

MISSION STATEMENT:

The Science Department of the Boston Public Schools strives to:

- Improve student achievement in science to prepare all children for a successful future;
- Support teachers as they provide rigorous, high quality science courses for all students; and
- Provide equitable support for all schools throughout the district.



Table of Contents

SECTION 1: INTRODUCTION

- ❑ Science Department Mission Statement 1
- ❑ Science Staff & Contact Information 3

SECTION 2: CURRICULUM: SCOPE & SEQUENCE: PACING GUIDES

- ❑ Curriculum Matrix: Scope and Sequence 4
- ❑ District Time Guidelines 5
- ❑ Pacing and Instructional Guides 5
- ❑ Elementary Literature Connections 5
- ❑ Curriculum Implementation Reviews 6
- ❑ Science and the New Standards 6
- ❑ Science Materials and Ordering 6-11

SECTION 3: SCIENCE ASSESSMENT PROGRAM

- ❑ Classroom Level Assessments and Notebooks 12
- ❑ District Level Assessments 12-13
- ❑ State & National Level Assessments 13-15
 - MCAS Science and Technology/Engineering (STE) Testing Schedule
 - AP Science Exam Schedule

SECTION 4: PROFESSIONAL DEVELOPMENT

- ❑ Elementary, Middle & High School 16-17
- ❑ New Teacher and Teacher Leader Professional Development 17-18

SECTION 5: KEY DATES

- ❑ Science District Assessment and PD (See MLP) 18

SECTION 6: AVAILABLE RESOURCES

- ❑ Web & Print Resources 19-20
- ❑ Science Socials Schedule 21
- ❑ A Letter for Families 22-23

SECTION 7: MAJOR GRANTS AND SPECIAL PROJECTS

- ❑ BEST, SEF, After School Science Program, and Science Fair 24



BOSTON PUBLIC SCHOOLS

DEPARTMENT OF SCIENCE

PAMELA M. PELLETIER
SENIOR PROGRAM DIRECTOR

Science Staff & Contact Information

Senior Program Director	Pam Pelletier		
Elementary Science Professional Development and Instructional Materials Specialist	Bev Nadeau		
Elementary and Middle School Science Professional Development Specialist	Dean Martin		
Secondary Science Professional Development Specialists	Jonathan McLaughlin Suzanne Gill		
Science Materials Technicians	Dorothy Fitzgerald Paulette Emile-Hunter Nghia Phan		
Department Support Volunteer	Vacant-Know anyone?		
Questions About...	Contact	Email	Phone
Science Department and Professional Development, Instructional Practice and Supervision, MCAS Issues, Programs, Grants and Proposals, Curriculum Implementation and Support, Assessment, New Teachers, and Science Fair	Pam Pelletier Senior Program Director	ppelletier@boston.k12.ma.us	617-635-8750 617-293-9473 (c)
Elementary science curriculum and instructional materials professional development	Bev Nadeau	bnadeau@boston.k12.ma.us	617-438-2224 (c)
K-8 science curriculum and instructional materials professional development	Dean Martin	dmartin2@boston.k12.ma.us	978-870-5580 (c)
High school science curriculum and instructional materials professional development	Suzanne Gill	sgill@boston.k12.ma.us	617-338-6036 (c)
	Jonathan McLaughlin	jmclaughlin4@boston.k12.ma.us	617-549-8887 (c)
K-12 Science Materials & Elementary After-school Programs	Bev Nadeau	bnadeau@boston.k12.ma.us	617-438-2224 (c)
Science Kit Orders	Bev Nadeau	bnadeau@boston.k12.ma.us	617-635-9800
Workshop Registration		www.MyLearningPlan.com	617-635-8750
Science Fair Program and Forms	Ruth O'Day	rmoday@verizon.net	617-635-8750
	Maryann Benda	naillady@hotmail.com	

Section 2:

Curriculum: Scope & Sequence/Pacing Guides/Materials

In 2001, the Massachusetts Science and Technology Frameworks were changed. In response to these changes the Science Department in collaboration with science teacher leaders selected new science materials for Grades K-11.

