From the President

Betsey Clifford

It seems impossible that spring is around the corner and months have passed since our fall conference. Time seems to be flying and I imagine many of you can relate. MAST has been busy preparing for our fall event and making plans to support NSTA Boston in 2014. Some of us will be traveling to San Antonio in April for the NSTA 2013 conference as well. This issue of the MASTHEAD has great articles, reflections, updates from the affiliates, exciting upcoming events, and some reminders of vacant positions on our Board of Directors.

Please consider joining our board or volunteering for one of the committees! Getting involved with the board at different levels and now as your president has offered me great leadership experiences. I have learned so much about science education in Massachusetts and beyond. The amount of resources is amazing and truly exciting. These leadership experiences have motivated me to pursue my PhD in Curriculum and Instruction. In this first year of the program I have taken a variety of curriculum and administrative courses. I am learning so much about how complex education and specifically science education really is. The support and recognition of science education has progressed from very humble beginnings. I feel honored and proud to be part of this society in Massachusetts. I ask you to celebrate with me the success Massachusetts experienced with ranking at the top internationally with Singapore for 8th grade science testing.

It is hard to step out of our classroom or curriculum guides to look at the big picture, yet so crucial. We need to celebrate, share ideas and resources, and network to strengthen what we do each day. Everyone has so much to offer and I am humbled each year as I meet presenters, exhibitors, and participants at conferences or workshops throughout our state. Please consider sharing your ideas and resources, regardless of how experienced of an educator you are. Share through the MASTHEAD, our website, offer a workshop, or just with your colleagues. Wishing all health and rejuvenation as we enter the spring season!
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The MASTHEAD is published by the Massachusetts Association of Science Teachers. Members receive four issues per year in September, December, March, and June. The MASTHEAD is published for those interested in the advancement of science education. This publication provides information about science activities, and opportunities around the state and the nation, as well as sources for materials for science teachers. It also serves as a forum for ideas and classroom strategies.

The staff of the MASTHEAD and the Board of Directors of MAST assume no responsibility in the case of injury or loss by persons using any information material in this publication.

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www.MassScienceTeach.org
On March 19, 2013, the day prior to the 7:02 A.M. (EDT) arrival of the Vernal Equinox, NASA’s Sun-Earth Day will celebrate with **Solar Max: Storm Warning** events across the country.

Typically, when you hear the phrase “storm warning” it invokes unpleasant weather memories that are forever linked to your regional upbringing. Nor’easters with white-out conditions and slippery roads, devastating storm surges and hurricane force winds, or storm cellars and the short notice of an approaching tornado, nothing you’d actually look forward to under the pale blue skies of a March spring day. This storm warning will be a celebration of the researchers and NASA missions dedicated to the study of our star as it approaches the active period of its irregular eleven-year cycle.

Teachers interested in registering for resources and alerts from the Sun-Earth Day team will find information at the following web address: [http://sunearthday.nasa.gov/2013/](http://sunearthday.nasa.gov/2013/)

Schools museums, planetaria, parks and community organizations are all encouraged to sponsor events as they relate to the Vernal Equinox and the heightened awareness of activity on our star. AstronomyClubs.com posts the contact information for organizations around the world supporting amateur astronomers’ efforts to promote citizen science and observations of the heavens. The link for the clubs in Massachusetts may be found at: [http://www.astronomyclubs.com/state/Massachusetts](http://www.astronomyclubs.com/state/Massachusetts) Often members of these organizations have access to special solar viewing telescopes and filters that permit the viewer to safely look at the sun, a very dangerous thing to do with regular optics and no filtering.

These daytime “star parties” are an excellent opportunity for a variety of solar themed science activities that are located on the Sun-Earth Day web site under the educator links for “Past Sun-Earth Days”. A favorite activity with many measurable outcomes is the UV Bead activity. Exploring Ultraviolet (UV) Light from the Sun is found at: [http://venustransit.nasa.gov/2008eclipse/materials/Exploring_Ultraviolet.pdf](http://venustransit.nasa.gov/2008eclipse/materials/Exploring_Ultraviolet.pdf) These beads are sensitive to UV Light and change color in the presence of ultraviolet light. Having used these beads for several years, it appears that some beads are more responsive to different frequencies of UV light, which opens the door to discussions on the electromagnetic spectrum, skin health and the effectiveness of UV filtering and sunscreen technologies. The beads are available through a number of commercial providers online and in many local science themed businesses. If you are planning to buy in bulk, shop around.
An online tool that I find particularly amazing is the Space Weather Media Viewer. This web site is located at http://sunearthday.nasa.gov/spaceweather/ and may be accessed directly through the Sun-Earth Day home page shared earlier. The page opens with a view of the sun from data retrieved by the Solar Dynamics Observatory (SDO) Atmospheric Imaging Assembly (AIA) in 19.3 nanometer wavelengths. This sounds pretty over the top, but basically this is an image of the sun’s turbulent corona. Not just any image, though this data is current and at the bottom of each image is the wavelength, date and universal time it was received. Each of the SDO instrument posts similar images in different frequencies for the same dates, often a short time apart. This tool permits your students to look through the outermost layers of the sun to track changes and identify possible relationships between different types of solar activity.

My personal favorite is to follow developing sunspots, so I use the images from the Helioseismic and Magnetic Imager (HMI). Comparing the Magnetogram and Intensitygram images your students can identify and track the polarities of the sunspots and, when compared from day to day, their path across the equatorial regions of the sun. If you match this information with the “Daily Sun” information on http://spaceweather.com/, your students can refer to the sunspots by their assigned scientific numbers. These numbers open gateways to scientific articles published online that discuss the developing sunspots and their potential for developing significant flares. The same conversations your students may also engage in over time. Using centimeter graph paper or a centimeter grid printed on a transparency serve as easily manageable ways for even young students to track these magnetic solar storms.

Beyond this striking imagery, the pull down menu on the Space Weather Media Viewer also offers readings on solar winds taken by the NOAA / NWS Space Weather Prediction Center and Auroral Activity on the Earth. NOAA is the federal agency that is responsible for the actual predictions of space weather on the Earth and more detailed data, alerts and forecasts are available on their web site at: http://www.swpc.noaa.gov/

With the Space Weather Action Center, available through the Sun-Earth Day home page, your students can report out on the sun’s weather using flip charts and data collection sheets that guide them through the process required to develop a “weather report”. Beyond the obvious and comical reports like, “It’s sunny on the sun today,” your students will begin to recognize solar activities that could affect spacecraft, communications, electronics and travel here on Earth.

