



# Science

## *A Voyage of Discovery*

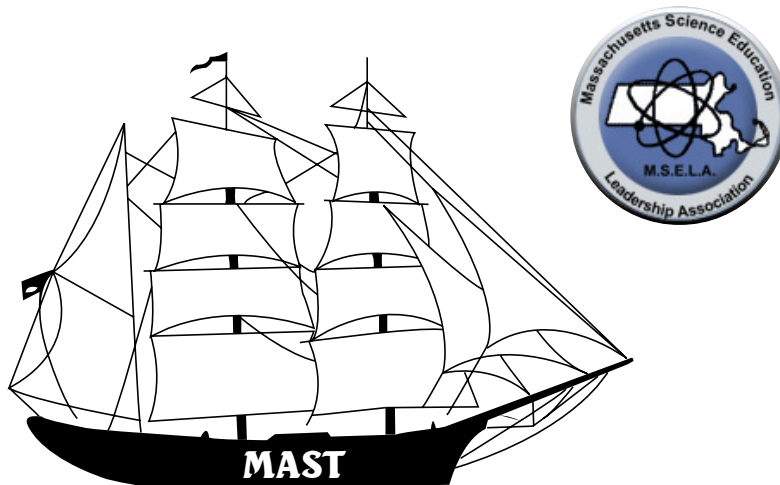
### **MAST/MSELA Fall Conference**

October 22-23, 2009

Holiday Inn Boxborough Woods

Massachusetts Association of Science Teachers  
Massachusetts Science Education Leadership Association

# WELCOME!



**T**he Massachusetts Association of Science Teachers and the Massachusetts Science Education Leadership Association are pleased to be working in partnership to bring you the largest science conference in the state. We have made some changes this year to make the conference even more practical, valuable, and full of variety.

We are adding several new programs for the 2009 conference. First, we will have a strand focusing on marine science. There will be several workshops and displays offered both days. Additionally, there will be a table in the exhibit hall set up to meet and greet your MAST county board representatives and several sessions dedicated to showcase information, resources, and programs from the National Science Teachers Association.

Science is a Voyage of Discovery that engages teachers and students to explore important science ideas and concepts. Teachers realize the importance of understanding science as a way of thinking and find ways to incorporate science into any subject they teach, whether it is language arts, math, music, art, physical education or social studies.

We hope that this conference will help rejuvenate your teaching and provide you with new ideas for your classes. In addition we hope that you will use your time at the meeting to network with other teachers like yourself, spending time exchanging ideas. If you are a veteran teacher and frequent participant at the state science conference, we hope that you will encourage a budding teacher or two to attend with you and that you will advise him or her how to best use the conference time.

The conference this year begins with Registration and continental breakfast at 7:00 a.m. and workshops begin promptly at 8 a.m. You may register for just Thursday, just Friday, or for a reduced fee you can register for both days. When you regis-

ter, you may decide which organization (MAST or MSELA) membership to choose, or you may join both organizations for a reduced fee.

On Thursday, the schedule includes five 1-hour sessions with breaks between each for visiting exhibits and a break for lunch. Some of the workshops are scheduled in double blocks, to provide participants with more in-depth training. PDPs will be available at the end of each day.

The Exhibit Hall will be open both days with nearly 100 exhibitors from commercial and non-profit organizations. We hope that you will enjoy visiting the booths, examining new science equipment and books, and getting advice from the exhibitors.

At 3:15 on Thursday special door prizes will be awarded in the Exhibit Hall. Don't miss your chance to win something great for your classroom!

Immediately after the prizes, MAST will hold a short annual meeting. We encourage you to attend that meeting to learn about the structure and management of MAST, your state chapter of NSTA. If you think you might be able to donate a few hours helping to plan next year's conference, please drop in to the meeting or speak to any board member during the conference. We need many hands to help out, especially in areas related to technology.

Friday begins with a continental breakfast. The Friday workshop sessions include three 1.5-hour blocks, beginning promptly at 8 a.m.; and again the blocks are separated by exhibit times and snack or lunch breaks. The day ends with MAST merriment, and more prizes.

We hope you will be able to take advantage of these exciting and fun-filled two days of professional development.

*Lynn Gatchell and Pat Harcourt, Conference Co-Chairs*

# REVISIONS

## Revisions and Changes!

*This is the Final Conference Booklet; it differs from the preliminary booklet contained in the Fall MAST Newsletter.*

*Late-breaking changes after publication will be shown on a change board near the registration desk.*

## As of September 29

*The following has changed since publication of the Conference Preview.*

Session	Title	Change
All Days	MAST Board and County Directors	Moved to Exhibit Hall
All Days	NSTA Resources and Opportunities for Teachers	Sessions now Thursday 9:15 and 1:00 and Friday at 1:00 only
Thursday 8:00	Cool Tools for Light and Color	New Session
Thursday 10:45	Prentice Hall New Books	Replaced with <i>Fostering Student Ownership to Increase Student Achievement</i>
Thursday 10:45	Engaging ESOL Students in Environmental Science	Cancelled
Thursday 10:45	Hands-on Human Body Systems	New Session – Repeated at 1:00
Thursday 1:00	MIT BLOSSOMS Initiative	New Session – Repeated at 2:15
Thursday 1:00	Hands-on Human Body Systems	New Session – Same as 10:45
Thursday 1:00	MCAS Review Can be Fun!	Moved to Friday 8:00; repeated at 1:00
Thursday 1:00	Sketchbook Naturalists	Extended to two sessions
Thursday 2:15	Sketchbook Naturalists	Extended to two sessions; now starts at 1:00
Thursday 2:15	MIT BLOSSOMS Initiative	New Session – Same as 1:00
Friday 8:00	Green Chemistry - What Every Science Leader Needs to Know	New Session – MSELA
Friday 10:00	MSELA Open Forum	New Session – MSELA
Friday 10:00	Teachers on the Estuary	New Session
Friday 10:00	Who infected whom?	New Session
Friday 1:30	Improving Safety, Reducing Risk and Saving Money	New Session – MSELA

# AT A GLANCE

## Conference at a Glance

### *Thursday, October 22*

Registration	7:00 AM	4:00 PM
Continental Breakfast in Exhibit Hall	7:00 AM	8:30 AM
Morning Sessions	8:00 AM	11:45 AM
Exhibits	9:00 AM	4:00 PM
Exhibits Grand Opening/Break	10:15 AM	10:45 AM
Dedicated Exhibit Time	11:45 AM	12:15 PM
Lunch in Courtyard (ticketed)	12:15 PM	1:00 PM
Afternoon Sessions	1:00 PM	3:15 PM
Special Exhibit Time and Door Prizes	3:15 PM	4:00 PM
MAST Annual Meeting	4:00 PM	4:30 PM
Banquet Reception	5:00 PM	6:00 PM
MAST/MSELA Awards Banquet (ticketed)	6:00 PM	9:00 PM

