some new changes have been implemented by the NSF, who administrators the program for the President. David Ireland, 6th grade teacher from Rapid City Middle School is the 2008 awardee from South Dakota. His trip to Washington for recognition week has been set for January 2010. The recognition is much later than usual but I am truly hoping David will find the wait worth it as the gentleman who spoke form President's Office of Science Affairs assured us that President Obama wants to have time to visit with the teachers- more than just for a photo as in the past. Please consider nominating a worthy colleague for this prestigious award. Nomination forms and application information are available at www.paemst.org. ***(Continues on Page 2)***

(President's. Letter continues)

I recently saw an article in the Minneapolis paper stating that 14 universities and private colleges have been awarded a portion of a multi- million dollar Busch Grant to improve teacher preparation education in North Dakota, South Dakota and Minnesota. The University of South Dakota has been awarded one of these grants. It is estimated that 20,000 teachers will be retiring from the tri-state area in the next 10 years and concern about replacements is the emphasis of this grant. Dr. Rick Melmer, Dean of the School of Education at USD, says this grant will have a very positive impact on teacher education at the University. We have to be watching and perhaps be a part of these changes.

In the latest NSTA reports is an article from NSTA President Pat Shane. The article is entitled Science Matters: Respect Makes It Happen. I have condensed her ideas but the article is based off the notion of "it takes a village to raise a child". This same concept is true in science education: It takes an entire community to raise a scientifically literate citizenry. Everyone's contributions are necessary in this effort to increase respect/support for science. If the community is to act like a family, then each segment needs to contribute. Teachers need to help colleagues, especially those new to a school. One major reason teachers give for leaving a school is the lack of collegial support. Support and the school walls. Students, their parents and other caregivers are also accountable. Parents need to show respect by encouraging their children to complete assignments. Business and community groups need to also be a part of this supportive community. Businessesrespect inherent in it, can be demonstrated by veterans helping new colleagues.
Another reason teachers give for leaving a school is the lack of administrative support and administrators need to acknowledge and change this. Pat goes on to say that the responsibility for developing scientific literate students goes beyond the have a tremendous stake in the school and their involvement must be comparable. Business can encourage employees to volunteer, give employees time to attend conferences and school activities that are during the day, perhaps provide tutors, etc. Pat concludes by saying that, "With the proper respect and the whole village working together, we can help each child change the world for the better." I believe we are fortunate in South Dakota because the majority of our community does respect science and value science education for their children.

This is the last newsletter I will be writing as President of SDSTA. I have enjoyed being able to serve in this role and very much appreciate the support of the current officers of SDSTA and the support of the membership of SDSTA. I would also like to thank the officers of the South Dakota Council of Mathematics for the good work they do and the hours given by the officers of both organizations. It seems like this two years went by very rapidly and I look forward to serving SDSTA/NSTA in any way that I can in the future.

Respectively, Ramona Lundberg
S D S T A President
Feb. 2008-Feb. 2010

Periodic Table Activity

Students can look at charts and do experiments to determine periodic table trends. The website www.Ptable.com developed by Michael Dayah provides a very quick acting resource with just about anything you want to know about the elements such as family properties, electron configurations, to isotopes complete with method of decay. There are links to Wikipedia for further information. I've included an activity entitled "Periodic Table" ***(on pages two & three)*** for students to study trends and properties of the periodic table. For the last questions dealing with atomic and ionic radii, just Google "ionic radii chart" under images.

February 2010 is an election year for SDSTA.

The Treasurer and Secretary serve two year terms (and may be re-elected once). The President-Elect serves a two year term, then is President for two years & then is Past-President.

If you know of someone that would make a good officer, please let Past-President MichelineHickenbotham@bhsu.edu or any officer know so that we may contact them to see if they would accept the nomination .

Hope to see you in Huron, Friday, February 5 @ 4:30

Periodic Law Lab

Answer the questions at the end of each section of the lab activity. In each case, refer to the Periodic Table and look for patterns within groups or periods as you test each property. It is very important to record your observations. Indicate those patterns on the blank Periodic Table provided too.

Part A: Solution Color of metal salts

Using a small amount of chemical (no larger than a BB), make a 1 mL solution (by adding to 1 mL of distilled water) of each of the following in their own clean test tube. *make sure you are using compounds NOT elements!