The Massachusetts’ “Skills of Inquiry, Experimentation, and Design” document includes skills for record keeping, recording observations, asking questions and making predictions, recognizing patterns are prevalent across the grade levels. On the surface the learning standards for grades 6-8 are an excellent match and with a little creativity these activities may complement a host of communication and mathematics skills.

Keep up to date with NASA and its missions to explore our home planet and our celestial neighborhood by visiting www.nasa.gov.
STEM in Elementary Schools
Sharon LaRosa, STEM Coordinator for Elementary, Swampscott Public Schools

To all elementary teachers: I was in your shoes.

One of my first full time teaching jobs was teaching science in which I was hired by default - it was the only opening in a school where I had been a successful long-term substitute. My experience with science classes was from my own education, mostly reading a chapter and answering the questions at the end.; no experiments, no projects, nothing hands-on. When I got to the 8th grade we may have had a science fair, but nothing so spectacular that I even remember it. In seventh grade, my father shot a squirrel while hunting and I brought it to school where my teacher was very receptive to studying it. I am thinking that if this happened today, I might be suspended! Thank you to Mr. King for recognizing the excitement that squirrel brought to the class that day and allowing all of us to learn from it!

Luckily during that first science job, I had a wonderful co-teacher who worked with me in the content and the classroom experience I brought with me from previous teaching assignments was useful and relevant to being successful. What was of the greatest benefit, however, was professional development and attendance at conferences where hands-on workshops gave me the knowledge and skills to better teach science to my students. I am now in my 15th year of being involved in science education and have become a STEM Specialist. I regret the years I did not realize my love for science but am grateful for the years it became a reality.

It is no secret that elementary teachers prefer the humanities to the sciences, but with new standards just around the corner, science integration is going to be part of the norm. Connecting science to literacy is one of the ways elementary teachers can become comfortable with the science content areas and give them the time they need to incorporate it as part of the daily routine. One of the things teachers need most is time. Planning can easily be incorporated into routine practice if you think of it in terms of “integrating.”

Meeting all the demands of the elementary curriculum is challenging and literacy is a key focus area in which we are made accountable for our students’ learning. Placing an emphasis on literacy can be compatible with developing children’s scientific skills and understanding. Science can foster literacy due to the high interest students have in the subject. What better motivator do we have? Students' interests, desires, and abilities are forming during their earliest years. Science can provide the vehicle for promoting literacy through non-fiction reading, writing, and speaking if given the opportunity. Reading, writing, sequencing, comprehension, inferring, predicting, questioning, discussion, visualizing, cause and effect, summarizing -- aren't these all strategies we use in our literacy blocks? These strategies are already built into a science lesson!

So elementary teachers, gear up for the next science conference, develop your knowledge and skills, and make the transition of that knowledge onto your students easier. Help them to use that knowledge to develop their own solutions to problems and to create and invent something that has not been accomplished yet, even if it is from their imagination. Allow them to write about it, draw it, and discuss it. The passion you develop within them while learning science will become evident in your classroom.

Sharon received the Elaine Adams Professional Development Grant in 2012. She also presented at the 2012 MAST/MSELA Annual Conference, NSTA STEM Forum & Expo, and M.T.A. Conference. She is a member of NSTA, MAST, and MSELA.
Has Testing Reached A Tipping Point?
By Sam Chaltain

It wasn’t that long ago that suggesting America’s schools had become test-obsessed was a lonely endeavor. Although organizations like FairTest and campaigns like Time Out From Testing have been decrying the flawed logic behind high-stakes tests for years, the reality is that for the past decade, many of us kept our complaints reserved for the privacy of the parking lot.

People vented. Policymakers nodded. And absent any real noise, the tests continued.

In 2008, however, the election of Barack Obama seemed to augur a new era. All along the campaign trail, the Illinois senator suggested a clear understanding of the ways a single measure of success can distort an entire system and narrow the learning opportunities for children. Then he made history by becoming the nation’s 44th president — and unveiling a series of education policies that further entrenched America’s reliance on reading and math scores as a proxy for whole-school evaluation.

Again, the people vented. But this time, policymakers have been unable to ignore a groundswell of noise and resistance, leading many to wonder: Has a tipping point been reached? Are we witnessing the early signs of a sea change in how we think about the best ways to measure student learning and growth?

Consider three separate data points as evidence: Maryland, where the superintendent of the state’s largest district of schools has called for a three-year moratorium on standardized tests; Washington, where one school’s decision to boycott its state tests has spread to other schools and communities; and Texas, where a proposed Senate bill would significantly reduce the number of state standardized tests students must pass to graduate.

In all three places — and many more across the country — what’s changed is a growing willingness to publicly acknowledge what FairTest has argued for years: that tests do not align well with the latest research into how people learn; that they prevent adults from measuring higher-level thinking in children; and, most importantly, that there are better ways to evaluate student learning and growth.

The breadth of these mini-rebellions — from the Pacific Northwest to the Lone Star State — suggests that the unwillingness of the Obama administration to plot a new course for the country has awakened a latent frustration among educators, who are desperate to see systems that value more than incremental academic growth. As Montgomery County Superintendent Joshua Starr put it, policymakers need to “stop the insanity” of evaluating teachers via a formula that is based on “bad science.” Starr’s critique was echoed by Seattle teacher Jesse Hagopian. “We’ve been raising our voices about this deeply flawed test for a long time,” he said. But now that the district is using it for evaluations, “we’ve drawn our line in the sand.” And then there’s Texas education commissioner Robert Scott, who has decried the ways student testing had become a “perversion of its original intent,” and promised he would do whatever he could to “reel it back” in the future.

To be sure, the American test obsession still has a firm hold on our collective psyche, and with Common Core assessments around the corner, we’re a long way off from the Finnish model — in which there are no national tests and all student assessments are devised and administered locally by teachers. But what seems equally clear is that a new sort of idea virus is gaining strength in education circles. And as Malcolm Gladwell explained in “The Tipping Point,” “ideas and products and messages and behaviors spread just like viruses do. When we’re trying to make an idea or attitude or product tip, we’re trying to change our audience in some small yet critical respect: we’re trying to infect them, sweep them up in our epidemic, convert them from hostility to acceptance.”

To convert their opponents from hostility to acceptance, educators will need to clarify more than what they’re against; they’ll also need to propose specific and realistic alternatives. Josh Starr is off to a good start: he proposes creating assessments for Common Core-aligned curriculum by crowdsourcing their development and letting teachers design them — rather than the private companies. And the good news is there are other big ideas out there, and other places where effective alternatives to standardized testing already exist (visit http://performanceassessment.org/ for examples).

Perhaps, then, 2013 will finally be the year that educators end a decade of test obsession — and bring the noise.

