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ISTS Newsletter

Iowa Academy of Science

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2-15-2008

## ISTS E-Newsletter, February 15, 2008

Iowa Academy of Science

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## Iowa Science Teachers Section Iowa Academy of Science

February 15, 2008

Nadine Weirather, Editor

### Contents of the ISTS E-Newsletter:

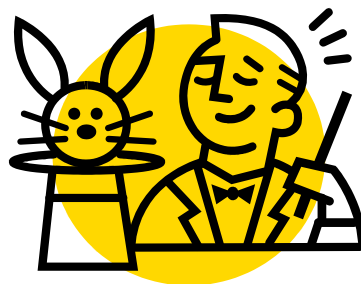
- **Messages from:**
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### A Message From Your ISTS Chair, Traci Maxted:

#### WATCH ME PULL A RABBIT OUT OF MY HAT!

Year in and year out science teachers inspire, guide and encourage. It seems like the well never runs dry from that endless supply of energy and eagerness.

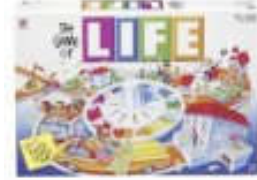
Where does that inspiration come



from? It comes from networking and working with other science teachers. Meeting new people and new experiences give you opportunities for new ideas and a chance to recharge. The inspiration comes from the chance to feel good by helping a new teacher or learning a new approach.

Let's be honest, teaching is more "happiness points" than "money points" in the game of Life. Get those happiness points!

**BE INVOLVED!**



## **Science: Our Past and Future**

Scientific exploration of the past has played a major role in defining our present lives. It will continue to define how we understand our universe.

The 2008 ISTS fall conference will honor the ongoing tradition of discovery, from the days of the HMS Beagle to travel in space.

Join us at the Polk County Convention Complex in Des Moines on October 23, 2008



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**HAPPY 200<sup>TH</sup> BIRTHDAY  
CHARLES DARWIN!  
February 12, 1809**



Be more informed:

<http://www.darwinfoundation.org/>  
<http://www.aboutdarwin.com/voyage/voyage01.html>

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You are invited to a birthday celebration  
for

*Charles Darwin*

2008 will be the 200<sup>th</sup> year of his birth.

This renowned author and scientist will be our  
guest speaker at the ISTS 2008 Fall Conference.  
(Well, maybe a close likeness, instead)

The October 2008 fall conference theme will be  
**Science: Our Past and Our Future**  
We hope to see you there!

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### **Help Wanted:**

There are some open positions in ISTS as Regional Director for Region 1: Keystone AEA or Region 10: Grant Wood AEA. There are always openings for committee members on the conference committee. Everyone is encouraged to send presentations for the conference. We will be asking for presenters very soon!

Interested in a bit more? Nominate yourself for Chair or Secretary of ISTS. We will be voting on those positions this spring.

## **Memo from the Past ISTS Chair, Gale Vermeulen:**

### **Please Get Involved**

I encourage you to become more involved in the Iowa Science Teachers Section of the Iowa Academy of Science. As I tell my students, there are two kinds of people, those who are problem solvers and those who complain about the problem. I know many of you are problem solvers, and we need your help. Please contact me ([vermeuleng@oskaloosa.k12.ia.us](mailto:vermeuleng@oskaloosa.k12.ia.us)) if you are willing to serve ISTS in any capacity. We need everyone who is willing to help out. As the old adage says, "Many hands make light work."

I view those who are on the ISTS leadership team as servant/leaders. We feel that it is our duty to help promote science education and help science teachers in the state of Iowa. We feel that we have benefited so much from others who have shared their expertise with us, and we want to reciprocate. Please join us.

I also encourage you to start thinking NOW about what presentation proposal you can submit for the 2008 Fall ISTS conference. By thinking about it now, it's easier to make the deadline. This also is a kindness to the conference chair. Otherwise she may panic in fear that there won't be enough presentation proposals to choose from.