### *Friday, October 23*

#### **MAST/MSELA COMBINED SCHEDULE**

Registration	7:00 AM	12:00 PM
Continental Breakfast in Exhibit Hall	7:00 AM	8:30 AM
Exhibits	7:30 AM	1:00 PM
Morning Sessions	8:00 AM	11:30 AM
Dedicated Exhibit Time/Break	9:30 AM	10:00 AM
Dedicated Exhibit Time	11:30 AM	12:00 PM
Lunch in Courtyard (ticketed)	12:00 PM	12:45 PM
Afternoon Sessions	1:00 PM	2:30 PM
MAST Merriment (door prizes)	2:30 PM	

## **MAST Conference Contacts**

Co-Chair	Lynn Gatchell	508-693-0974
Co-Chair (Presenters)	Pat Harcourt	508-457-5221
Registration	Joann Blum	508-886-6802
Hotel	Holiday Inn Boxborough	978-263-8701
Commercial Exhibits	ESANE	508-543-7778
Nonprofit Exhibits	Michele Daigle	508-886-6111
Hospitality	Lou Palanzi-Ricker, Marilyn Richardson	603-882-1997
Membership	Sr. Kathy Livingstone	508-791-4947

## MSELA Conference Contacts

Conference Chair	Jim Megyesy	978-985-7605
Registration	Bill Clark	781-647-4036
Membership	David Pierce	508-748-2000



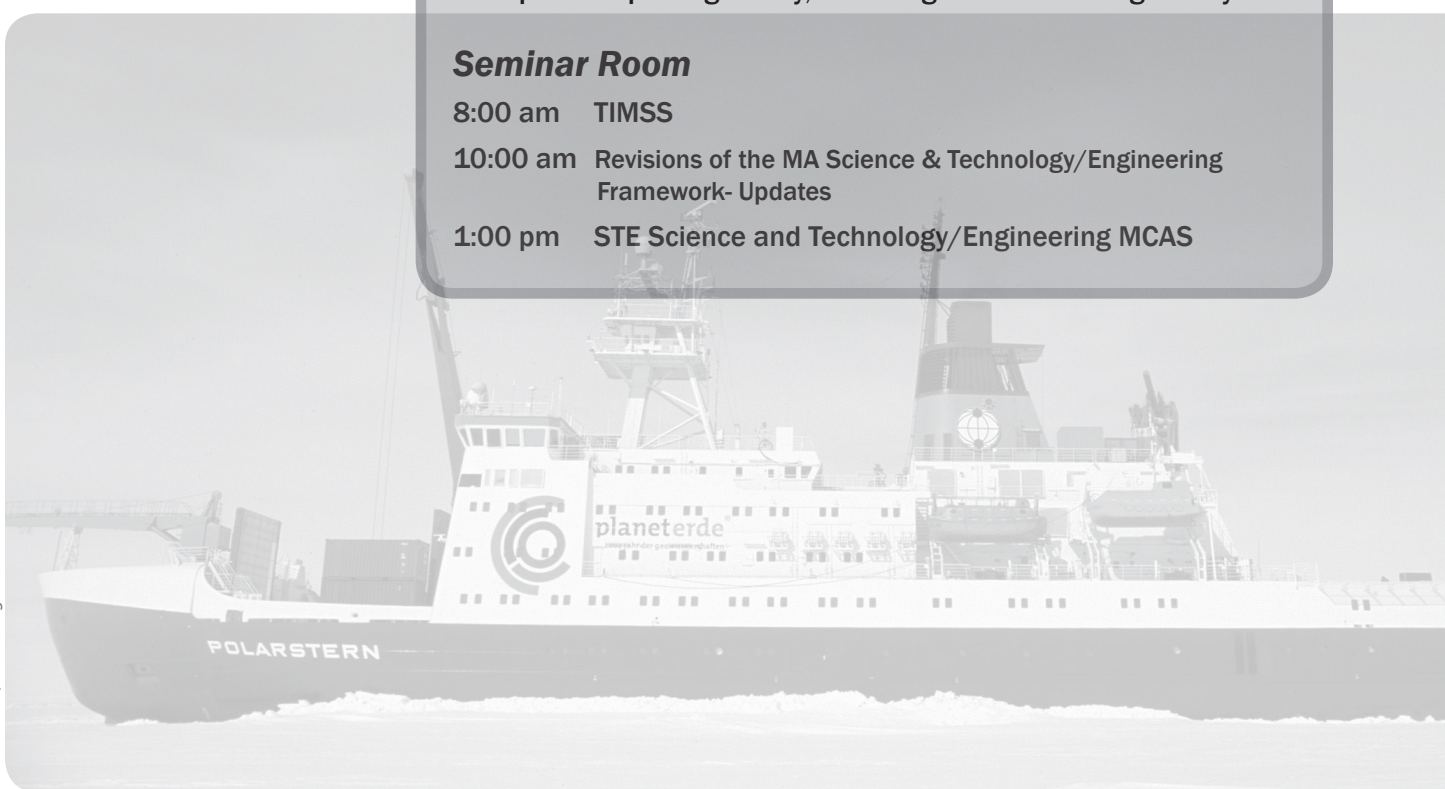
## MSELA FRIDAY SESSIONS

### **Board Room**

- 8:00 am Green Chemistry - What Every Science Leader Needs to Know
- 10:00 am MSELA Open Forum
- 1:00 pm Improving Safety, Reducing Risk and Saving Money

### **Seminar Room**

- 8:00 am TIMSS
- 10:00 am Revisions of the MA Science & Technology/Engineering Framework- Updates
- 1:00 pm STE Science and Technology/Engineering MCAS



## Thursday Highlights

**7:00 am to 4:00 pm**

Registration in Exhibit Hall

**7:00 am to 8:30 am**

Complimentary Continental Breakfast in Exhibit Hall

**9:00 am to 4:00 pm**

Exhibits Open

**10:15 am to 10:45 am**

Exhibit Hall Grand Opening  
Break sponsored by School Specialty

**11:45 am to 12:15 pm**

Dedicated Exhibit Hall Time

**12:15 to 1:00 pm**

Lunch in the Courtyard (ticketed)

**3:15 pm to 4:00 pm**

Special Exhibit Hall Time  
Browse Exhibits; Sign up for DOOR PRIZES.

**4:00 pm to 4:30 pm**

MAST Annual Meeting in Cotillion Room.  
(No elections this year) All MAST members are encouraged to attend!

**4:00 pm to 4:30 pm**

MSELA Meeting in Director

**5:00 pm**

Banquet Reception in Courtyard  
Sponsored by Prentice-Hall

**6:00 pm**

MAST/MSELA Awards Banquet in Courtyard (ticketed)

## Professional Development Points

*Use Attendance at a Mast Conference Workshop as PDP*

- 1** Collect a MAST PDP form at the end of the day of the conference.
- 2** Calculate the total number of hours that you attended workshops. (You must have at least 2 hours.)
- 3** Combine these PDP's with similar topic PDP's from other providers (school systems, other DOE providers) totaling 10 hours.
- 4** Complete a product and present the "package" to your supervisor.