Visit Sam’s web site at: http://samchaltain.com/ and follow him on Twitter at:@samchaltain

*This article does not necessarily represent the beliefs of the MAST Board of Directors or the MASTHEAD staff.
Homework Assignments that Engage Students, Foster Creativity, and Teach Content

By Susan Plati, Biology Teacher  (s.plati@comcast.net)
Originally presented at the NABT Conference in Montreal, Canada

Getting students to do homework is often a chore, but if the assignments appeal to the students they will often get totally involved to the point that they come in to class waving their homework in their hands as they enter the room. In this handout I have listed a number of assignments that not only are effective in reinforcing and teaching biology content, but also engage the students to such a degree that their finished product is actually fun to grade. Some of the assignments include biology song writing, writing advertisements for body parts or systems, bumper stickers that define terms, the great albino corn plant challenge, the mystery creature assignment, 150 ways to use macaroni, creative writing projects: ride on a chromosome, my life as a carbon atom, my life as a water molecule, ecosystem travel brochure, cinquain poetry writing.

**Biology Song Writing:**
Choose a well-known song that is easy to sing and has several verses. Then choose a topic to write about and divide your class up into groups. Each group writes a verse for the song. The verses are put together into a coherent whole (students can word process their verses directly onto a computer). The song is “published” and sung by the class the next day. For example for “The Cell Song”, each group is given the name of a specific organelle. The verse that is written must define the organelle. When the class has finished they have described the entire cell in song. For “The Classification Song” each group gets the name of a different taxonomic group and must define the characteristics of the group in verse. I often use songs such as On Top of Ole Smokey or The Coffee in the Army. The key to having a successful group sing is: Sing Loud and Sing Fast

**Writing Advertisements for Body Systems/parts:** Students are asked to design an advertisement for newspaper, radio, and television to “sell” a particular body part. Each student is assigned a different organ and then is asked to use his/her imagination as the heart, liver, lungs, brain, red blood cells, pancreas, small intestine, thyroid gland, are defined Madison Avenue style. I once had a student design an entire line of greeting cards that touted the virtues of the liver, stomach, and pancreas. Actually I’m surprised that she didn’t put Hallmark out of business!

**Bumper Sticker Definitions:** Students are asked to design a “bumper sticker” that will define one of the vocabulary words from the unit that is being studied. I usually do this for my ecology unit. They put their design on a sheet of standard 8 1/2 x 11-inch paper that has been cut in half the long way. They are asked to use their word in a saying or in a picture that will define their word. The bumper stickers are displayed around the room for the duration of the unit including during the unit test. One of their test questions asks them to explain their own bumper sticker—why it is effective in presenting the definition that they were assigned.

**Cinquain Poetry Writing:** Here’s another way to teach vocabulary…the idea being that if a student knows enough to write a 5-line cinquain poem, he/she knows enough to define the term. The first line of the poem is the word or phrase that is the subject of the poem. The second line is 2 adjectives that describe the subject. The third line is 3 action words or verbs about the subject. The fourth line is a 4 word descriptive phrase or sentence about the subject. The fifth line is a synonym for the word.

For example:

<table>
<thead>
<tr>
<th>Cell</th>
<th>ribosome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional unit</td>
<td>cytoplasmic organelle</td>
</tr>
<tr>
<td>living, breathing, moving</td>
<td>building, joining, bonding</td>
</tr>
<tr>
<td>Building block of life</td>
<td>Amino acid joining structure</td>
</tr>
<tr>
<td>Life-unit</td>
<td>protein-synthesizer</td>
</tr>
</tbody>
</table>

After the class has written their illustrated cinquains they are posted around the classroom for all to read. This makes a great quiz if you leave off the subject and ask the students to name the structure that is being described.
**The Great Albino Corn Plant Challenge:** After completing the heredity/environment lab using 3:1 Green/albino corn plants, students are challenged to raise an albino corn plant to maturity. (This was evidently done in the 1950’s as a science fair project). I tell students that if they can do this successfully I’ll give them an automatic A for the year. No one of my students has ever succeeded in doing this, but many have done the preliminary research and tried foliar feeding, adding glucose solution to the soil, injected glucose into the vascular tissue. In so doing, they have learned a lot about transport in plants, the process of photosynthesis, the difference between sucrose and glucose, and a host of other information. I do give the students who try, extra credit if they write up their work in their lab notebooks.

**The Mystery Creature Assignment:** Each student in the class is given a different “mystery creature” that has been placed in an empty film canister. The mystery creatures include, a mealworm, a rusty nail, a seed, a grain of sand, a “ghost crystal” (polyacrylimide gel), dry yeast, a leaf from a plant, pond water green with algae, and an assortment of other items both living and non-living. (Once I gave someone an Access Excellence Flashing Pin) Students are then asked to take their mystery creatures home and write a paragraph in which they indicate whether their creature is living or not and the various reasons that have led them to this decision.

**Creative Writing Assignments:** Students are asked to write a page in which they describe a particular event in a creative way. For example, after completing a study of mitosis, the students were asked to pretend they were miniaturized and “taking a ride on a chromosome”. The ensuing descriptions were a great way to assess their understanding of this process. Another time the students were assessed in their understanding of the water cycle or the carbon cycle by describing one of the following: 1. You are an atom of carbon. Describe what you’ve been doing for the past several centuries. Or 2. You are a water molecule. Describe what your life has been like for the past several centuries.

**Ecosystem Travel Brochure/ Chemical Element Brochure/ Planetary Travel Brochure:** I’ve taught biology, chemistry, and earth science during my teaching career and this assignment has never failed to bring out the creativity of my students. The teacher sets the parameters. The students then follow these directions to make a tri-fold brochure about a specific ecosystem, a specific chemical element, or a planet in the solar system. Usually I write the directions in the form of the brochure that they are writing. On the cover I’ll have the title of the assignment and say what belongs on the cover…. Then I follow this format for each of the other pages in the tri-fold format.

**Evolutionary evidence Newspaper:** (A jigsaw cooperative learning activity) Students work in groups of 4. Each of the 4 students first works with students from other groups to become an “expert” in one of the following areas: embryology, paleontology, physical anthropology, evolutionary biology. When expertise is achieved, students reconvene in their original “Newspaper Groups” to design a newspaper and to teach the other group members. The group designs the banner for the paper (Evolutionary Times, The Fossil Record, The Daily Strata, etc.) Each of these groups designs a newspaper on a piece of chart paper in which each expert writes at least one column. The columns are written at home. Columns can be feature articles, cartoons or comic strips, travel features, gossip columns, movie reviews, personals. Students are limited only by their imagination.