## **Message from your Vice Chair, Morgan Masters:**

| Morgan Masters, Vice Chair ISTS

Having the opportunity to teach science is a wonderful thing. If you are like me, you are always looking for more effective ways of getting the job done in the classroom. Being a member of the Iowa Science Teachers Section of the Academy gives you a big advantage; you have access to so many talented science educators across the state of Iowa. As a member we encourage you to share your talents, successes and ideas with others. We encourage you to get more involved, your talents and expertise in science education is needed. For example, run for a leadership position, help work at the Fall Conference, write an article for our newsletter sharing your successes, volunteer to present at the Fall Conference or encourage a colleague to join and attend the conference with you next year. I guess this is a lot like your classroom where you try to encourage your students to get more involved and become part of the big picture. I personally invite you to become more active in our organization. You will work with some of the very best and most effective science educators in Iowa.

## Observations of a Well-Seasoned Middle School Science Teacher

### **“Helpful Reminders for Keeping Science Alive the Classroom”**

The “the cold weather blues” is always a threat in a snowy winter such as this year in Iowa. While sitting at the computer on one of our most recent snow days I was contemplating ways in which I might keep my classroom more alive and interesting. So, after rummaging through my old folders and notes I put together a list of items that might help both me and my students become more successful in the classroom. Many of you already do these things and more. I, however, just need to make a list to remember them. (I might remind you, I am older than almost all of you. Give me some slack!)

- 1) Greet your students every day at the door. Making connections, getting to know your individual students makes a world of difference. Check out their faces and responses.
- 2) Are you having a great and exciting time in your classroom? If not maybe something needs to be changed. Be positive, enthusiastic and excited about what you teach. Is your class enjoyable? Would you want to be a student in your class?
- 3) “Interest is the Key to Education”. This is actually something I remember from Education course 101. Students learn more when they are interested in the subject. Tie in the real world, bring in items to stimulate their curiosity, do demonstrations, or better yet allow students to do demonstrations for their classmates.
- 4) Allow students to experience success. All students can do something for which they can be praised.
- 5) Questions are so important! Be conscious of asking good questions and don't forget that “wait time”. Don't be afraid to ask open-ended questions, you don't have to know all of the answers, seek out the answers together.
- 6) Break up into cooperative groups from time to time.
- 7) Start class with a short 2-3 minute video and then ask students to share their thoughts or give them a one minute period of time to write about the topic in their notebook.
- 8) Use community resources. Invite guest speakers into your room, people who are in the know on topics related to the concepts you are teaching.
- 9) Use a wide variety of teaching methods. (Small groups, letter writing, debates, posters, research projects, model building of a concept, Power Point production, write a song, a story, a poem or a bumper sticker about the concepts you are studying, put together a skit, or puppet show...) (Next newsletter I will publish a list of more than 50 different teaching strategies in a little more detail).
- 10) Use a different reading strategy in your science class. Try to use a different strategy at least two times a month.

- 11) Give a short 10 question pre and post test about major misconceptions in the area of science you teach.
- 12) Get students up and out of their chairs. Ask students to demonstrate or model some of the concepts they are studying.
- 13) Co-teach with another teacher. The other teacher can be in science or even in another discipline. Show students how major concepts are actually overlapping into other disciplines.
- 14) Don't sit behind your desk. Interact with students, move around and get involved with what is going on.
- 15) Don't keep student grades a secret. Keep students informed about where they are and what they might be able to do to be more successful.
- 16) Use pictures, sounds and other media to help students better understand concepts. Writing on the board is not enough.
- 17) Get students out of the classroom periodically. Sometimes sitting in the bleachers and talking about a major concept can be very effective.
- 18) Change the organization of the room. Rather than sitting and working in rows, rearrange the tables or chairs into a circle or larger blocks. Change can be good!
- 19) Incorporate technology into your lesson plans. Today's students are very technology orientated and they can certainly multitask much better than many of us in this area. Take advantage of the iPod, cell phone and computer literate students we have today.
- 20) Think about changing the role of the teacher and student. Allow the student to do the work instead of standing up front while they rest on their elbows. Put students in charge of their own learning. Most often they are willing and very good at using these opportunities.

This is just a short list of some possible things to think about in making your classroom a more effective place to learn science. I tack lists such as this up behind my desk so I can regularly put the ideas into practice.