## \$250 Mini-Grant Offered by ESANE

One mini-grant will be awarded during the Conference. After you visit the Exhibit Hall, go to the ESANE table and complete a form to enter in the random drawing. If you win, you can spend the mini-grant on anything you want from vendors who are in attendance at the MAST Conference.

# THURSDAY

Science Discipline Key: (L) Life Science, (E) Earth, (P) Physical, (Prof Dev) Prof. Development, (Tech) Technology.  
Target Group Key: (El) Elementary, (M) Middle, (H) High School, (Adult Ed) Adult Education, (G) General

## MAST SESSION 1

8:00 am to 9:00 am

### 1. Science and Garfunkel: Helping Middle Schoolers Master Objectives Through Music

Presenter: Katie Lewkowicz Excel Academy  
**Board** L El, M

After doing the “Respiratory pokey” and singing along to “I am a mineral” participants will write science songs that not only help students memorize but also ignite their creative energy.

### 2. The Particulate Nature of Matter: Chemical Interactions for Middle School (part 1 of double session)

Presenter: Kathi Brown Delta Education  
**Cotillion** P M

Participants will engage in hands-on/mind-on activities that develop an understanding of matter as particles. Find out how this foundation can and will be use to build other essential chemistry concepts such as kinetic energy. Handouts, materials and books for the first 25 participants.

### 3. FDE/NSA Science and Our Food Supply (part 1 of double session)

Presenter: Janie Chuckran Bridgewater-Raynham School District  
Co-Presenter: Dr. Dave Chuckran SEMASS  
**Deck** L M, H

Session will include discussion and demonstrations on safe food practices, such as critical temperatures to kill pathogens, and contamination simulations. Participants will receive a take-home FDA kit including a CD, video, lab materials, and binder.

### 4. Robotics (part 1 of double session)

Presenter: Gary Garber Boston University Academy  
**Director** P, T M, H

Participants will build a functioning remote control robot from a VEX robotics kit. Participants will be introduced to the tools they need to start a robotics program at their school and have their students enter robotics competitions.

### 5. Cool Tools for Light and Color

Presenter: Steve Cremer Arbor Scientific  
**Seminar Room** P El, M, H

Participants will see and use innovative, hands-on activities and demos related to light and color. Learn about how to teach color addition and subtraction, polarization, diffraction, spectrum, reflection, refraction, and more. Teaching tips and lesson ideas for all grade levels!

### 6. IPY STEM Polar Connections: An International Polar Year Curriculum Development Project (part 1 of double session)

Presenter: Rob Snyder UMass Amherst  
Co-Presenter: Mort Sternheim UMass Amherst  
**Colonial** L, E, P, PD El, M, H, I

IPY STEM Polar Connections is an NSF funded teacher professional development project focusing on the latest developments in polar research. This workshop will present a variety of activities and provide resources for classroom use.

### 7. A Closer Look: Ocean Science and Literacy

Presenter: Jayshree Oberoi MAST board/New England Aquarium  
Co-Presenter: Nicole Scola  
**Federal 1** Marine, Literacy El, M, I, G

Learn to connect science skills such as inquiry, observations and investigations with literacy skills such as reading and writing through the use of biofacts and magnification tools for observations.

### 8. Force and Motion Labs: Small in Size Yet Designed to Maximize!

Presenter: Steve Fielman NY State Science Teacher Assoc.  
Co-Presenter: Fred Pidgeon NY State Science Teacher Assoc.  
**Federal 2** P M

Want to really have your students grasp Newton’s Laws of Motion? You will be able to try a set of station labs that require very few materials yet they yield the type of Mastery Learning we all look for in our hands on activities!

**Note: The “Marine Strand” comprises sessions 7, 18, 29, 35, 51, 60, 68, and 73**

## 9. NEED PROJECT – Forms of Energy and Energy Transformations

Presenter: Andy Morris National Energy Education Development

**Boxwood** P El, M, H

NEED Energy activities for grades K–12. Use NEED's *Science of Energy Kit* to explore the forms of energy. NEED materials are correlated to the Massachusetts state standards. Activities, curriculum materials, readings, projects, and games will help students learn about the science of energy.

## 10. Exploring Multimedia Classroom Resources with Harvard Life Sciences Outreach

Presenter: Susan Johnson Harvard Life Sciences/ HHMI Outreach Program

Co-Presenter: Tara Bennett, Program Manager

**Fern** L H

Harvard University's Life Sciences – HHMI Outreach Program website is a rich educational resource for high school biology teachers. Explore online lessons, teacher-authored animations and streaming faculty lectures on a variety of topics.

## 11. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members

**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of "Gee whiz!" experiments you can use in your classroom.

## MAST SESSION 2

9:15 am to 10:15 am

## 12. Project Based Inquiry: Hands-on STEM Activities for Middle School

Presenter: Connie Anick Its About Time Herff Jones Educational Division

Co-Presenter: Martha Katechis It's About Time, Herff Jones Educational Division

**Board** E, L M

Learn how students investigate science content and learn science practices as they address project challenges and answer questions about the world around them.

## 13. The Particulate Nature of Matter: Chemical Interactions for Middle Schools (Part 2 of double session)

Presenter: Kathi Brown Delta Education

**Cotillion** P M

Participants will engage in hands-on/minds-on activities that develop an understanding of matter as particles. Find out how this foundation can and will be use to build other essential chemistry concepts such as kinetic energy. Handouts, materials and books for the first 25 participants.

## 14. FDE/NSA Science and Our Food Supply (Part 2 of double session)

Presenter: Janine Chuckran Bridgewater-Raynham School District

Co-Presenter: Dr. Dave Chuckran SEMASS

**Deck** L M, H

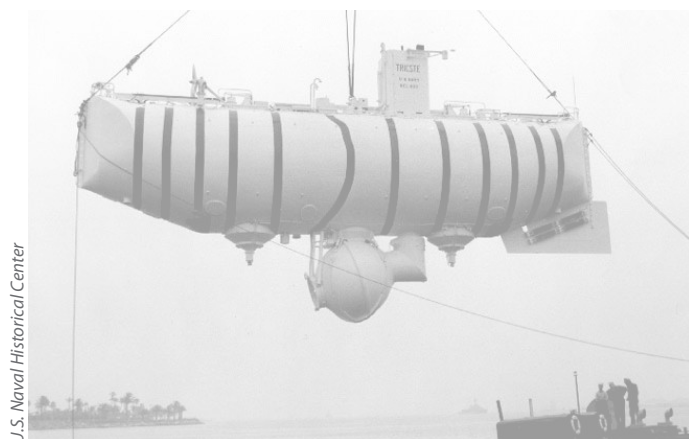
Session will include discussion and demonstrations on safe food practices, such as critical temperatures to kill pathogens, and contamination simulations. Participants will receive a take-home FDA kit including a CD, video, lab materials, and binder.