**Letter from Charles Darwin to his father:** Students watch PBS video—Darwin’s Dangerous Idea. Then they plot his travels aboard the HMS Beagle on a map and read selected excerpts from Darwin’s diary. Each student gets a different excerpt. Student must write a letter as if he/she were Darwin writing home from the place his/her excerpt describes. The diary excerpts are available at pbs.org/evolution.

**100 different Ways to Use Macaroni:** Brainstorming your way into creative assignments. When I’m bored with the assignments that I’ve been giving, I like to brainstorm with colleagues. I usually find that by setting a topic such as list all the ways that you could use macaroni in an assignment designed for your kids, and then brainstorming for 15 minutes the group easily comes up with 100 new assignments…. Some are mundane…. Some are off the wall…. But the ideas flow and usually so do several new assignments. For example: Uses of macaroni: models of cell parts, string together to make protein chains, glue together to make molecular models, sorting into groups, classifying in a hierarchical system, use spaghetti bundles to model muscle filaments etc. etc. I typed these 7 uses in less than a minute with no one to brainstorm with except my barking golden retriever.
All current dues paying members of MAST are eligible to apply for the Elaine Adams Professional Development Grant, established in memory of Elaine Adams, chemistry teacher at Phillips Academy and one of the four founders of the former Science Teachers Area Resource Swap (STARS).

This year one $500 award will be presented to an applicant who proposes pursuing a professional development venture that is interesting and new for themselves and that has the potential to be of use/value for their students and science education. Recipients are expected to present a workshop at an upcoming MAST Conference. Prior winners may apply again but, in the case of a tied decision, new awardees will be given priority over previous winners.

2013 Application Form

Part I
Name: __________________________________________________________
Address: _________________________________________________________
Telephone Number: _________________________________________________
E-mail Address: ____________________________________________________
Supervisor’s Name & Title: __________________________________________
Supervisor’s Address: ______________________________________________
Supervisor’s Telephone Number: _____________________________________
Supervisor’s E-mail Address: _________________________________________
(You/your supervisor would be contacted only if additional information is needed.)

Part II
On a separate sheet of paper (not to exceed one page) describe:

- Your current teaching role and location
- How you will use the funds
- How is this project new/of interest to you
- Benefits you hope will accrue for you/your students/science education

Refer questions to Betsey Clifford at Betsey.clifford@gmail.com

Application deadline is April 15, 2013

Applications can be mailed/e-mailed to the Selection Committee in care of
Betsey Clifford, 1594 Central Street, Stoughton, MA 02072 or Betsey.clifford@gmail.com
Massachusetts Association of Biology Teachers (MABT)

MABT is an affiliate of the National Association of Biology Teachers, and has recently become an affiliate of MAST. The board meets monthly to discuss upcoming programs and work on planning the spring Professional Development Conference. We’re very excited about this year’s conference, the theme of which is “Teachers and Students as Scientists—Modeling the Scientific Process”. The date is Saturday, March 16, 2013. The place is Framingham State University.

The spring conference is the highlight of the year. Not only does it give teachers an opportunity to interact with each other, but also it provides us with many updates and ideas to take back to our classrooms. Registration forms for our spring conference at Framingham State on Saturday, March 16, 2013 “Teachers and Students as Scientists—Modeling the Scientific Process” follow. This conference will attempt to show the opportunities that exist for teachers and their students to work with scientists and engage in research. It will also demonstrate some of the best examples of science inquiry in the classroom.

We’ll begin at 7:45 with coffee and muffins and registration. This will be followed by a keynote address by Dan Bisaccio who has been leading research courses for teachers and students in the Yucatan since 1995. Dan is the Director of Science Education at Brown University, an adjunct researcher for the Smithsonian Institution’s Monitoring and Assessment of Biodiversity Program, and an education outreach volunteer for the United Nations Environmental Program’s Convention on Biological Diversity. The rest of the morning will be devoted to a variety of workshops. This is followed by lunch and afternoon workshops. The cost for the conference, including membership in MABT is $60. For new teachers (1-3 years) the cost is $35 and includes membership in MABT. Morning coffee and lunch are included in the conference registration fee. We hope you’ll be able to join us for this annual event.

MABT has a new website at http://massbioteachers.blogspot.com. At this site one can access information about joining MABT, download forms for membership, and get information about the Don Bockler Award and the Paul King Award, as well as a number of other programs. There is also direct access to the National Association of Biology Teachers and MAST. Members of MABT are added to the “Alert”, a monthly (and sometimes bi-monthly) e-mail that lets members know of programs for students and teachers, and gives direct access to information that biology teachers find beneficial to them and to their classes.

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Conference Chair--Margaret Carroll, Framingham State University  
Membership Chair--Chris Brothers, Falmouth Public Schools  
Alert Editor--Brian Dempsey, Acton-Boxboro Public Schools

General e-mail is massbioteachers@gmail.com
Teachers and Students as Scientists—
Modeling the Scientific Process
Massachusetts Association of Biology Teachers
Annual Meeting and Conference
Saturday- March 16, 2013 at Framingham State University

Registration and Coffee 8:00-8:30
Speakers/Workshops/Lunch 8:30-3:45
Directions can be found on the Framingham State University web site:
http://www.framingham.edu/directions.htm
Park in the Normal Hill Lot, the Conference is in Hemenway Hall (See Map):
http://www.framingham.edu/buildings.htm

Speakers and Workshops

Students become scientifically literate through the “undertaking” of science—an active process that allows them to develop scientific habits of mind. Participants of this keynote address will learn how to engage students with real scientific inquiry that makes a difference. An example will be presented by students and teachers working with HabitatNet, a Global Biodiversity Monitoring Project. Student research from this project has been presented to the United Nations Convention on Biological Diversity and the Smithsonian Institution, and published in peer-reviewed journals.

The disappearance of the dinosaurs at the end of the Cretaceous period posed one of the greatest, long-standing scientific mysteries. This three-act film tells the story of the extraordinary detective work that solved it. Representing a rare instance with which many different scientific disciplines—geology, physics, biology, chemistry, paleontology—contributed to a revolutionary theory, the film is intended for students in all science classes.

A. Oasis in Space: Is Earth the only planet with life? Ed Jameson, Mary Liscombe, and Evan Pagliuca, Christa Corrigan McCauliffe Center. (This will take place in the new planetarium.)

B1. Museum Institute for Teaching Science Summer Opportunities for Teachers. Jane Heinze-Fry, Ph.D., and Tim LaVallee, Ph.D., Program Director and Associate Program Director for MITS.
B2. The JASON Project - A teacher’s Argonaut Experience on board the Nautilus. Dennis Durkin, King Phillip Regional High School.