Grade	Unit/Course of Study			
K2	Wood and Paper (FOSS)		Animals 2x2 (FOSS)	
1	Solids and Liquids (STC)	Organisms (STC)		Air and Weather (FOSS)
2	New Plants (FOSS)	Pebbles, Sand & Silt (FOSS)		Insects (FOSS)
3	Water (FOSS)	Sound (FOSS)		Structures of Life (FOSS)
4	Motion and Design (STC)	Magnetism & Electricity (FOSS)	Animal Studies (STC)	Rocks and Minerals (BPS Teachers)
5	Levers & Pulleys (FOSS)	Ecosystems (STC)	Landforms (FOSS)	Measuring Time (STC)
Science & Technology MCAS Exam Grade 5				
6	Human Body Systems (STC)		Weather and Water (FOSS)	
7	Diversity of Life (FOSS)	Earth History (FOSS)		Forces and Motion (FOSS)
8	Planetary Science (FOSS)	Populations and Ecosystems (FOSS)		Chemical Interactions (FOSS)
Science & Technology MCAS Exam Grade 8				
9	Active Physics		MCAS offered at grades 9 or 10	
9 or 10	Biology A Human Approach		MCAS offered at grades 9 or 10	
10 or 11	Living By Chemistry		MCAS offered at grades 10 or 11	
9 or 10	Technology/Engineering		MCAS offered at grades 9 or 10	
11 or 12	AP Biology	AP Physics	AP Chemistry	AP Environmental

Note: Students should take the MCAS in high school starting with the course they are enrolled in for grade 9. Schools may choose to implement chemistry in 10th grade followed by biology in 11th. Engineering is not recognized as a science course for post-secondary schools. Very few schools are administering the MCAS Engineering test statewide; DESE no longer releases items for our use. Please contact the science department if you have questions.

Since the Pacing Guides are modified based on schedule changes, that information is posted on the Science page of MyBPS.

District Time Guidelines:

Science MCAS is a graduation requirement that began for the class of 2010. Students are now required to receive a Competency Determination in physics, chemistry, engineering **or** biology. The curriculum instructional materials that have been selected build science concepts from elementary through high school. It is extremely important that **all** schools provide science instruction according to district guidelines.

Grade Level	Time Requirements
Kindergarten - 2	A minimum of 90 minutes of Science Instruction per week
3	A minimum of 135 minutes of Science Instruction per week
4-8	A minimum of 225 minutes of Science Instruction per week
9-12	A minimum of 225 minutes of Science Instruction per week
Advanced Placement	The district has not set guidelines, however the College Board suggests that in addition to district class time, students have at least two additional lab periods each week of 90 minutes each. For detailed information consult http://apcentral.collegeboard.com/courses/descriptions/

Pacing Guides:

Teachers who participate in program/kit professional development will receive pacing guide information during the training. These documents are extremely detailed and will help teachers to complete the entire curriculum at each grade level. Teachers should be encouraged to keep on pace with these suggestions. When in doubt a teacher should follow the recommended timing provided in the teacher's guide that accompanies the instructional materials.

There are pacing guides for the 19 elementary kits, the 8 middle school programs, and the three teacher-selected and district supported high school programs -- Active Physics, Biology: A Human Approach, and Living By Chemistry. Please have teachers find them on MyBPS.

For assistance with how to use the Teacher Guides, please go to—

http://lhsfoss.org/fossweb/teachers/resources/TG_Navigation_guide/TG_Navigation_Guide.html Although this was developed by FOSS for the elementary units, use of these teacher resources are similar for the middle school and for the STC units as well.

Elementary Literature Connections:

The Science Department has assembled a list of trade books that are meant to enhance the elementary science experience. Schools are encouraged to add these selections to classroom libraries. The list is posted on MyBPS and is updated periodically. Additionally, there are resources that align with our K-8 FOSS materials; to run a search: <http://www.fossweb.com/searches/freesearch.php>

Curriculum Implementation Reviews:

Each year the Science Department will conduct curriculum implementation reviews in selected middle and high schools. All science classrooms will be observed and a summary report will be produced. The goal of the CIR is to help teachers improve their practice and to follow the district curriculum more closely. The observation form for a CIR is posted on the science page of MyBPS. Please contact Pam Pelletier if you would like to schedule a CIR for your school.