1. copper nitrate
2. iron III chloride
3. manganese chloride
4. calcium nitrate
5. sodium nitrate
6. magnesium nitrate
7. aluminum nitrate
8. chromium nitrate
9. gold chloride (**demo only** on the teacher's desk)
10. lead nitrate

Questions:

1. Record the colors of the solutions.
2. How do you know that the color is being produced by the underlined element rather than the nitrate or chloride anion?
3. Elements that tend to produce colored solutions are located in what specific area of the periodic table?

Part B: Density

Determine the density of the each of the following elements. Return the sample to its container when you are done. Make sure to dry it off before placing it in the container.

1. lead 2. silicon 3. tin

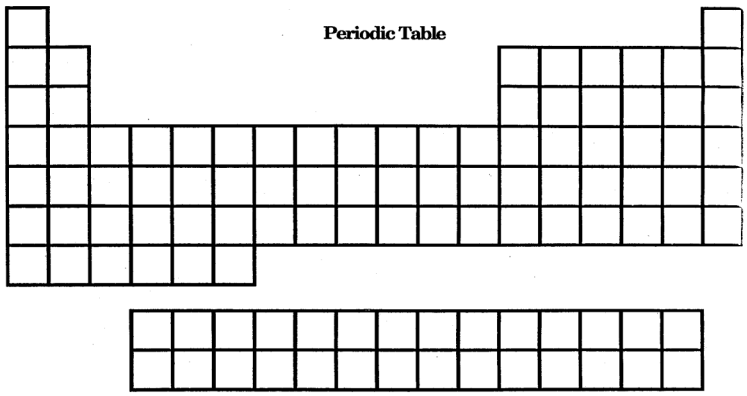
Questions:

1. Record the density of each element with appropriate units and significant digits!!!
2. What is the number of the group in which these elements can be found?
3. According to the results of this experiment, what happens to the density of elements as you go down a family/group?

Part C: Reactivity

Determine the relative reactivity of each of the following elements with water.

1. Your teacher will demonstrate sodium and potassium.
2. Put distilled water into a test tube until it is half full. Warm the water by gently heating the test tube over a Bunsen burner. Remember safe heating procedures!
3. After heating, place a small sample of magnesium (the element! Not the compound) in the warm water. Record any evidence of a reaction.
4. Repeat steps 2-3 with calcium metal. Record your observations.



Questions:

1. Sodium and potassium belong to which family?
2. Magnesium and calcium belong to which family?
3. According to your results, what happens to reactivity as you go down a group/family?
4. According to your results, what happens to reactivity as you go across a period?

Part D: Solubility

Make solutions of each of the compounds (NOT elements) listed below. Put a pea size sample into 3-4 mL of distilled water. Be sure to label the test tubes.

1. magnesium nitrate
2. calcium nitrate
3. strontium nitrate
4. barium nitrate

Determine the solubility of each of the metal compound solutions you just made in the following solutions by adding 10 drops of the metal compound solution you just made to 10 drops of the following. Make sure to use clean test tubes every time. Don't cross-contaminate the droppers!

H_2SO_4 – Sulfuric acid Na_2CO_3 – sodium carbonate
K_2CrO_4 – Potassium Chromate $(NH_4)_2C_2O_4$ – ammonium oxalate

	$Mg(NO_3)_2$	$Ca(NO_3)_2$	$Sr(NO_3)_2$	$Ba(NO_3)_2$
H_2SO_4				
K_2CrO_4				
Na_2CO_3				
$(NH_4)_2C_2O_4$				

0 – not soluble; + - slightly soluble; ++ - soluble ** Complete all combinations.

Questions:

1. What is the name of the family that Mg, Ca, Sr, and Ba belong to?
2. According to your data, what happens to the solubility of the lements as you go down a family/group?

Part E: Electron Configuration

Write the electron configuration for each of the following elements.

1. lithium
2. sodium
3. potassium
4. beryllium
5. magnesium
6. calcium
7. hydrogen
8. helium
9. argon

Questions:

1. What happens to the number of electrons in the outer energy level of each atom as you go down a group/family?
2. What happens to the number of electrons in the outer energy level of each atom as you go across a period?
3. What is the relationship between the number of outer electrons and the number of the group/family?