C. Science of the Eye: How we “see” color.
Ishara Mills-Henry, Ph.D., Framingham State University.

D. Fast Plants: A New Generation of Resources for Hands-on Education in Genetics, Evolution, and Genomic Sciences. Scott Woody, University of Wisconsin-Madison, Madison, WI.

E1. From Phage to Neuroscience: Summer Programs for Teachers, Mandana Sassanfar, Ph.D., MIT Biology Department
E2. Unexpected Experimental Results May Lead To Further Research. Susan Plati, Millis and Brookline High Schools, retired.

Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic and Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration and Coffee</td>
<td>8:00-8:30 Room 107 - off the first floor entrance lobby</td>
</tr>
<tr>
<td>Keynote Address</td>
<td>8:30-9:30 Dan Bisaccio, Brown University, Hemenway Hall Room 212</td>
</tr>
<tr>
<td>Lunch &amp; MABT Annual Meeting</td>
<td>11:45-12:45 College Center Forum</td>
</tr>
<tr>
<td>Keynote Address</td>
<td>3:00-3:45 HHMI Presents: The Day the Mesozoic Died, Hemenway Hall 212</td>
</tr>
</tbody>
</table>

Two ways to register:
1) Online: Go to this URL: [http://mabt2013.eventbrite.com](http://mabt2013.eventbrite.com) (It’s easy and quick!)

OR

2) By Mail: Complete form below and send with payment to: Shelly Pagnotta, MABT Treasurer, 9 Flomun St., Walpole, MA 02081. Please postmark your registration by March 12th (after this date, please register at the door).

Make checks payable to: MABT.

Name________________________ Phone________________________
e-mail (Please Print Clearly)________________________
Address________________________
City/Town________________________ State_____ Zip__________

School________________________ School city/town________________________

Workshop Selection: Please Rank Workshops in Order of Preference (Workshops are listed by letter above). Register early to get your first choice; space is limited workshop seats cannot be guaranteed.

Morning: Workshop A _______ Workshop B _______ Workshop C _______

Afternoon: Workshop D _______ Workshop E _______ Workshop F _______

*Please note, for the one-hour workshops, registration is for both parts of workshop. B1 and B2 and E1 and E2 are registered for together.

Select Level:

- _____ $40 (conference** by 3/12) + $20 (renewal) = $60
- _____ Registration at Door (with membership) = $65
- _____ New members since October 1, 2012 = $45
- _____ New teachers (within first 3 years with membership) = $35
- _____ Student teachers (with membership) = $25

Total Enclosed: __________

** Morning Coffee and Lunch are included in conference registration fee.
PTC STEM Certificate Program Kick-off

In January of this year, the Christa McAuliffe Center at Framingham State University, in partnership with PTC, inc., kicked off a STEM Certificate program focused on providing teachers with training, tools, and resources to enrich STEM education in New England. Twenty-five teachers from across the states of Massachusetts, Rhode Island, and New Hampshire are currently participating in the first offering of the program, which runs from January until August.

The program consists of a graduate-level course that runs from January-March, followed by two practicums that will run through the summer. Participants are able to receive graduate credit and/or PDPs for their participation in the program, and will walk away with a $50,000 software package available through PTC, inc., as well as the opportunity to obtain software licenses for their classrooms/schools. In addition to this, they have the opportunity to:

- Learn about STEM technologies used by engineers through an online delivery format
- Engage in hands-on exercises
- Participate as teaching assistants in delivering STEM workshops to worldwide audiences using exciting online collaboration technologies
- Learn STEM tools and how to create classroom activities using these tools to inspire students to explore careers in STEM
- Develop plans for improving STEM education in their schools/institutions/communities
- Earn graduate credit and/or PDPs

A second offering of the program will begin in the summer/fall 2013 time frame. If you are interested in participating, or would like to know more about the program, please contact Alyssa Walker at awalker4@framingham.edu, or 508-626-4057.
MEES Conference 2013:
Strengthening Communities: Branching Out, Reaching In

Join us on Wednesday, March 6, 2013 for the MEES annual Conference. The theme this year is “Strengthening Communities: Branching Out, Reaching In”. Join fellow environmental educators and advocates in a day of problem-solving and discussion. Rebuild your excitement and commitment to our natural world and gain a fresh new perspective on the tools of the environmental education trade.

Conference Information:
Wednesday, March 6, 2013
College of the Holy Cross
Hogan Campus Center
Worcester, Massachusetts

Conference Brochure

Conference Schedule:
8:15-9:00 am - Registration, Coffee, Exhibits
9:00-10:15 am - Session A
10:30-11:45 am -Session B
12:00-12:45 pm - Lunch, Annual Meeting
12:45-1:15 pm -Exhibit Session
1:15-2:30 pm- Session C
2:45-4:00 pm-Session D

Cost: $90 Scholarships and Student rates available! All attendees of MEES's annual conference are extended an annual membership. Membership entitles you to all the services that MEES provides, including the society's quarterly e-newsletter, The Observer, and full access to www.massmees.org.

Register for the conference

For any questions, email Nicole Scola at nscola@massmees.org

For exhibitor information, please contact Alex Dunn at exhibitors@massmees.org

Visit our website www.massmess.org for more information.
GOT CURRENTS?

Build-your-own-drifter
Educator professional development workshop

Looking for a unique and meaningful way to teach oceanography while connecting students to real-science tools and applications of technology? Build your own ocean-going drifter and deploy it. Your students will be amazed as they watch and learn in real-time how surface ocean currents circulate in your area. Professional development around using ocean observing data and tools in the classroom will be included.

WHEN:    Saturday, March 9, 2013
          10:00 am to 4:00 pm (BYO lunch)

WHERE:   NOAA Northeast Fisheries Science Center
          Woods Hole, MA

WHO:     Teachers and informal science educators

COST:    $500* per drifter (teams welcome)
         Some scholarships are available
         * actual cost may vary based on desired satellite coverage

For workshop and registration info, visit www.massmarineeducators.org/opportunities.php

For general information about the drifters, visit www.neracoos.org/drifters

Sponsored by the Massachusetts Marine Educators, Northeastern Regional Association of Coastal Ocean Observing Systems, and the NOAA Northeast Fisheries Science Center
**Student Opportunity:**

Announcing the First Annual
North Shore High School Marine Science Symposium
*Wednesday, March 20, 2013*
Endicott College, Beverly, MA

The Massachusetts Marine Educators have been running a high school marine science symposium on the South Coast/MetroWest for 30 years. It’s time to bring that event to the North Shore!

Please join us for an exciting glimpse into the marine world through a diversity of perspectives from around Massachusetts. Presenters will include folks from the Ocean Alliance, Massachusetts Division of Marine Fisheries, Ocean Genome Legacy, Northeastern University, Salem State University, Burnham Boatbuilding, and others. Students will have the opportunity to investigate current and on-going projects in marine science and related disciplines.