Science and the New Standards:

The Next Generation of Science Standards and revised MA Science Frameworks are in development by Achieve, Inc. and The MA DESE. The Science Department is working closely with the State to shape the new frameworks. We are also piloting and field testing materials so that when the standards are released we will be poised to realign our units and materials and make recommendations about those that will best serve our students. Check the Science Page of MYBPS for updates.

Science Materials & Ordering:

Ordering High School Materials:

In the past, the Science Department provided text and kit materials for the implementation of biology, physics and chemistry through grants from the National Science Foundation. Now funding for science materials is at the discretion of the building administrator. Schools are responsible for re-supplying these materials and for making sure that laboratory equipment is available for student use. If schools need support purchasing additional materials from vendors, please contact the department.

Elementary and Middle School Kit Ordering:

All kits for use in classrooms K-8 must be ordered online by the individual who will be teaching with the kit. Simply ask teachers to go to the following web link: <http://tinyurl.com/4394jbb> and complete the kit order form. All kits will be delivered by the BPS Distribution Department. The Science Department will have their materials ready based on the schedules that are shown in the next few pages. **If your materials are not dropped off or picked up on time, please call John Fernandez in Distribution at 617.635.8745.**

K-8 Science Materials Rollout Schedules: 2011-12

The district has developed a materials refurbishment system at the Science Resource Center. Each teacher will receive a refurbished kit according to the schedule below.

Each teacher should complete the kit request form electronically:

<http://tinyurl.com/4394jbb> For the system to work efficiently, it is very important that units are returned on time. We ask all principals to help us with this very important task and make sure that your school has a good system in place for receiving the kits and for their return. If you have questions, please contact Bev Nadeau at 617.635.8750 or bnadeau@boston.k12.ma.us

Schools by zone

East Zone	North Zone	West Zone
Channing	Adams	Bates
Chittick	Baldwin ELC	Beethoven
Clap	Blackstone	BTU
Condon	Bradley	Conley
Dever	East Boston EEC	Curley (Mary)
Everett	Eliot	Ellis
Elihu Greenwood	Gardner	Hale
Sarah Greenwood	Guild	Haley
Grew	Harvard Kent	Haynes EEC
Holland	Hernandez	Hennigan
Holmes	Hurley	Higginson
Kenny	Jackson Mann	J.F. Kennedy
Lee/Lee Academy	Mason	Kilmer
Marshall	Lyon	King
Mattahunt	McKay	Lyndon
Mather	Mission Hill	Manning
Murphy	O'Donnell	Mendell
O'Hearn	Orchard Gardens	Ohrenberger
Perkins	Otis	Mozart
Perry	P.J.Kennedy	Philbrick
Roosevelt	Quincy	Sumner
Russell	Tobin	Trotter
Taylor	Umana Barnes (Alighieri)	West Zone ELC
Tynan	Warren Prescott	Young Achievers
	Winship	
	Winthrop	

Grades Kindergarten - 4 Rollout Schedule:

To determine when specific K-4 units will be in your school, identify the zone in which your school is located on the list on the list above. On the table below, identify the grade level. The unit is then listed by the phase (timeframe) that it will be in your building.

	Phase I Sept 6 - Dec 5	Phase II Dec 12 - March 12	Phase III March 19 - June 11
K2	Zone East- Wood/Paper Zone North – Animals 2x2	Zone North –Wood/Paper Zone West – Animals 2x2	Zone West – Wood/Paper Zone East – Animals 2x2
1	Zone East- Solids and Liquids Zone North – Organisms Zone West – Air/Weather	Zone North – Solids and Liquids Zone West – Organisms Zone East – Air/Weather	Zone West –Solids and Liquids Zone East –Organisms Zone North – Air/Weather
2	Zone East – New Plants Zone North- Pebbles/Sand/Silt Zone West – Insects	Zone North – New Plants Zone West – Pebbles/Sand/Silt Zone East- Insects	Zone West-New Plants Zone East – Pebbles/Sand/Silt Zone North- Insects
3	Zone East – Water Zone North – Physics of Sound Zone West - Structures/Life	Zone North – Water Zone West – Physics of Sound Zone East- Structures of Life	Zone West – Water Zone East – Physics of Sound Zone North - Structures/Life
4	Zone East- Motion and Design Zone North- Magnetism/Electric Zone West-Animal Studies	Zone North – Motion/ Design Zone West-Magnetism/Electric Zone East-Animal Studies	Zone West – Motion/Design Zone East-Magnetism/Electric Zone North-Animal Studies

Grade 5 Rollout Schedule:

There are 4 units taught in Grade 5, so the materials rotation is on a separate schedule. Please find your school listed within the table below and on the next page.