## 15. Robotics (Part 2 of double session)

Presenter: Gary Garber Boston University Academy

**Director** P, T M, H

Participants will build a functioning remote control robot from a VEX robotics kit. Participants will be introduced to the tools they need to start a robotics program at their school and have their students enter robotics competitions.



U.S. Naval Historical Center

# THURSDAY

## 16. Standards Assessed Middle School

Presenter: Stacy Militello Oak Middle School, Shrewsbury  
Co-Presenter: Pam Poitras

**Seminar Room** Assessment M

Imagine teaching science and not giving grades of A–B–C; assignments are not marked with percentages; instead every assessment is based on a science learning standard. At Oak Middle School in Shrewsbury students' reporting tools show student understanding of learning goals each term. Find out about teaching science in a purely standards based school.

## 17. IPY STEM Polar Connections: An International Polar Year Curriculum Development Project (part 2 of double session)

Presenter: Rob Snyder UMass Amherst  
Co-Presenter: Mort Sternheim UMass Amherst  
**Colonial** L, E, P, PD El, M, H, I

IPY STEM Polar Connections is an NSF funded teacher professional development project focusing on the latest developments in polar research. This workshop will present a variety of activities and provide resources for classroom use.

## 18. Earth as a System is Essential: Seasons and the Seas

Presenter: Joyce Tugel Maine Math & Science Alliance  
Co-Presenter: Ginger Winslow  
**Federal 1** Marine, L, E, P M

This session will share lessons that support student thinking in Earth, life and physical science. See how this NOAA funded project has helped teachers develop a system approach to teaching.

## 19. Habitat Net Project for Teachers

Presented: Dan Bisaccio Brown University  
**Federal 2** L, E, T M, H, Ad, I

The goal of Habitat Net is to enable teachers and students to establish permanent biodiversity monitoring projects around the globe and to communicate about investigations, findings, and questions regarding biodiversity issues and management.

## 20. Exploring Multimedia Classroom Resources with Harvard Life Sciences Outreach (repeat of session 10)

Presenter: Susan Johnson Harvard Life Sciences/HHMI Outreach Program  
Co-Presenter: Tara Bennett, Program Manager  
**Fern** L H

Harvard University's Life Sciences – HHMI Outreach Program website is a rich educational resource for high

school biology teachers. Explore online lessons, teacher-authored animations and streaming faculty lectures on a variety of topics.

## 21. NSTA Resources and Opportunities for Teachers

Presenter: Marilyn Richardson NSTA District One Director  
Co-Presenter: Ed Rock Associative Executive Director of NSTA  
**Ivy** All All

Find out about all of the resources that NSTA has available to teachers at all grade levels. Many of these resources are FREE or very inexpensive. For example, did you know about NSTA's Science Objects, on-line live interactive content modules, or NSTA's Live Interactive Web Seminars? They are both FREE to everyone.

## 22. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members  
**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of "Gee whiz!" experiments you can use in your classroom.

10:15 – 10:45 am

### *Exhibit Hall Grand Opening*

Browse the many exhibits and enjoy a mid-morning coffee break in the Exhibit Hall. Sponsored by School Specialty.

## MAST SESSION 3

10:45 – 11:45 am

## 23. National Library of Medicine Resources for Science Teachers

Presenter: Michelle Eberle National Library of Medicine/  
UMass  
**Board** L El, M, H, Ad, I, G

The National Library of Medicine provides free online resources for biology, genetics, careers and health. Get a guided tour of NLM resources including profiles in science, genetic home reference, medllzeplus, chemioplus, toxtown, toxmap and pubmed.

## 24. When You Do Hands-on Science: How Do You Know They are Getting It?

Presenter: Steve Murray      Delta Education  
**Cotillion**      Assessment & Inquiry      El

We will show how the new FOSS benchmark assessments provide summative information and achievement data that can be used for grading and accountability, and to improve students' readiness for state wide testing. Benchmark assessments also provide self assessment techniques for the students.

## 25. The Chemical Formula

Presenter: Deborah Carlisle      Lab Aids – Natural Chemistry  
**Deck**      P      H

The chemical formula is elusive to many students, which leads to misconceptions. This workshop will use concrete activities, with molecular models, that will build a solid understanding of the chemical formula. Specifically these activities will show students what the subscript numbers represent, and how they are related to molecular structure. We will also connect the chemical formula to balanced equations.

## 26. Fostering Student Ownership to Increase Student Achievement

Presenter: Charles Luey      Pearson Higher Education  
**Director**      L, E, P      El, M, H

Finding ways to increase student achievement is at the heart of almost everything good educators do. Put simply, engaged students are much more likely to perform at higher levels than unengaged students. Learn more about what Pearson is doing to foster student engagement and ownership in the middle grades science classroom.

## 27. Science Enrichment Programs That Promote Inquiry

Presenter: Mary Hatton      Endicott College  
 Co-Presenter: Joan Sullivan      Family Youth and Science  
**Seminar Room**      L, P, PD      El, I

Learn how we've developed successful informal science learning experiences aligned with frameworks (after school enrichment family math/science nights). Our programs encourage children to explore, make their own discoveries and solve problems.

## 28. Hands-on Human Body Systems

Presenter: Doug Cortese      Hands and Minds.com  
**Colonial**      L, PD      H

Here is a hands-on approach to biology, life science, and anatomy education. Participants will build muscles and organs in clay and attach them to skeletal models. See how learning about the cardiovascular, nervous, and muscular system can be easy and fun for you and your students.

## 29. Climate Change and the Oceans

Presenter: Nicole Scola      New England Aquarium  
 Co-Presenter: Jayshree Oberoi      MAST Board/New England Aquarium  
**Federal 1**      Marine, L E, P      M, H, Ad, I, G

The oceans have a central role in protecting the earth. Ocean acidification, rising sea levels, and melting ice caps are endangering our planet. Explore ways to teach the science of climate change and the challenges that the oceans face.

## 30. Marble Launcher

Presenter: Fred Pidgeon      NY State Science Teachers Association  
 Co-Presenter: Steve Fielman      NY State Science Teachers Association  
**Federal 2**      P, T      M, H

Attendees will use the marble launcher to determine projectile motion. Add the excitement of building to your class.

## 31. NEED PROJECT – Saving Energy at Home and School

Presenter: Andy Morris      National Energy Education Development  
**Boxwood**      P      El, M, H

NEED Energy activities for grades K–12. Use NEED's Science of Energy Kit to explore the forms of energy. NEED materials are correlated to the Massachusetts state standards. Activities, curriculum materials, readings, projects, and games will help students learn about the science of energy.