Lane Earth/Space Grant

Science and math teachers at public, private, or tribal schools in South Dakota may now apply for the 4th annual **"Kelly Lane Earth and Space Science Grant"** provided by the NASA South Dakota Space Grant Consortium. This $5,000 grant is awarded annually to a select science or math teacher in South Dakota to recognize and support outstanding teachers and innovative educational programs at the pre-college level. **The application announcement for the 2010 grant is posted at the website below.** The submission deadline is ***4:00 p.m. on January 11, 2010***. The winner will be announced at the science and math teacher's joint conference in Huron on February 4-6, 2010!
http://sdspacegrant.sdsmt.edu/KellyLaneTeacherGrant.htm

We encourage your applications! Feel free to forward this announcement to any science or math teachers in South Dakota that you think may be interested. Thank you.
Sincerely,
Tom Durkin

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Website: http://sd.spacegrant.org

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Robotics

The NASA South Dakota Space Grant Consortium (SDSGC) is pleased to release the attached announcement calling for applications for robotics materials. We anticipate awarding two $5,000 awards. Eligibility to apply is limited to teachers/educators who either A) have taken robotics training through the NASA South Dakota Space Grant Consortium anytime during 2006 – 2009, or B) have sustained robotics programs/ curriculum in their classrooms or at their schools. Our robotics teacher-training workshops have been offered in Rapid City (The Journey Museum), Pierre (SD Discovery Center), and Sioux Falls (Augustana College). The lead instructor has been Angelo Casaburri of NASA's Aerospace Education Services Project.

The announcement is attached as a Microsoft Word document. It is also posted online in PDF format at http://sdspacegrant.sdsmt.edu/RoboticsMaterialsAwardAppFY2009.pdf

Please note that the application deadline is **January 11, 2010**. If you have any questions, please feel free to contact me.
Regards, Tom Durkin
Thomas.Durkin@sdsmt.edu

Physics Bowl XXXVI

The Physics Department of SDSU would like to invite your school to enter a team in Physics Bowl XXXVI (in conjunction with Engineering Expo). It is intended to be a fun, exciting and rewarding experience for your students. This contest, which starts with registration at 1 pm, is an opportunity to make physics teaching and learning fun. The student contestants experience the excitement of competition and meet other students from a variety of schools. Some of the contestants will carry away substantial cash prizes for themselves and a plaque for their school.

The following awards will be presented to each member of the top five teams: $40 to each member of 1st place, $30 to each member of 2nd place, $20 to each member of 3rd place, $15 to each member of 4th place and $10 to each member of 5th place. The top five schools will also receive an appropriate plaque. Each team sponsor will also receive a physics memento of some sort in appreciation of his/her efforts.

Each school is eligible to enter one team up to 3 students to compete against the other schools. Science teachers may decide in their own way how to select the team members for their school. If you are interested in participating, return the entry form and we will send you complete details at a later date.

Attn: Sally Krueger
Department of Physics
SDSU - Box 2219
Brookings, SD 57007
Phone 605-688-5428
F a x 605-688-5878
Sally.Krueger@sdstate.edu

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

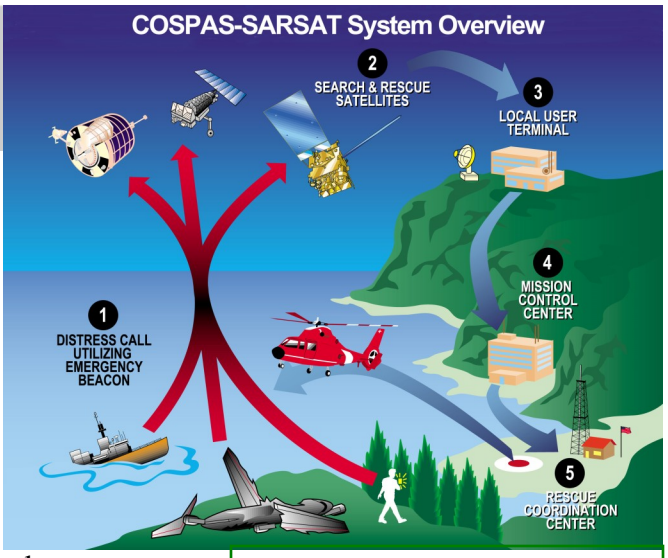
SARSAT to the Rescue

If a plane crashes in the woods and nobody hears it, does it make a sound? Never mind contemplating this scenario as a philosophical riddle. This can be a real life or death question. And the answer most of the time is that, even if no people are nearby, something is indeed listening high above.

That something is a network of satellites orbiting about 450 miles overhead. The "sound" they hear isn't the crash itself, but a distress signal from a radio beacon carried by many modern ships, aircraft, and even individual people venturing into remote wildernesses. In the last 25 years, more than 25,000 lives have been saved using the satellite response system called Search and Rescue Satellite-aided Tracking (SARSAT). So what are these life-saving superhero satellites? Why they are mild-mannered weather satellites.