Unit Kit	Phase I Sept 6 - Nov 7	Phase II Nov 14 - Jan 23	Phase III Jan 30 - Apr 2	Phase IV Apr 9 - June 11
Levers and Pulleys	Clap Chittick Channing Everett Elihu Greenwood Sarah Greenwood Grew Henderson Holmes Holland Kenny King Lee/Lee Academy Marshall Mather Mattahunt Murphy Perkins Perry	Adams Blackstone Bradley Edison Eliot Gardner Jackson Mann P.J. Kennedy Mason McKay McKinley Mission Hill O'Donnell Orchard Gardens Otis Umana Barnes (Alighieri) Warren Prescott Winthrop Winship	Bates Beethoven Condon Conley Curley (James) Dickerman Ellis Haley Hennigan Higginson/Lewis J.F. Kennedy Kilmer Lyndon Manning Quincy Tobin Trotter	Dever Guild Hale Harvard Kent Hernandez Horace Mann Hurley Mendell Mildred Ave Mozart Ohrenberger Philbrick Roosevelt Russell Sumner Taylor Tynan Young Achievers
Unit Kit	Phase I Sept 6 - Nov 7	Phase II Nov 14 - Jan 23	Phase III Jan 30 - Apr 2	Phase IV Apr 9 - June 11
Ecosystems	Adams Blackstone Bradley Edison Eliot Gardner Jackson Mann P.J. Kennedy Mason McKay McKinley Mission Hill O'Donnell Orchard Gardens Otis Umana Barnes (Alighieri) Warren Prescott Winthrop Winship	Bates Beethoven Condon Conley Curley (James) Dickerman Ellis Haley Hennigan Higginson/Lewis J.F. Kennedy Kilmer Lyndon Manning Quincy Tobin Trotter	Dever Guild Hale Harvard Kent Hernandez Horace Mann Hurley Mendell Mildred Ave Mozart Ohrenberger Philbrick Roosevelt Russell Sumner Taylor Tynan Young Achievers	Clap Chittick Channing Everett Elihu Greenwood Sarah Greenwood Grew Henderson Holmes Holland Kenny King Lee/Lee Academy Marshall Mather Mattahunt Murphy Perkins Perry

Continued on next page

Grade 5 Rollout Schedule: (continued)

Unit Kit	Phase I Sept 6 - Nov 7	Phase II Nov 14 - Jan 23	Phase III Jan 30 - Apr 2	Phase IV Apr 9 - June 11
Measuring Time	Bates Beethoven Condon Conley Curley (James) Dickerman Ellis Haley Hennigan Higginson/Lewis J.F. Kennedy Kilmer Lyndon Manning Quincy Tobin Trotter	Dever Guild Hale Harvard Kent Hernandez Horace Mann Hurley Mendell Mildred Ave Mozart Ohrenberger Philbrick Roosevelt Russell Sumner Taylor Tynan Young Achievers	Clap Chittick Channing Everett Elihu Greenwood Sarah Greenwood Grew Henderson Holmes Holland Kenny King Lee/Lee Academy Marshall Mather Mattahunt Murphy Perkins Perry	Adams Blackstone Bradley Edison Eliot Gardner Jackson Mann P.J. Kennedy Mason McKay McKinley Mission Hill O'Donnell Orchard Gardens Otis Umana Barnes (Alighieri) Warren Prescott Winthrop Winship
Unit Kit	Phase I Sept 6 - Nov 7	Phase II Nov 14 - Jan 23	Phase III Jan 30 - Apr 2	Phase IV Apr 9 - June 11
Landforms	Dever Guild Hale Harvard Kent Hernandez Horace Mann Hurley Mendell Mildred Ave Mozart Ohrenberger Philbrick Roosevelt Russell Sumner Taylor Tynan Young Achievers	Clap Chittick Channing Everett Elihu Greenwood Sarah Greenwood Grew Henderson Holmes Holland Kenny King Lee/Lee Academy Marshall Mather Mattahunt Murphy Perkins Perry	Adams Blackstone Bradley Edison Eliot Gardner Jackson Mann P.J. Kennedy Mason McKay McKinley Mission Hill O'Donnell Orchard Gardens Otis Umana Barnes (Alighieri) Warren Prescott Winthrop Winship	Bates Beethoven Condon Conley Curley (James) Dickerman Ellis Haley Hennigan Higginson/Lewis J.F. Kennedy Kilmer Lyndon Manning Quincy Tobin Trotter