## 32. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members  
**Summer**      E, L, P, T      El, M, H, Ad, I

Try out a variety of "Gee whiz!" experiments you can use in your classroom.

# THURSDAY

11:45 – 12:15 pm

**Dedicated Exhibit Hall Time**

12:15 – 1:00 pm

**Luncheon in Courtyard (ticketed)**

## MAST SESSION 4

1:00 – 2:00 pm

### 33. Foldable Fun (Part 1 of double session)

Presenter: Ellen Lantz Herberg Middle School

Co-Presenter: Brenda Burbank

Herberg Middle School

**Board** E, L, P El, M, H, Ad, I

Instructions for making foldables that can be adapted and used with any curriculum. Used for daily work, note-taking, student-directed projects, science labs, journals observations, graphs, tables, forms of alternative assessments, and MORE! Will show you how that can be used in other subject areas.

### 34. Music, Humor and Atomic Structure

Presenter: Warren Phillips Plymouth Community

Intermediate School

**Cotillion** P El, M, H, G

Using brain based strategies to teach atomic structure. We will use music, humor, manipulative, movement, visualization and much more to drive home concepts of atomic structure.

### 35. Ocean Currents and Circulation

Presenter: Michael Romano Acton-Boxboro Regional HS

**Deck** Marine, L, E, P M, H

Together we will explore wind-driven ocean currents and deep-ocean circulation through hands-on activities from the Maury Project. Participants will leave with standards-based labs and activities for use in their classrooms.

### 36. Sketchbook Naturalists (part 1 of a double session)

Presenter: Wendy Holzer Harvard Museum of Natural History

**Director** L El, M

Study the adaptations that animals use to survive through careful observations and sketches of museum specimens. Learn how to try sketching in your classroom. No prior drawing experience required.

### 37. CITYSTEM: Community Involvement – Teachers, Youth in STEM Education

Presenter: Lanie Higgins NSTA Goldin Foundation Award

**Seminar Room** E, L, P El, M

Learn about the development of a successful after school/summer science enrichment program. Discussion will include the mission, procedure, staffing, activities and resources. A step-by-step guide will be provided.

### 38. Teaching MS Chemistry Concepts for HS Biology Concepts (Part 1 of double session)

Presenter: Kathy Vandiver MIT Edgerton Center

Co-Presenters: Amanda Gruhl, Amy Fitzgerald, Jessica Garrett

**Colonial** E, L, P M, H

Two key MS chemistry concepts (chemical reactions part one and photosynthesis part two) will be taught using examples and simple LEGO bricks to visualize the atoms in the processes. Complete classroom sets of materials will be raffled off to three workshop attendees in each workshop.

### 39. One in One Million

Presenter: Deborah Carlisle Lab Aids – Natural Chemistry

**Federal 1** E, L, P M, H

We will explore measuring dilute concentrations with an RGB spectrophotometer. We will gather data and graph our results with specially designed graph paper. This lab is designed to show students what one part per million actually is, and why small amounts actually matter. These applications are important in environmental applications as well as everyday life.

### 40. Stem Cells and Bioethics: Bringing the Cutting Edge of Science to Your Classroom

Presenter: Maria Borowski UMass Medical School/ Center for

Stem Cell Biology

Co-Presenter: Kim Sterrel

**Federal 2** L M, H

This presentation by the Center for Stem Cell Biology at UMass will discuss some of the hot topics in research and how you can help your students become knowledgeable science consumers.

## 41. MIT BLOSSOMS Initiative

**Presenter:** Richard Larson MIT  
**Boxwood** L, E, P, PD H

The MIT BLOSSOMS Initiative is a large, free on-line repository of interactive learning videos for high school math and science classes. Web site is <http://blossoms.mit.edu>.

## 42. Hands-on Human Body Systems

**Presenter:** Doug Cortese Hands and Minds.com  
**Fern** L, PD H

Here is a hands-on approach to biology, life science, and anatomy education. Participants will build muscles and organs in clay and attach them to skeletal models. See how learning about the cardiovascular, nervous, and muscular system can be easy and fun for you and your students.

## 43. NSTA Resources and Opportunities for Teachers

**Presenter:** Marilyn Richardson NSTA District One Director  
**Co-Presenter:** Ed Rock Associative Executive Director of NSTA  
**Ivy** All All

Find out about all of the resources that NSTA has available to teachers at all grade levels. Many of these resources are FREE or very inexpensive. For example, did you know about NSTA's Science Objects, on-line live interactive content modules, or NSTA's Live Interactive Web Seminars? They are both FREE to everyone.

## 44. Science - Voyage of Discovery Stations - All Day

**Presenters:** MAST members  
**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of "Gee whiz!" experiments you can use in your classroom.

# MAST SESSION 5

2:15 – 3:15 pm

## 45. Foldable Fun (Part 2 of double session)

**Presenter:** Ellen Lantz Herberg Middle School  
**Co-Presenter:** Brenda Burbank Herberg Middle School  
**Board** E, L, P El, M, H, Ad, I

Instructions for making foldables that can be adapted and used with any curriculum. Used for daily work, note-taking, student-directed projects, science labs, journals observations, graphs, tables, forms of alternative assessments, and MORE! Will show you how that can be used in other subject areas.

## 46. The Science of Readers Theater

**Presenter:** Melissa Stewart Author of science books for children  
**Cotillion** E, L, P, PD El, M, Ad, I

Build your students' fluency and teach science concepts by adapting science-themed picture books into fun Readers Theater scripts for your class to practice and perform.

## 47. Helping Students "Visualize" Polar Dynamics

**Presenter:** Carol Mutchler Wilmington HS  
**Deck** E El, M, H, Ad, I

This workshop is designed to give teachers some simple activities to help students better understand the dynamics of the polar regions. This is suitable for all levels. Activities aimed at helping students "see" what is going on.

## 48. Sketchbook Naturalists (part 2 of a double session)

**Presenter:** Wendy Holzer Harvard Museum of Natural History  
**Director** L El, M

Study the adaptations that animals use to survive through careful observations and sketches of museum specimens. Learn how to try sketching in your classroom. No prior drawing experience required.

## 49. The Next Steps to Improving Stem Education in Massachusetts

**Presenter:** Margaret Riley President, MA Academy of Sciences  
**Seminar Room** PD El, M, H, Ad, I

The Massachusetts Academy of Science (MAS) sponsored a forum on science technology, engineering and mathematics (STEM) education to identify a set of priorities in STEM education reform in the Commonwealth. The focus of this presentation is a description of the recommendations and meeting report, which is available on line.