"These satellites do double duty," says Mickey Fitzmaurice, a National Oceanic and Atmospheric Administration (NOAA) systems engineer for SARSAT. "Their primary purpose is to gather continuous weather data, of course. But while they're up there, they might as well be listening for distress signals too." In February, NASA launched the newest of these Polar-orbiting Operational Environmental Satellites (or POES) into orbit. This new satellite, called N-Prime at launch and now dubbed NOAA-19, prevents a gap in this satellite network as another, aging NOAA satellite reached the end of its operational life.

"The launch of N-Prime was a big deal for us," Fitzmaurice says. With N-Prime/NOAA-19 in place, there are now six satellites in this network. Amongst them, they pass over every place on Earth, on average, about once an hour. To pinpoint the location of an injured explorer, a sinking ship, or a downed plane, POES use the same Doppler effect that causes a car horn to sound higher-pitched when the car is moving toward you than it sounds after it passes by.



NOAA's polar-orbiting and geostationary satellites, along with Russia's Cospas spacecraft, are part of the sophisticated, international Search and Rescue Satellite-Aided Tracking System.

In a similar way, POES "hear" a higher frequency when they're moving toward the source of the distress signal, and a lower frequency when they've already passed overhead. It takes only three distress-signal bursts (each about 50 seconds apart) to determine the source's location. Complementing the POES are the Geostationary Operational Environmental Satellites (GOES), which, besides providing weather data, continuously monitor the Western Hemisphere for distress signals. Since their geostationary orbit leaves them motionless with respect to Earth below, there is no Doppler effect to pinpoint location. However, they do provide near instantaneous notification of distress signals.

In the future, the network will be expanded by putting receivers on new Global Positioning System (GPS) satellites, Fitzmaurice says. "We want to be able to locate you after just one burst." With GPS, GOES will also be able to provide the location of the transmitter.

Philosophers beware: SARSAT is making "silent crashes" a thing of the past. Download a two-page summary of NOAA-19 at www.osd.noaa.gov/POES/NOAA-NP_Fact_Sheet.pdf. The Space Place gives kids a chance to rescue stranded skiers using their emergency rescue beacons. The Wild Weather Adventure game awaits them at spaceplace.nasa.gov/en/kids/goes/wwa.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

The above image may be downloaded from

http://spaceplace.nasa.gov/news_images/sarsat.jpg

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SD-AAPT Photo Contest

For complete details & forms, see the website at http://sdaapt.sdsta.org Photo taken by student and a typewritten essay of 250 words or less.

Share the Classroom Treasurers

An area will be set up at the Conference for teachers to bring items from their personal collection that you no longer use or have duplicates of. Help the planet by recycling.

The **SDSTA** Newsletter is published four times a year. The December issue (this one) is mailed to 225 paid members & science organizations & a few others.

The Membership year in SDSTA starts with the February conference and ends the first of February. Dues are due at each conference for member discount rates.

SDSTA members may give a one year free membership to their student teachers by submitting the student teacher's name & address.

One **free conference registration** is given away to the SDSTA member that has made a submission to the newsletter (or given a presentation at the conference) and has referred at least three new members.

Members may also earn a 10% finders fee for any science related ads placed in the newsletter. Our rates are $75 per page (or 3 to 4 quarter pages) or insert per issue or $225 per page for four consecutive issues.

Einstein Fellowship - Application Now Open!

The Albert Einstein Distinguished Educator Fellowship is a paid fellowship for K-12 math, science, and technology teachers. Einstein Fellows spend a school year in Washington, DC serving in a federal agency or on Capitol Hill. To be considered for an Einstein Fellowship for the 2010-2011 school year, apply and submit three letters of recommendation online by January 13, 2010.

Apply online at http://www.einsteinfellows.org/application.html

For more information about the Einstein Fellows program visit www.einsteinfellows.net or contact Program Manager Kathryn Culbertson at culbertsonk@triangle-coalition.org.