*Phase II -There will not be a pick up of fifth grade kits during the week of January 23. These kits will be picked up during the week of March 12 with all other grade pick up.

*Phase III - There will not be a pick up of fifth grade kits during the week of April 2. These kits will be picked up during the week of June 11 with all other grade pick-ups

Middle School Materials Rollout Schedule:

The district has developed a materials refurbishment system at the Science Resource Center. Each teacher will receive a refurbished kit according to the schedule below.

Each teacher should complete the kit request form electronically:

<http://tinyurl.com/4394jbb> For the system to work efficiently, it is very important that units are returned on time. We ask all principals to help us with this very important task and make sure that your school has a good system in place for receiving the kits and for their return. If you have questions, please contact Bev Nadeau at 617.635.8750 or bnadeau@boston.k12.ma.us

To help schools order materials that are not part of a kit such as microscopes, balances, etc., the Science Department posts a list on MyBPS for these materials. Schools may order through the Science Department by following the directions on the website.

Grade 6 Rollout Schedule:

There are 2 units taught in Grade 6, so the materials rotation is on a separate schedule. Please find your school listed within the table below, identified by kit and phase (timeframe).

	Phase I <i>Sept 6 - Jan 16</i>	Phase II <i>Jan 30 - June 11</i>		Phase III <i>Sept 6 - Jan 16</i>	Phase IV <i>Jan 30 - June 11</i>
Human Body	S Greenwood	BTU	Weather and Water	BTU	S Greenwood
	Harbor	Dearborn		Dearborn	Harbor
	Hernandez	Edison		Edison	Hernandez
	Hurley	Edwards		Edwards	Hurley
	Kilmer Upper	Eliot		Eliot	Kilmer Upper
	King	Frederick		Frederick	King
	Lyndon	Higginson-Lewis		Higginson-Lewis	Lyndon
	McCormack	Horace Mann		Horace Mann	McCormack
	McKinley	Irving		Irving	McKinley
	Orchard Garden	Jackson Mann		Jackson Mann	Orchard Garden
	Perry	Latin Academy		Latin Academy	Perry
	Rogers	Lyon Mary		Lyon Mary	Rogers
	Tech Boston	Curley		Curley	Tech Boston
	Timility	McKay		McKay	Timility
	Tobin	McKinley Mid St Mary's St.		McKinley Mid St Mary's St.	Tobin
	Umana Barnes	McKinley South End		McKinley South End	Umana Barnes
	UP Academy	Mildred Ave		Mildred Ave	UP Academy
	Warren Prescott	Mission Hill		Mission Hill	Warren Prescott
	Young Achievers	Murphy		Murphy	Young Achievers
		O'Bryant		O'Bryant	
		Ohrenberger		Ohrenberger	
		Quincy Upper		Quincy Upper	

Grades 7 and 8 Rollout Schedule:

To determine when specific 7th and 8th grade units will be in your school, identify the triad in which your school is located on the Triad list below. Then use the second table to identify the grade level. The unit is then listed by the phase (timeframe) that it will be in your building.

Triad A	Triad B	Triad C
Dearborn Edwards Eliot McCormack McKay McKinley South End McKinley Mid. (St Mary St.) Ohrenberger Orchard Gardens Perry Quincy Middle Umana Barnes UP Academy Warren/Prescott	Boston Latin School Edison Frederick Harbor Horace Mann Jackson Mann King Mission Hill Rogers Roosevelt Timilty Tobin Young Achievers	Boston Latin Academy Curley S. Greenwood Hernandez Irving Kilmer Upper Lewis Lyndon Lyon Mildred Ave Murphy O'Bryant Tech Boston Academy