## 50. Teaching MS Chemistry Concepts for HS Biology Concepts (Part 2 of double session)

**Presenter:** Kathy Vandiver MIT Edgerton Center  
**Co-Presenters:** Amanda Gruhl, Amy Fitzgerald, Jessica Garrett  
**Colonial** E, L, P M, H

Two key MS chemistry concepts (chemical reactions part one and photosynthesis part two) will be taught using examples and simple LEGO bricks to visualize the atoms in the processes. Complete classroom sets of materials will be raffled off to three workshop attendees in each workshop.

## 51. Modeling of the Seafloor: A 3-D Model

**Presenter:** Tom Vaughn Northeastern University  
**Federal 1** Marine, E

Student understanding of seafloor features can be enhanced by the construction of a 3-D model of the ocean floor

# THURSDAY

and by the viewing of a free streaming video available to teachers and students on the Internet

## 52. Three Steps to Sustaining Student Learning in Science

Presenter: William Rigney, MA State Science and Engineering Fair

Co-Presenter Cora Beth Abel, MSSEF

**Federal 2** PD M, H

Learn about the three steps, and experience a sample activity from the graduate level course, *“Teaching Science through the Inquiry Process”* (TSIP). Participants explore a hands-on TSIP activity, gain an overview of the curriculum, and review data and plans for statewide scale-up.

## 53. MIT BLOSSOMS Initiative

Presenter: Richard Larson MIT

**Boxwood** L, E, P, PD H

The MIT BLOSSOMS Initiative is a large, free on-line repository of interactive learning videos for high school math and science classes. Web site is <http://blossoms.mit.edu>.

## 54. Green School

Presenter: Robert McGillicuddy Elaine Adams Awardee 2008

Co-Presenter: Gina Joyce Elaine Adams Awardee 2008

**Fern** L, E M

Sterling Middle School in Quincy, MA is a Green School. Hear about our projects including recycling, composting, clean air, single stream recycling, St Maritz field guide, and styrofoam awareness

## 55. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members

**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of “Gee whiz!” experiments you can use in your classroom.



**Exhibits**  
**Prizes**  
**Food**

*There will be a drawing for great prizes including a gift certificate from Delta, a Crazy Traits genetics kit from CPO, and a microscope from Frey.*

**Thursday 3:15 to 4:00 PM**

**Special Exhibit Hall Time**

# THURSDAY

## Later Events

3:15 – 4:00 pm

Special Exhibit Hall Time

Browse Exhibits. Sign up for DOOR PRIZES.

4:00 – 4:30 pm

MSELA Meeting in Directors Room

4:00 – 4:30 pm

MAST Annual Meeting in Cotillion Room

5:00 pm

Banquet Reception in Courtyard (ticketed)

Sponsored by Prentice-Hall

## MAST/MSELA Awards Banquet

Courtyard 6:00 pm

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Massachusetts Finalists for Presidential Awards

Dawn Sather Outstanding New Science Teacher Award  
Massachusetts State and County Science Educator Awards  
Russell Stanhope Distinguished Friend of Science Award  
Outstanding Biology Teacher Award

2009 Outstanding Principal's Awards  
2009 Outstanding Science Educator's Awards

***This is a ticketed event***

## MSELA Leadership Sessions

### MSELA SESSION 1

Friday 8:00 – 9:30 am

#### BOARD Room

##### Green Chemistry - What Every Science Leader Needs to Know

Presenter: Amy Cannon      Co-Founder & Executive  
Director of Beyond Benign, a Warner Babcock  
Foundation

#### SEMINAR Room

##### TIMSS

Presenter: Katie Bowler      Mass Dept of Elementary  
and Secondary Education  
Co-Presenter: Sal Beatini

**Katie Bowler** is the Administrator for Science and Technology/Engineering Test Development at the Department of Elementary and Secondary Education (formerly the DOE). She has been at the Department since 2001. Before working in the Assessment Unit, Katie worked in the Office for Math, Science and Tech/Eng where she managed various grant programs and curriculum framework revisions. **Sal Beatini** has worked at the Department of Elementary and Secondary Education since 2004. His main responsibilities are the development of the Biology and Chemistry MCAS tests, however he works on all of the science and tech/eng MCAS tests.

## MSELA Leadership Sessions

### MSELA SESSION 2

Friday 10:00 – 11:30 am

#### BOARD Room

##### MSELA Open Forum

Presenter: The Executive Board of MSELA

The board will be present to facilitate discussion and answer questions. All science leaders are encouraged to attend to share thoughts, offer suggestions, and network with others as we strive to provide continuing support throughout the State.

#### SEMINAR Room

##### Revisions of the MA Science & Technology/ Engineering Framework- Updates

Co-Presenter: Jennifer Craddock, Newton Public Schools

Co-Presenter: Mette Schwartz, Medway Public Schools

Co-Presenters: Joyce Bowen and Jacob Foster

MA Department of Elementary and Secondary Education

The state's Science & Technology/Engineering Framework is undergoing a full revision (PreK-12) during the '09-'11 school years. The Review Panel is just completing phase 1 of this work, articulating suggestions for broad changes to the Framework. These include suggestions for changes to format, content topics, skills, and other changes. Please join us as we share our current thinking and request input from teachers across the state about these suggestions before they are presented to the Board of Education.

**Joyce Bowen** and **Jake Foster** are with the Office for Mathematics, Science, and Technology/Engineering (MSTE). Their office is responsible for writing and updating curriculum frameworks in mathematics, science, and technology/engineering. They manage related initiatives in curriculum and instruction, such as professional development, content institutes, mathematics and science partnerships, and advisory councils. In addition, the office is responsible for registering professional development providers.

12:15 – 1:15 pm

Lunch in Courtyard (ticketed)

## MSELA Leadership Sessions

### MSELA SESSION 3

Friday 1:00 – 2:30 pm

#### BOARD Room

##### Improving Safety, Reducing Risk and Saving Money

Presenter: Dwight Peavey, PhD  
Senior Scientist, US EPA

Recently, NSTA stated safety in K-12 school science instruction needs immediate and significant attention. Massachusetts' public schools are not required to have a safety or chemical hygiene program and are not subject to OSHA's laws and regulations. Science teachers have a professional obligation to do no harm to our students and children. Over the past years, old and new schools have moved, stored or forgotten about hundreds of pounds of toxic and hazardous chemicals. No one individual is the gatekeeper for our chemical resources. This session will discuss how several school systems have partnered with the US EPA to implement an integrated chemical management program. Under this voluntary and free partnership, EPA provides a team to collect, identify, segregate and consolidate old, unwanted chemicals. The team assists the school in the creation of a real time chemical inventory and a secured, controlled storage area. All mercury containing devices are centrally collected for removal. The team also provides teacher training on safety, waste management, green chemistry and pollution prevention.