Morgan Masters, Northview Middle School, Ankeny, Iowa (vice-chair ISTS)

## Announcements

### • ISTS Elections in March/April

Ballots for the 2007 ISTS elections will be included in the spring edition of the Iowa Academy of Science Bulletin along with the ballots for IAS President and Board Members. All current members of the Iowa Science Teachers Section will be eligible to vote for ISTS President-Elect, ISTS Secretary and all IAS positions. Ballots may be returned by mail or filed electronically.

Nominations for all open positions are still being accepted. If you would like to run or nominate a fellow ISTS member for ISTS President Elect or Secretary, please contact Morgan Masters at [scihawk@aol.com](mailto:scihawk@aol.com). If you would like to run or nominate a fellow Academy member for the Iowa Academy of Science Board of Directors, please contact Erica Larson at [elarson@aea10.k12.ia.us](mailto:elarson@aea10.k12.ia.us). It is through the actions of our dedicated volunteers that the work of the Academy is accomplished.

- **New Chemistry Lessons Teach about Fire**

*The Chemistry of Fire program is being sent to high school science department chairs nationwide*

The Society of Fire Protection Engineers (SFPE) has partnered with Discovery Education to create a new in-school program titled *The Chemistry of Fire*. The program is funded by a grant from the U.S. Department of Homeland Security. *The Chemistry of Fire* is geared to high school chemistry students. It will teach students the science behind fire as a way for students to fully understand the dangers of fire. As a result, it will increase the awareness of fire and the importance of home fire prevention.

The interactive program includes a teacher's guide with five lesson plans, a DVD that demonstrates exciting experiments included in the lessons, three classroom posters and a web site where teachers and students can find more classroom and career resources. The program is aligned to the National Science Teachers Association Standards for 9th - 12th grades.

Currently, there is a nationwide shortage of fire protection engineers. Their skills are necessary to protect people and property from the threat of fire. These lessons will help students explore career opportunities in the field of fire protection engineering. The program was to be released to nearly 20,000 high school science department chairs nationwide in mid- January 2008. For more information go to: [www.sfpe.org](http://www.sfpe.org)

## **Opportunities**

- **Participate in National Environmental Week 2008**

Sign up now to take part in National Environmental (EE) Week, April 13-19, 2008!



Now in its fourth consecutive year, [National EE Week](http://www.eeweek.org/), at <http://www.eeweek.org/>, made possible by Canon, promotes understanding and protection of the natural world by actively engaging kindergarten through 12th grade students and educators in an inspired week of environmental learning before Earth Day (April 22). As partners in EE Week, educators have access to

- Standards-based environmental education lessons and activities;
- Monthly electronic newsletters that highlight the latest EE curricula, programs, and funding opportunities; and
- Opportunities for online communication and knowledge-sharing with educators from across the country.

You can join National EE Week's efforts, promote environmental learning, and gain national exposure for your work by [registering today](http://www.eeweek.org/register.htm) at <http://www.eeweek.org/register.htm>.

### • [2008 Weducation Weather Contest](#)

The free 6<sup>th</sup> annual National Weather Forecasting and Earth Science competition sponsored by Weducation, Inc. begins on **March 10, 2008**. Any **current, first time** (or equivalent) student enrolled in grades 7 – 12 is eligible. **Bonus points for early registration by February 29<sup>th</sup>**.

Teams must consist of 5 members from the same school but not necessarily from the same class. Only one team per school is allowed. More than one school per district however, may field a team. For contest rules and additional information e-mail [weducate@dreamscape.com](mailto:weducate@dreamscape.com) or call (315) 724-6364.

**REWARD:** Any team has a chance to win hundreds of dollars in cash and prizes. In addition, each member of the **winning team** will receive a prize and a certificate of achievement. Similar to the Stanley Cup, their individual names and that of their school will also be inscribed on our commemorative trophy.

### • [Online Physics Course for Teachers](#)

The Department of Physics and Astronomy at the University of Kentucky offers Newton's Universe.

Created specifically for grade 4-9 teachers, these guided inquiry courses are open nationwide to teachers at all grade levels. Each course earns either 1 graduate credit or 30 hours professional development credit. The courses use only middle school mathematics, and do not require any previous physics

courses.