Mail to: Brant Miller, SDSTA Treas
1030 27th Ave SE, Apt."F"
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OR: Mark Farrand, Membership
4009 Brookside Dr.
Rapid City, SD 57702

$ 5 student
$ 5 K - 6
$ 20 Others

Name _____ Home Phone ____-_____
Home Address _____ E-mail:
City _____ State _____ Zip _____

Your School _____ School Phone ____-_____
School Address _____
City _____ State _____ Zip _____
Your area K - 6 7 - 8 9 - 12 College Other_____
(circle one)
referred by_____

South Dakota Science Teachers' Association

James Stearns, Editor
S D S T A Newsletter

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Groton, SD 57445-2024

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Calendar of Events Calendar of Events

2009 is the 40th Anniversary of the Apollo program—http://www.nasa.gov

Dec. 3-5 NSTA Area Conference—Phoenix, AZ

Jan. 11, 2010 Application deadline for $5,000 "Kelly Lane" Earth & Space Science Teacher Grant
http://sdspacegrant.sdsmt.edu/KellyLaneTeacherGrant.htm

Jan 13 Deadline for application to Einstein Fellowship Program
http://www.einsteinfellows.org/application.html

Jan 16 Deadline for submissions to the SD-AAPT Photo Contest

Jan 28 Application deadline for Miami University's Project Dragonfly
http://www.MyMasters.org

February 4—6, 2010 18th Annual Joint Math & Science Conference - Huron, SD

March 18-21 NSTA National Conference in Philadelphia, PA - NSTA.org

April 23 Physics Bowl XXXVI - **Sally.Krueger@sdstate.edu**

June 18-July 3 2010 Toyota International Teacher Program to Costa Rica
http://www.toyota4education.com

October 27-29 NSTA Area Conference—Kansas, MO

Homepage Located At http://www.sdsta.org

Calendar of Events Calendar of Events Calendar of Events Calendar of Events

Science Notebooks

By Nicole Keegan

What do you do when something works? Make it even better! This is always the motto in teaching. We have a lesson that is fabulous, but we make those minor adjustments to make it that much better. I have found a resource that has changed the way I teach Science. My students have always used notebooks, but there were more of a place to keep notes or do formal lab write-ups and/or conclusions. They usually got lost, misplaced, or destroyed by the end of the year (they are middle schoolers!).

Over the summer, a group of Science teachers and myself read the book, *Science Notebooks- Writing about inquiry* by Campbell and Fulton. This is the perfect summer book for me because there are pictures, examples, and it is short! As we read, we found many pieces of labs that we already did, but ways to enhance them even more. For example, in the heading for the lab, add the name of the lab partner. There were also many pieces that we had never thought of, such as the use of technical, detailed drawings to represent their findings.

Yes, I know this may not be blowing your mind yet, it wasn't doing that for me either at this point. It was when I saw the students actually carry out the labs and do their technical drawings, carefully collecting both qualitative and quantitative data and writing page long conclusions that I realized this was it! The students are now more proud of their notebooks than before. We are almost half-way through the school year and I have no lost notebooks, they are all in good condition and my students use them EVERY day.

This topic will also be presented at the SDSTA Conference in February on Friday at 3:30 and Saturday at 1:00.

Global Climate Conference in Copenhagen, Denmark

Have you heard about the UN Climate Change Conference that took place December 7-18 in Copenhagen Denmark? President Obama showed up on the last day just in time to sign a "meaningful agreement" on climate change. It may be a first step, but hardly enough to combat the threat of our warming planet.

Several people from South Dakota attended the conference. One of those was Augie college student Jamie Horter. She was able to attend the conference because of a partnership with the Will Steger Foundation, a nonprofit organization committed to creating local & global environmental solutions. While in Denmark, Jamie wrote blogs & emails and took many pictures & videos.

The Will Steger Foundation offers many free K-12 Educational materials, that can be found at http://www.willstegerfoundation.org/index.php/programs/k-12-education-progra . If you wish to find more information directly from Jamie, you can contact her at JamieH@willstegerfoundation.org or jamiehorter.blogspot.com

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Joint Math & Science Conference

Just a reminder or two about the February 4-5-6, 2010 conference in Huron.

- Share the Classroom Treasures will be located in the Board Room-Do you have something that you no longer use & would like for someone else to get some use out of?
- Thursday night starts with Math & Science sharing sessions. Bring 25 copies of your favorite activity or lesson. Or just come!
- Noon luncheons are included in your conference registration fee.
- Science sessions will feature presentations about NASA, Field Biology, published authors to help with incorporating nature of science into the curriculum, interactive white board/Promethean, Inquiry activities, field trips, Periodic Table, climate change, weather watchers and much more.

For the SD-AAPT Photo Contest, check details at http://sdsta.k12.sd.us/sdaapt/contest.htm