**Symposium Schedule:**

- **8:00 am** Registration
- **8:45 am** Introduction and Welcome
- **9:00 am** Keynote Address 1
- **9:30 am** Break
- **9:45 am** Workshop A
- **10:45 am** Workshop B
- **11:45 am** Keynote Address 2
- **12:15 pm** Lunch
- **1:00 pm** Adjourn

**Workshops:** There will be 10 hands-on marine science workshops that will be repeated in each of the two time slots. Students will attend two workshops during the day in addition to the two keynote addresses. Once the program is finalized, you will be asked to submit your students’ preferences. However, workshop attendance will be assigned by MME on a first-come, first-served basis.

**Cost:** $10 per student includes registration materials and morning refreshments.

**Other logistics:** Student participants must provide their own lunch or purchase lunch at the cafeteria. Teachers and chaperones will be provided boxed lunches. Students must be accompanied by a teacher and/or chaperone at all times. We recommend a ratio of one adult for each ten students. Schools are responsible for their own transportation.

Space is limited and registration will take place on a first-come, first-served basis. Payment can be made by check or credit card, however if paying by check, a purchase order number must be provided at the time of registration. Please register here: [https://massmarineeducators.wufoo.com/forms/2013-north-shore-hs-marine-science-symposium/](https://massmarineeducators.wufoo.com/forms/2013-north-shore-hs-marine-science-symposium/)

If you have any questions, please email Mariah at mscountreach@gmail.com or call 781-581-7370, x321.

*Sponsored by the Massachusetts Marine Educators, Endicott College, and Northeastern University*
"You may find it hard to swallow the notion that anything as large and apparently inanimate as the Earth is alive.”

James Lovelock’s *The Ages of Gaia*

We must look at the Earth as one living thing with many complex interacting systems necessary for its survival.

**Saturday, April 6th 8:30 am - 4:30 pm**

Redfield Building at Woods Hole Oceanographic Institution

**Schedule**

- **8:00 am** New Member Reception
- **8:30 am** Registration in Redfield 204
- **9:00 am** Welcome and Opening Remarks
- **9:15-2:30 pm** Three Speakers, Door Prizes, Awards, Chowder and more
- **2:45-4:15 pm** Afternoon Workshops, Tours, and Field Trips
- **4:30 pm** Social Reception: Sea Education Association. All are invited!

**Featured Speakers**

**Kevin J Anchukaitis,** Assistant Scientist, Dept. of Geology and Geophysics, WHOI

Two others TBA

**Afternoon Workshops**

- Science Cruise with The Zephyr Education Foundation Inc.
- WHOI Dock Tour with Hovey Clifford

Lesson Share: Come prepared to share a lesson and receive lessons related to *The Global Ocean*

**Awards**

Know someone deserving of an MME award? Visit [www.massmarineeducators.org](http://www.massmarineeducators.org) for award details. Deadline is February 28, 2013. Send all nominations to Lydia Breen at lbreen@stonehamschools.org

**Registration**

Registration can be completed at the following link:

Our professional development programs are designed to provide unique first-hand experiences in inquiry-based science to all participants through exhibits, behind-the-scenes tours, field trips and engaging classroom activities. Our programs draw from educators and scientists from the Aquarium, as well as faculty from outside organizations, schools and universities. Programs are from one to six days long, each one covering topics in life and earth sciences with multidisciplinary connections to math and literacy. Join us this winter and see what you can bring into your classroom!

Changing Oceans: Challenges, Impacts and Solutions

Covering about 70% of the Earth’s surface, our oceans play a critical role in our lives. Scientists have identified five major challenges (climate change, overfishing, invasive species, pollution and acidification) to the oceans. This 4-part course will help teachers understand how these challenges are impacting the marine environment, as well as discuss the solutions and technologies being used to tackle these global issues. Throughout the course, we will hear from Aquarium staff, local experts and showcase activities that are meant to improve student understanding of the problems impacting the oceans and how these relate to humans.

Participants will gain content background in ocean science as well as hands-on practice in inquiry-based classroom activities that adhere to state curriculum frameworks. Participants will receive all lesson plans as well as a variety of resources to use in their classroom.

For: Educators, Grades 7– 12 (others also welcome)
Cost: $200
Credit: 20 PDPs or 2 graduate credits from Cambridge College (additional fee - $100)
Location: New England Aquarium
Registration Deadline: March 1, 2013

Course Schedule

Saturday, March, 9 & Saturday, March 16
8:30 a.m. – 4:00 p.m.
These two sessions will explore the major challenges to our oceans, as well as associated impacts and solutions. Programming will include hands-on activities and presentations from experts in the field.

Thursday, April 4
4:00 p.m. – 8:00 p.m.
“Do Fish Sleep?” workshop and lecture with Dr. Judith Weis, Rutgers University professor and author (dinner included).

Thursday, May 9
4:00 p.m. – 8:00 p.m.
Course wrap-up and lecture by Dr. Ben Halpern on the Ocean Health Index, a brand new way to measure ocean health (dinner included).

For more information or to register, contact the Teacher Resource Center at trc@neaq.org or 617.973.6590
Incorporating STEM in Math & Science with Engineering Design

MiddleWeb at [http://www.middleweb.com/](http://www.middleweb.com/) is all about the middle grades with a sharp focus on teaching and learning specializing in Grades 4-8 news and resources. As part of the new MiddleWeb experience, MiddleWeb formed a partnership with the SmartBrief Education news team to produce the twice-weekly MiddleWeb SmartBrief e-newsletter. Subscriptions are free and just the STEM blogs alone provide concrete ideas for implementing STEM into your lessons, district, and professional development. Known as STEM Imagineering, Middle Web Blogger Anne Jolly’s posts bring understanding and clarity to the importance of incorporating STEM lessons into the middle school curriculum. In addition, she works closely with the Mobile Area Education Foundation in Mobile, AL as they develop STEM Engineering Design modules for the Mobile County Middle Schools. These modules, Engaging Youth through Engineering (EYE), are six years in the making and continue to evolve. You can read more about the EYE modules by visiting:


Learn more about the EYE development process when you read Anne’s recent blog,


Caroline Goode
Christa Corrigan McAuliffe Center

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**Check out the MAST website for the latest updates!**


- **News** - RSS feeds with articles about several science fields. This can be great for science in the news!

- **Opportunities** - This section has a tab with opportunities for teachers and one for students. It also has a section for awards that teachers can apply for or nominate a colleague.