### **Learn physics at your own site, on your own schedule!**

The courses emphasize understanding physics concepts, hands on learning, and inquiry-based activities. The courses will improve teachers' content knowledge, improve teaching practices, and promote learning and student achievement. Course content supports the National Science Education Standards.

These content rich, self paced and practical courses include:

1. Light
2. Temperature and Heat
3. Electricity and Magnetism
4. Force, Motion, and Energy

Course Equipment Kits are provided.

For further information, please visit us at [www.pa.uky.edu/sciworks/intro.htm](http://www.pa.uky.edu/sciworks/intro.htm).

### **[AAS Project 2061 Professional Development Opportunity](#)**

Do you want to learn more about AAAS's new *Atlas of Science Literacy, Volume 2* and how to put it to use to improve curriculum, instruction, and assessment in your science program? AAAS Project 2061 is offering two sessions of its popular professional development workshop "Using *Atlas of Science Literacy*" in Washington, DC, in 2008: March 11-13 and October 15-17. Now is the time to register for low earlybird rates.

Designed for K-12 science teachers, curriculum specialists, and other educators, the workshop demonstrates how participants can use the conceptual strand maps in *Atlas 1* and *Atlas 2*, along with other Project 2061 resources, to enhance their own understanding of science literacy and take a benchmarks-based approach to helping all students achieve literacy in science, mathematics, and technology. *Atlas of Science Literacy* is co-published by AAAS and NSTA.

For more details and a registration form, please visit our [workshop information page](http://www.project2061.org/events/workshops/default.htm), at <http://www.project2061.org/events/workshops/default.htm>. Additional workshops will be scheduled throughout the year and around the country. Check this page often or sign up (<http://www.project2061.org/about/feedback.asp>) for the free e-newsletter and receive automatic updates on workshops and other news about Project 2061.

- **UNI RAISE Professional Development**

Research Avenues for Iowa Science Educators (RAISE) at the University of Northern Iowa is accepting applications for this summer. Teachers earn \$3,300 plus \$300 for school supplies (and can opt for 3 graduate credits in content or science education for a mere \$150) by conducting research shoulder-to-shoulder with a UNI scientist over a flexible six-week period. Visit our website for more info: [www.uni.edu/raise](http://www.uni.edu/raise) or contact Jeff Weld, RAISE director, 319-273-2723 or [jeff.weld@uni.edu](mailto:jeff.weld@uni.edu)

- **Wired Science and PBS**

**Help Your Students Show off their Science Savvy With WIRED SCIENCE and PBS!** [www.pbs.org/kcet/wiredscience/education/](http://www.pbs.org/kcet/wiredscience/education/)

PBS and its newest series, WIRED SCIENCE, are hosting an **online student video contest** with a first prize of **\$2,000!**

Help your students make a short video exploring a cool scientific principle and they could be featured on the WIRED SCIENCE Web site! The video topic can be anything - a math formula, a chemistry equation, a law of physics - as long as it's science-related. In the spirit of the show, judges are looking for creativity. Be original. Make us laugh. Excite us. And, of course, remember to be safe. The top 20 finalist videos will be posted to pbs.org and in the Apple Student Gallery.

**The registration deadline is March 15, 2008 and completed entries are due April 1, 2008.** Winners will be announced May 17, 2008.

For more information and instructions on how to enter, visit [www.pbs.org/kcet/wiredscience/education/student-video-contest](http://www.pbs.org/kcet/wiredscience/education/student-video-contest).

And be sure to check out the other great online features at WIRED SCIENCE! Check local PBS listings for air times of WIRED SCIENCE. WIRED SCIENCE is presented by KCET Los Angeles. For more information on the thousands of free resources PBS provides to educators every day, visit **PBS Teachers** at [www.pbsteachers.org](http://www.pbsteachers.org).

## • [Facing the Future Releases K-4 Curriculum on Global Sustainability](#)

*Facing the Future*\* is pleased to announce the release of **Teaching Global Sustainability in the Primary Grades: A K-4 Curriculum Guide**, a standards-aligned resource that addresses core concepts related to sustainability while encouraging critical thinking and a systems perspective among young students. The curriculum guide includes four lessons that explore topics including identity and culture, food, biodiversity, and systems. This curriculum features hands-on activities, teacher background reading, vocabulary, service learning projects, and assessment rubrics.