#### SEMINAR Room

##### STE Science and Technology/Engineering MCAS

Presenter: Katie Bowler      Mass Dept of Elementary  
and Secondary Education  
Co-Presenter: Sal Beatini

**Katie Bowler** is the Administrator for Science and Technology/Engineering Test Development at the Department of Elementary and Secondary Education (formerly the DOE). She has been at the Department since 2001. Before working in the Assessment Unit, Katie worked in the Office for Math, Science and Tech/Eng where she managed various grant programs and curriculum framework revisions. **Sal Beatini** has worked at the Department of Elementary and Secondary Education since 2004. His main responsibilities are the development of the Biology and Chemistry MCAS tests, however he works on all of the science and tech/eng MCAS tests.

# FRIDAY

Science Discipline Key: (L) Life Science, (E) Earth, (P) Physical, (Prof Dev) Prof. Development, (Tech) Technology.  
Target Group Key: (El) Elementary, (M) Middle, (H) High School, (Adult Ed) Adult Education, (G) General

## MAST Friday Highlights

**7:00 – 12:00 noon**

Registration in Exhibit Hall

**7:00 – 8:30 am**

Complimentary Continental Breakfast in Exhibit Hall

**9:30 – 10:00 am**

Dedicated Exhibit Hall Time  
Mid-morning coffee break

**11:30 – 12:00 pm**

Dedicated Exhibit Hall Time

**12:00 – 12:45 pm**

Lunch in Courtyard (ticketed)

**2:30 pm**

MAST Merriment in Exhibit Hall  
Refreshments and Door Prizes!

## MAST SESSION 1

**8:00 – 9:30 am**

### 56. Visual and Hands-on Learning

Presenter: Michael Berkowitz K8 Resources

**Cotillion** L, E, P G

Would you like to use more high-quality visuals, hands-on activities and learning kits? Learn how to create your own.

### 57. Energize Your Students with Inquiry-based Water and Energy Investigations

Presenter: Sandra Ryack-Bell Museum Institutes for Teaching Science

Co-Presenters: Amy Hoffmaster, Jane Heinze-Fry

**Deck** E, L, P El, M

Participate in inquiry-based, minds-on, hands-on, water and energy activities developed by K–8 teachers during MITS summer institutes involving 45 museums, aquaria and science education centers. MITS offers a unique graduate level model of professional development for teachers.

### 58. Make Plant and Animal Cells Models with Fun and Edible Materials

Presenter: Mary Chmielecki Qualters Middle School, Marshfield

Co-Presenter: Lauren Penta

**Director** L M

We intend to have participants make and evaluate two different cell models: Cell cakes (with frosting), Cell jewelry with shrinky-dink paper and different jewelry attachments.

### 59. Worm Composting for the Classroom

Presenter: Ann McGovern MA Department of Environmental Protection

**Colonial** L, El El, M, H, G

Set up a classroom worm bin or an outdoor compost bin to teach Life Science Learning Standard 11, “Energy and Living Things.” Bring a 14-gallon or larger plastic tote if you wish to make your own worm bin; worms provided! Great tie-in with school gardening projects. Learn how to obtain outdoor compost bins through DEP’s Green Team program.

### 60. 3D Underwater World

Presenter: Ed Jameson Christa McAuliffe Center, Framingham St. College

**Federal 1** Marine, L, T El, M, H, Ad, I

Experience a dramatic guided tour of coral reef life in 3 dimensions! Learn how to make and show 3D images and what it takes to work under water.

**Note: The “Marine Strand” comprises sessions 7, 18, 29, 35, 51, 60, 68, and 73**

## 61. Science Notebooks Provides Sense Making to Hands-on Science

Presenter: Steve Murray Delta Education  
**Federal 2** P El, M, H

In this hands-on workshop participants will use materials from the FOSS program to show how notebooks help student with the sense making part of Hands-on Science. Participants will use notebooks to construct concepts and build explanations

## 61b. MCAS Review Can Be Fun! (repeated at 1:00)

Presenter: Christina Bash Salem State College  
 Co-Presenter: Teegan von Burn  
**Boxwood** L, E, P, MCAS review M, H

In preparation for MCAS, help students reactivate and review concepts based on State Frameworks by using a variety of learning styles and passport type booklet, students will visit sites in an interactive “science fair” type atmosphere. This could be a one day extravaganza or presented over a series of classroom periods.

## 62. Bring Your Science Classroom Into the 21<sup>st</sup> Century

Presenter: Lara Sharp PASCO Scientific  
 Co-Presenter: Renee Most PASCO Scientific  
**Fern** L, E, P El, M, H

Experience 21<sup>st</sup> century hands on, minds on science education through technology. You will interact with PASCO’s new color touch screen SPARK science learning system. Find out how PASCO provides simple, convenient, reliable, and complete solutions for science education.

## 63. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members  
**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of “Gee whiz!” experiments you can use in your classroom.



9:30 – 10:00 pm

## *Dedicated Exhibit Hall Time*

**Browse the exhibits and enjoy a coffee break.**

## MAST SESSION 2

10:00 – 11:30 am

## 64. Using the Design Process in Anatomy and Physiology

Presenter: Catherine McCahill Hopkinton HS  
**Cotillion** L H

The principal of analytical design can be used to help students build their own understanding. A lesson building models will demonstrate how students can analyze data to determine the characteristics of epithelial tissue.

## 65. Electrochemical Cells and the Battery

Presenter: Deborah Carlisle Lab Aids  
**Deck** P M, H

We will explore the relationship between electrons, electricity, and chemistry. How do chemicals store energy? Each group will make a lemon battery and then apply those concepts to a real galvanic cell. The voltage will be measured using a voltmeter and this will allow for a deeper investigation of how a battery actually works. Each group will experiment with the various parts of the cell. We will observe and discuss how batteries get energy from chemicals. Related chemical reactions and how rechargeable batteries work will also be topics of discussion.

## 66. Force and Motion Labs: Small in Size Yet Designed to Maximize!

Presenter: Steve Fielman NY State Science Teachers Association  
 Co-Presenter Fred Pidgeon NY State Science Teachers Association  
**Director** P M

Want to really have your students grasp Newton’s Laws of Motion? You will be able to try a set of station labs that require very few materials yet they yield the type of Mastery Learning we all look for in our hands on activities!

## 67. Science Notebooks the Key to Investigative Questions

Presenter: Mary Rizzuto Needham Science Center  
 Co-Presenter Kelly Corbett  
**Colonial** P El

Experience the inquiry model, experiment with electricity, and discover how the use of science notebooks can inspire independent student investigations in an elementary classroom.

## 68. Teachers on the Estuary

Presenter: Joan Muller Waquoit Bay National Estuarine Research Reserve  
 Co-Presenter Stephanie Scherr Narragansett RHS  
**Federal 1** Marine, E H

We will introduce *Teachers on the Estuary*, a grant-funded professional development workshop where teachers can learn about estuaries and coastal science. We'll share information about field studies and stewardship projects and try out activities from the Estuaries 101 online curriculum.