- **Resources** - Includes tabs with resources for elementary, middle, and high school science. Have a favorite website? Send it to Don Donovan at ddonovan@thayer.org. The educational institutions tab features our affiliates and other local organizations. Finally, the MASTHEAD includes some sample past editions along with the pricing for ads.

- **About Us** - Scroll down to the bottom of the page and click “About Us” to see current board members.
A Field Course in Measuring & Monitoring Biodiversity at Nuevo Durango Maya Community (Terrestrial) & Marine Ecosystems - Quintana, Roo, Mexico

http://www.habitatnetfieldstudies.com/

August 3 - 10, 2013

Cost: $ 1,340 (Plus your airfare)

The Nuevo Durango Maya community is located 100 kilometers southwest of Cancun in the central region of the Yucatan Peninsula. The enormous biological diversity is recognized by both the Center for Ecological Studies (Mexico) and the World Wildlife Fund as a global natural resource.

Participants will be staying in traditional Maya cabins in a Mayan community located near the famous Coba archeological site (which we explore during the week). This area is only open to field researchers and is home to over 400 species of birds (equal to the number of bird species found in all of North America), stable populations of jaguar, ocelot, and spider monkeys. Additionally, in a one acre plot, there are more tree species found than in all of North America.

A scientific purpose of this course is to establish baseline data on the biodiversity at this Mayan site. During the course, participants will study tropical botany while learning field method protocols and subsequently conducting biological diversity research. Invertebrate and vertebrate field surveys will introduce participants to sampling methods and subsequently, the variety of wildlife found at the reserve. Evenings will include night hikes and seminars discussing issues in conservation biology. Overall, this is an unusual and unique field program in that it allows participants an opportunity to conduct authentic field research while learning field methods.

We will also spend the 1st and 2nd weekend exploring the marine ecology of the world’s 2nd largest barrier reef snorkeling on the reef weekend 1 and spending our last full day off-shore snorkeling with migratory whale sharks (Earth’s only plankton feeding shark species!).

Dan Bisaccio has been leading these research courses in the Yucatan since 1995. Dan is the Director of Science Education at Brown University, Providence, Rhode Island. He is also an adjunct researcher for the Smithsonian Institution’s Monitoring & Assessment of Biodiversity (SIMAB) Program and education outreach volunteer for the United Nation Environmental Program’s Convention on Biological Diversity.

*If interested, please email Dan Bisaccio by April 15, 2013 at Daniel_Bisaccio@Brown.edu
Spring Meeting of New England AAPT
April 12/13, 2013
at Milton Academy
Strengthening the Pedagogy of Physics Teaching
http://aapt-nes.org/spring-2013-meeting/

Agenda

Friday Night:

Keynote Speaker: Ronald Thorton
Demo Sharathon
Contributed Poster Presentations

Saturday:

Contributed Oral Presentations
Invited Speakers Jerry Touger and Alex Griswold
Panel Discussion on Minute Physics and What we should be teaching
Remote Address from AAPT HQ
Demo Show

Workshops

Call for Presenters: Submit an abstract for a poster (Friday Night) OR oral presentation (Saturday Morning). We are looking for both poster presentations and oral presentations. Deadline March 9th.

We accept all papers related to the teaching of physics, but are particularly interested in submissions for the following strands:

1. Transitioning to the Teaching of Physics from other Careers
2. Physics Education Research
3. Methodology and Curriculum in Pre-service Teaching Programs

Workshops include: Modeling, Collaboration Software, and Photoelectric Make n Take.

Registration information available online
Registration Fee: $40
Green Ambassador
Youth Job Description

Green Ambassador Program is a workforce development program that gives young people of Boston employment in Green Career Exploration, Environmental Awareness and Stewardship, and Boston Harbor National Recreation Area Historical Education. The program combines job readiness training with career exploration, environmental education, character building, leadership and stewardship.

TYPE OF POSITION: Seasonal (Summer)
WORK WEEK: Tuesday - Friday, 7:45 AM – 5:00 PM, plus 2-3 overnights
PAID WORK START/END DATES: July 1st – August 16th, 2013 (except July 4)

JOB DESCRIPTION:
Green Ambassadors will:
• Work primarily outdoors in all weather conditions.
• Learn trail maintenance skills and techniques
• Participate in invasive species removal
• Explore science-monitoring and data collection
• Engage in outreach projects
• Develop carpentry and building skills
• Learn about urban agriculture
• Explore different career opportunities within the Harbor Islands as well as the Green Career Industry
• Work side by side with six to nine other employees on projects
• Participate in multi-night camping expeditions on the Harbor Islands

Green Ambassadors will work directly with marine scientists, educators, National Park Staff, and other natural resource departments in the Boston Harbor.

QUALIFICATIONS:
• Residents of Boston
• Between the ages of 15 and 18
• Interested in working outdoors, developing leadership skills and learning about environmental stewardship
• Interested in learning about Outward Bound and/or the National Park Service.
• Good work ethics (showing up on time, calling if you are sick, wearing a staff t-shirt every day, having a good attitude, etc.)
• A commitment to work the entire duration of the program

For More Information:
Please contact: Olga Feingold at 617 830 5120 or ofeingold@thompsonisland.org.
Check us out on Facebook: Boston Harbor Green Ambassadors
Thompson Island Outward Bound: www.thompsonisland.org/youth-programs/youth-jobs-program
National Park Service: http://www.nps.gov/boha/parkmgmt/islandambassadors-greencorps.html
Schooling with Whales

Whales may not travel in schools the way that fish do, but they can be used within several disciplines in a school building to help us teach several important concepts. This ten hour workshop will demonstrate ways to use whales and their kin to teach food chains, math, geography, reading comprehension and taxonomy. You’ll leave with a packet of activities, links to useful web sites and a greater appreciation for whales, dolphins and porpoises.

**Target audience:** Teachers of grades 3-6

**Graduate credit and PDPs:** Teachers may choose to earn one graduate credit or 10 PDPs for 10 hours of class time. Credit is optional and costs $50.00 payable to Cambridge College. PDPs are free and will be granted by Museum Institute for Teaching Science (MITS).

**Meeting time:**
- Saturday March 16, 2013 8:30a – 4:30p and
- Sunday, March 17, 2013 12:00p – 4:30p

**Location:**
- New Bedford Whaling Museum 18 Johnny Cake Hill, New Bedford, MA

**Instructor:**
- Robert Rocha Science Director, New Bedford Whaling Museum

**Cost:** $30.00 tuition payable to New Bedford Whaling Museum, $50.00 one graduate credit from Cambridge College

**Course description:** This ten hour course will introduce teachers to whale/cetacean related topics which can be used to teach concepts prescribed by state science and mathematics frameworks. Each session will include information, practice of math and science activities for students, and take-home resources for teaching each concept.