*"I am delighted by these lessons. I found:  
**Complete** lessons (from A to Z, from "An Overview" to "Reproducible Handouts")  
**Creative, imaginative** learning activities that !get" primary-grade children  
Key **issues/concepts** are identified along with inquiry questions for each lesson  
**Challenging** content. I don't know that I've seen a better introduction to problem solving for primary children"*

*~ Dr. Walter Parker, Professor of Education,  
University of Washington*

All lessons included in this book have been reviewed and field tested by content experts, teachers, and students. To learn more about this brand new curriculum and to **download a lesson for FREE** copy/paste this URL:

<http://www.facingthefuture.org/Home/CurriculumDetails/tabid/131/Default.aspx?ItemID=TGSPG> . For questions or comments, contact Kim Rakow Bernier at [kim@facingthefuture.org](mailto:kim@facingthefuture.org) or (206) 264-1503.

## • [Summer Teaching Institute](#)

**Carleton College in Minnesota** will offer its twenty-ninth annual Summer Teaching Institute, June 23-26, 2008. Nineteen workshops will be offered including **Biology, Chemistry** and **Physics**. All classes are designed to introduce teachers to new materials as well as to allow them to develop materials for a variety of teaching situations, including AP courses. Each workshop carries the option of three graduate credits, which is equivalent to two semester credits. Our residence halls all provide central air-conditioned rooms.

**Tuition:** \$675

**Room and Board:** \$285 for a double, \$350 for a single (limited availability)

*For more information:*

Jeremy Updike  
Carleton College  
One North College Street  
Northfield, MN 55057  
Phone: 507-222-4038 Fax: 507-646-4540  
E-mail: [summer@carleton.edu](mailto:summer@carleton.edu) Web: <http://apps.carleton.edu/campus/SAP/teaching/>

## • **Another Summer Teaching Institute**

**Summer Institute in Physics and Physical Science for Inservice Teachers  
June 23-July 31, 2008 (tentative)  
Department of Physics, University of Washington, Seattle**

The Center for Physics Education in the University of Washington Physics Department offers a six-week, 10-credit summer institute in physics and physical science for full-time inservice teachers. The 2008 institute is tentatively scheduled for June 23-July 31 at the UW in Seattle. Classes meet from 9 a.m. to 3:30 p.m. Monday-Thursday. Directed by Professor Lillian C. McDermott and supported by the National Science Foundation, the institute is tuition-free and a \$1500 stipend is offered on successful completion of the course work. Additional money is available if needed to help defray the cost of lodging for persons from outside the Seattle area.

The *Physics by Inquiry* curriculum used in the course has been especially designed to strengthen the subject matter background of teachers in topics typically covered in precollege physics and physical science using a hands-on, inquiry-oriented method of instruction. The materials emphasize the development of fundamental concepts and reasoning skills through laboratory experience. The class is divided into two sections: one for elementary-middle school teachers with little or no background in physics; the other for high school teachers of physics, physical science, and mathematics.

The application deadline is February 29, 2008. Additional information is available on our website <<http://www.phys.washington.edu/groups/peg/si2008.html>>.

For further information contact:

Nina Tosti  
University of Washington  
Department of Physics, Box 351560  
Seattle, WA 98195-1560  
phone: 206.685.2046 [peg@phys.washington.edu](mailto:peg@phys.washington.edu)

## News

- **STEM Careers Highlighted from the Sloan Career Cornerstone Center**

Middle and high school science teachers, students, and school counselors will appreciate this career site just for STEM careers with profiles and audio podcasts that clearly explain options, salaries, career paths, etc for dozens of STEM fields. Check it out!!!