## 69. Who Infected Whom?

Presenter: Lavelle Ruggerio SEPUP/ Lab Aids  
**Federal 2** L M, H

In this simulation, students play the role of the epidemiologist to track and stop the spread of a mysterious epidemic affecting the Abingdon High School population. Then they test their hypothesis in a hands on lab and make a decision.

## 70. Bringing Vision into the Classroom

Presenter: Dr. Ishara Mills-Henry MIT, MABT  
 Co-Presenter: Dr. Jonathan King MIT  
**Boxwood** L M, H

This workshop, part of an NIH outreach program, will focus on human eye anatomy with emphasis on color vision. A part of the workshop will include a cow eye dissection and a discussion about the molecular basis of human eye diseases. Worksheets and laboratory activities on how to include these topics in the classroom will be available.

## 71. Bring Your Science Classroom into the 21<sup>st</sup> Century

Presenter: Lara Sharp PASCO Scientific  
 Co-Presenter: Renee Most PASCO Scientific  
**Fern** L, E, P El, M, H

Experience 21<sup>st</sup> century hands on, minds on science education through technology. You will interact with PASCO's new color touch screen SPARK science learning system. Find out how PASCO provides simple, convenient, reliable, and complete solutions for science education.

## 72. Science – Voyage of Discovery Stations – All Day

Presenters: MAST members  
**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of “Gee whiz!” experiments you can use in your classroom.

11:30 – 12:00 pm

**Exhibit Hall Time**

Last chance to visit exhibits

12:00 – 12:45 pm

Lunch in Courtyard (ticketed)

## MAST SESSION 3

1:00 – 2:30 pm

## 73. Squid Dissection

Presenter: Laura Katz Needham Science Center  
 Co-Presenter Judy Campbell  
**Cotillion** Marine, L El

Participants will dissect this fascinating, marine invertebrate, an activity perfect for your 4-6<sup>th</sup> grade students. Presenters will review dissection tools, techniques, squid classification and adaptations.

## 74. Science and Ecology: Live & Unplugged! A Cumulative and Sequential Environmental Education Program Collaboration

Presenter: Drew Dumsch Ferry Beach Ecology School  
**Deck** L, E El, M, I

Learn about “SELU”, a place-based learning collaborative addressing environmental literacy. Workshop time will include hands-on activities and address how to include and fund environmental literacy programs in your school-year curriculum.

## 75. Energy Car and Timer

Presenter: Fred Pidgeon NY State Science Teachers Association  
Co-Presenter: Steve Fielman NY State Science Teachers Association

**Director** P, T M, H

All attendees will use the timer and energy car to discover velocity, acceleration and momentum collisions. (Max of 20).

## 76. Mineral Formation: A Food Analogy

Presenter: Mark Greenman NSF Einstein Fellow/ Marblehead HS

**Colonial** E El, M

Your students work as mineralogist creating in their laboratory the conditions for the formation of common minerals. In this hands-on activity, students will use flour, cocoa, baking soda, sugar, salt, and brown sugar as ions to form Quartz, Feldspar, Olivine, Hornblende, Corundum, and Hematite.

## 77. Demystifying Science Education in the Department of Youth Services

Presenter: Kathy Rho Commonwealth Corporation

**Federal 1** L, P, PD M, H, G

The Massachusetts Dept of Youth Services (DYS) developed a science instructional guide aligned with the frameworks for biology, chemistry and physics, as well as with the National Science standards. Learn how you can use this tool guide in you classroom

## 78. Science and Literacy

Presenter: Kathi Brown Delta Education

**Federal 2** E, L, P El, M

Learn techniques and ideas to utilize in your classroom to help students develop science concepts as well as increase their writing, recording and reading skills. Great for Elementary through Middle school level. Handouts, some materials and readings will be provided to the first 20 participants.

## 78b. MCAS Review Can Be Fun! (repeat of 8:00)

Presenter: Christina Bash Salem State College

Co-Presenter: Teegan von Burn

**Boxwood** L, E, P, MCAS review M, H

In preparation for MCAS, help students reactivate and review concepts based on State Frameworks by using a variety of learning styles and passport type booklet, students will visit sites in an interactive "science fair" type atmosphere. This could be a one day extravaganza or presented over a series of classroom periods.

## 79. NSTA Resources and Opportunities for Teachers

Presenter: Marilyn Richardson NSTA District One Director

**Fern** All All

Find out about all of the resources that NSTA has available to teachers at all grade levels. Many of these resources are FREE or very inexpensive. For example, did you know about NSTA's Science Objects, on-line live interactive content modules, or NSTA's Live Interactive Web Seminars? They are both FREE to everyone.

## 80. Science - Voyage of Discovery Stations - All Day

Presenters: MAST members

**Summer** E, L, P, T El, M, H, Ad, I

Try out a variety of "Gee whiz!" experiments you can use in your classroom.

2:30 pm

**MAST Merriment**  
**Refreshments and Door Prizes**



HMS Beagle in the Galapagos by John Chancellor

# NOTES

**Thursday  
8:00 am**

**Thursday  
9:15 am**

10:15 - 10:45 AM Exhibit Hall Grand Opening

**Thursday  
10:45 am**

11:45 - 12:15 PM Dedicated Exhibit Hall Time

**Thursday  
1:00 pm**

**Thursday  
2:15 pm**

3:15 - 4:00 PM Special Exhibit Hall Time  
4:00 PM Annual Meeting  
5:00 PM Reception  
6:00 PM Awards Banquet (ticketed)

**Friday  
8:00 am**

9:30 - 10:00 AM Dedicated Exhibit Hall Time

**Friday  
10:00 am**

11:30 - 12:00 PM Dedicated Exhibit Hall Time

**Friday  
1:00 pm**

1:00 PM Exhibit Hall Closes  
2:30 PM MAST Merriment

# PD POINTS RECORD

**Attendees:** MAST is a registered Professional Development provider. Using this form, you can maintain a record of the Professional Development Points you accrue while at the MAST Conference. Complete it by listing the title of the session you attended in the appropriate time slot. **As you leave each day**, you may have the form officially stamped at the registration desk and receive an PDP form. The program and form serve as your record of attendance. You will need to combine these PDP hours with other PDP opportunities to complete a 10-hour requirement. Arrange with your school for these additional hours and any product that you will create.

## Thursday, October 22, MAST Content Sessions

Session	Title	Presenter
8:00 - 9:00		
9:15 - 10:15		
10:45 - 11:45		
1:00 - 2:00		
2:15 - 3:15		

## Friday, October 23, MSELA Leadership Sessions

Session	Title	Presenter
8:00 - 9:30		
10:00 - 11:30		
1:00 - 2:30		

## Friday, October 23, MAST Content Sessions

Session	Title	Presenter
8:00 - 9:30		
10:00 - 11:30		
1:00 - 2:30		

MEETING ROOM FLOOR PLAN

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