**Course objectives:** Participants will be able to: Explain the anatomical differences between toothed and baleen whales. Use inexpensive props to teach these features to their students. Utilize a conversational story about young whales to teach comprehension and reading skills. Use a dichotomous key to identify several cetacean species. Explain transfer of energy through marine ecosystems. Utilize a variety of cetacean facts as the basis for mathematical comparisons, conversions and calculations. Use historical whaling data as the basis for mathematical word problems. Understand the historical whaling connection between this region and the Azores. Take absolute locations from a primary source document and plot them on a map. Describe the natural history of several species of whales found in New England.

**Course expectations:** Participants taking the course for credit will be expected to:
1. Attend both classroom sessions
2. Take a pre- and post-workshop assessment quiz to gauge effectiveness of the course
3. Complete reading and homework assignments and submit lesson plan by due date
4. Participate in class activities and discussions
5. Develop a lesson plan for their own use

**Course requirements:** Participants will complete homework assignments as assigned. The major assignment for the course is for teachers to develop a lesson plan or unit for their own classes. The lesson will be based on material presented in the course. The format for the lesson plan will include sections on Title, Grade level to be taught, Relevant state science or math standards, Main concepts, Materials and equipment, Background information, An outline of the lesson, Tips and hints for other teachers, Your sources of information. Teachers may work alone or with partners to develop the lesson. The goal is for teachers to develop a lesson that they will use. Each teacher will present an outline of the lesson plan on the last day of classes. Sample lesson plans will be provided as guides to the content and extent of the required lesson plans. The completed lesson will be due May 3, 2013.

**Grading criteria:** Class participation will count as 15% of the grade. Completed assignment will count at 85% of the grade. Participants taking the course for PDPs but not for graduate credit will not be graded but must turn in a lesson plan by Friday, May 3, 2013.

**Contact:** Robert Rocha, New Bedford Whaling Museum, 18 Johnny Cake Hill New Bedford, MA 02740, (508) 717-6849, rrocha@whalingmuseum.org for more information.
Save the Date!

Present a Workshop at NSTA 2014!

The deadline to submit workshop proposals is April 15, 2013. Confirmations for accepted sessions will be mailed in October.

Conference Strands:

- Science and Literacy: A Symbiotic Relationship
- Teaching Elementary Science with Confidence!
- Leading from the Classroom
- Engineering and Science: Technological Partners

For suggestions and more information about presenting at NSTA go to: [http://www.nsta.org/conferences/sessions.aspx](http://www.nsta.org/conferences/sessions.aspx)

Contact Marilyn Richardson, Program Coordinator, at [Marilyn@pcom.com](mailto:Marilyn@pcom.com) with questions.
MAST Vacancy Announcements

Please read the descriptions that follow and consider applying for an open position. Serving on the MAST Board is a great way to get some leadership training and professional development. Please contact Betsey or another member of the Board with questions.

To apply, email a cover letter and resume to:
Betsey Clifford, MAST President at Betsey.clifford@gmail.com.

Professional Development Committee Chair

This person leads the professional development committee in training board members and leading professional development events for science teachers throughout Massachusetts. Professional development is crucial to becoming a successful teacher and even more important as we look at implementing the new science standards in the near future. This person must be organized and have experience facilitating professional development and leading a group.

County Director: Barnstable, Bristol, Hampden, Suffolk

To qualify for one of the vacant county director positions, you must work in Bristol, Hampden, or Suffolk county. The role of the county director is to organize professional development for members in the county, communicate with teachers in your county, and be an active member of the board of directors by regularly attending meetings. MAST will train you in the necessary professional development. Experience is encouraged.

Elaine Adams Professional Development Grant Coordinator

The coordinator advertises for and collects applications for the Elaine Adams Professional Development Grant. He/she works with readers to select the recipient of the grant and communicate with applicants. This is not a voting board position but the coordinator is encouraged to attend board meetings.

MASTHEAD Layout

This person works with the MASTHEAD editor and Executive Board to do the layout for each edition of the MASTHEAD and the conference booklet. Experience is necessary. We are open to different programs. Must be able to meet deadlines and communicate consistently with board members. This is not a voting board position.
Special Offer for Massachusetts Schools
MASS-ive Savings on School Field Trips!
Bring your class March 4 - 22, 2013 and visit for just $5 per person.

School Field Trip Admission Prices (per person)

<table>
<thead>
<tr>
<th></th>
<th>If you visit between March 4 - 22, 2013</th>
<th>Regular Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Admission</td>
<td>$5</td>
<td>$9</td>
</tr>
<tr>
<td>General Admission + Movie or Show</td>
<td>$11</td>
<td>$15</td>
</tr>
<tr>
<td>General Admission + Discovery Center Lab</td>
<td>$11 ($15 per person in addition to General Admission)</td>
<td>$15</td>
</tr>
<tr>
<td>Triple Combo: General Admission, Lab Program, &amp; Movie or Show</td>
<td>$17</td>
<td>$21</td>
</tr>
</tbody>
</table>

To book your Field Trip, fill out a field trip reservation request worksheet available at www.CTScienceCenter.org/booknow

To contact the Reservations Center please call (860) 520-2150 or reservations@CTScienceCenter.org.

Featured Exhibit

IDENTITY
AN EXHIBITION OF YOU

JANUARY 18 THRU APRIL 21, 2013
Presented by TRAVELERSTM
Massachusetts Association of Science Teachers

“To enhance science teaching and empower teachers of science”

Membership Form

Thank you for joining MAST! The MAST board is an energetic group of accomplished science professionals that is searching to find exciting, rewarding opportunities for you. The MASTHEAD (our publication) will serve to provide you with updates and photos of important activities. Please get involved and feel free to contact the executive board with suggestions or ideas. Check out our website: www.MassScienceTeach.org.

_____________________________    ____________________________
Last Name                        First Name

______________________________________  _______________________
Home Address                      City/Town

_________________________  __/___/___/___/___/____/___/___/___/
State                           Zip Code                        +4 code

County

(_____)__________________     __________________________________
Telephone                      e-mail address

_________________________                      __________________________
School Name                      City/ Town

_________________________  __/___/___/___/___/____/___/___/___/
State                           Zip Code                        +4 code

County

School Telephone                 Elem.                Middle               High                College

☐ Regular Member                $20
☐ Student Member                $5      (must be in school full time)
☐ Retired Member                $5
☐ Joint Retired MAST/MSELA Membership $15
☐ Joint MAST/MSELA Membership   $35

Make checks payable to: MAST

Mail to: Charlie Bresnahan
MAST Membership Chair
19 Nottingham Drive
Centerville, MA 02632      e-mail: kilo1cb@aol.com