<http://www.careercornerstone.org/forteach.htm>

- **News from The Space Place at NASA**

### **1. Challenge Yourself with Weather Slyders**

The Dust Bowl. Hot, loopy solar gases. Killer Katrina. Combining dramatic images of Earth and space weather with the challenge of an old-fashioned slider puzzle, the new "Slider" game on the SciJinks Weather Laboratory website will capture the attention of any middle-schooler--and maybe even their parents and teachers. Players pick from a rich variety of captioned images, including photos from the ground, photos from space, and artist's renderings. After picking a difficulty level (3x3, 4x4, 5x5 grids), the player slides the scrambled tiles around to make a whole picture again. Go to <http://scijinks.gov/weather/fun/slyder> to become the newest Slider buff!

### **2. "Is Time Travel Possible?"**

Every science fiction fan has pondered the weird implications of time travel. Can you travel into the future and find out the winning Super Lotto number# -then come back and buy a ticket? Would doing so be cheating the laws of physics (to say nothing of ethics)? Astrophysicist Marc Rayman toys with such ideas in this Space Place Musings Podcast. Go to <http://spaceplace.jpl.nasa.gov/en/educators/podcast/> to subscribe to these Podcasts. Or listen now to this and the previous Podcasts on your computer or read the transcripts.

### **3. No Mars Rock Unturned**

by Patrick L. Barry

Imagine someday taking a driving tour of the surface of Mars. You trail-blaze across a dusty valley floor, looking in amazement at the rocky, orange-brown hillsides and mountains all around. With each passing meter, you spy bizarre-looking rocks that no human has ever seen, and may never see again. Are they

meteorites or bits of Martian crust? They beg to be photographed.

But on this tour, you can't whip out your camera and take on-the-spot close-ups of an especially interesting-looking rock. You have to wait for orders from headquarters back on Earth, and those orders won't arrive until tomorrow. By then, you probably will have passed the rock by. How frustrating!

That's essentially the predicament of the Spirit and Opportunity rovers, which are currently in their fourth year of exploring Mars. Mission scientists must wait overnight for the day's data to download from the rovers, and the rovers can't take high-res pictures of interesting rocks without explicit instructions to do so.

However, artificial intelligence software developed at JPL could soon turn the rovers into more-autonomous shutterbugs.

This software, called Autonomous Exploration for Gathering Increased Science (AEGIS), would search for interesting or unusual rocks using the rovers' low-resolution, black-and-white navigational cameras. Then, without waiting for instructions from Earth, AEGIS could direct the rovers' high-resolution cameras, spectrometers, and thermal imagers to gather data about the rocks of interest.

"Using AEGIS, the rovers could get science data that they would otherwise miss," says Rebecca Castaño, leader of the AEGIS project at JPL. The software builds on artificial intelligence technologies pioneered by NASA's Earth Observing-1 satellite (EO-1), one of a series of technology-testbed satellites developed by NASA's New Millennium Program.

AEGIS identifies a rock as being interesting in one of two ways. Mission scientists can program AEGIS to look for rocks with certain traits, such as smoothness or roughness, bright or dark surfaces, or shapes that are rounded or flat.

In addition, AEGIS can single out rocks simply because they look unusual, which often means the rocks could tell scientists something new about Mars's present and past.

The software has been thoroughly tested, Castaño says, and now it must be integrated and tested with other flight software, then uploaded to the rovers on Mars. Once installed, she hopes, Spirit and Opportunity will leave no good Mars rock unturned.

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

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## *Your ISTS Leadership:*

### **Iowa Academy of Science Mission:**

- Promote scientific research and its dissemination
- Improve instruction in the sciences
- Promote public understanding of science
- Recognize excellence in science and science teaching.

Check out past issues of the ISTS newsletter at  
<http://ists.pls.uni.edu/newsletters/index.html>.

Your ISTS Leadership Team can be found at:  
<http://ists.pls.uni.edu/officers.html>.

(We are always looking for good people. Send an e-mail to [tmaxed@cr.k12.ia.us](mailto:tmaxed@cr.k12.ia.us) if you wish to be more involved.)

### **Invitation to improve/contribute to this newsletter**

How best can this newsletter serve you? Do you have something to contribute for the good of the ISTS membership? Zing a line at [nweirather@central-lee.k12.ia.us](mailto:nweirather@central-lee.k12.ia.us) or [tmaxed@crk12.ia.us](mailto:tmaxed@crk12.ia.us).