Grade 7 and Grade 8

Grade	Phase I Sept 6 – December 5	Phase II Dec 12 – Mar 14	Phase III Mar 21 – June 11
7	Triad A – Diversity of Life Triad B – Earth History Triad C – Force/Motion	Triad A – Force/Motion Triad B – Diversity of Life Triad C – Earth History	Triad A – Earth History Triad B – Force/Motion Triad C – Diversity of Life
	Phase I Sept 6 – December 5	Phase II Dec 12 – Mar 14	Phase III Mar 21 – June 11
8	Triad A – Chem. Interactions Triad B -Planetary Sci. Triad C – Pop/Ecosystems	Triad A – Pop/Ecosystems Triad B – Chem. Interactions Triad C -Planetary Sci.	Triad A – Planetary Sci. Triad B – Pop/Ecosystems Triad C – Chem. Interactions

Section 3: Science Assessment Program

Classroom Level Assessments:

The science instructional materials that have been adopted by the district include:

- ❑ Formative Assessments
- ❑ Summative Assessments
- ❑ End-of-Module Assessments
- ❑ Assessment Charts

These assessment tools are included in the teacher's guides that accompany each unit.

*All teachers, K-12, should be using formative and summative assessments to determine each student's proficiency in science.

Keeping a Science Notebook:

All of the science units require students to read and write about what they are learning in science. Students should keep a science notebook in order to increase their understanding of science, use writing as a process for discovery, to improve their ability to organize their ideas and information and to recognize the connection between thinking and writing. Notebooks will vary according to the developmental level of the child and may include prepared worksheets as well as student generated responses. Strategies for developing and assessing science notebooks are included in the district science training and also in each unit's teacher's guide. *Rubrics for K-2, 3-5 and 6-12 are posted on the Science page of MyBPS.*

District Level Assessments: Science grades 6-11

All science teachers should participate in the assessment program and administer the exams under testing conditions. There should be no changes made to the exam by teachers under any circumstances. Science Assessments are developed by department staff and science teachers for students in the following courses:

Course Number*	Course Title
536	Grade 6 Unified Science
537	Grade 7 Unified Science
538	Grade 8 Unified Science
555	Physics
553	Biology
554	Chemistry

* The exams should be administered in honors level courses as well.

High school teachers of these courses are expected to administer Mid-Course and End-of-Course exams. At the middle school level, students are expected to take the End-of-Course exams. Optional end of "kit" exams are available for all middle school units and are posted on MyBPS.

District Assessment Format:

Each Mid-Course and End-of-Course Assessment is divided into two parts – 25 multiple choice questions and students select 2 of 3 open response questions to be scored by teachers. Exams are provided electronically through the district's providers and can also be sent to a school administrator via email if that assists schools with the process of administering them. An answer key for the MC questions and a scoring guide is provided for each question in the teacher letter accompanying the exams.

Mid-Course and End-of-Course exams are provided for Physics, Biology and Chemistry. Only End-of-Course exams are provided for middle school science.

MCAS Competency Determination Graduation Requirement:

Students must earn a scaled score of at least 220 on one of the [high school MCAS Science and Technology/Engineering \(STE\) tests: Biology, Chemistry, Introductory Physics, or Technology/Engineering](#). [Note that there is an exception for students who were originally in the class of 2009 or an earlier class and meet certain criteria.](#)

Students have the right to participate in MCAS tests and retests. Students may participate in STE tests in February (Biology only) and June each year. Individuals may continue to participate in ELA and Mathematics retests and STE tests after leaving high school. Students with disabilities who are unable to participate in standard MCAS tests, even with accommodations, can earn a CD through the [MCAS Alternate Assessment \(MCAS-AIT\)](#), which provides an opportunity for students to demonstrate their academic knowledge and skills through a collection of work samples (portfolio).

MCAS (STE) Testing Schedule 2011-2012

Grade	Test	Allowable Administration Dates	Number of Sessions	Session Length Avg. # of Min.
February 2012 MCAS High School Biology Test				
High school	Biology, Session 1	February 1	1	60
	Biology, Session 2	February 2	1	60
May 2012 MCAS Tests				
Grades 5 and 8	Science and Technology/Engineering (STE)	May 8–May 22	2	45
June 2011 MCAS: High School STE Tests Biology, Chemistry, Introductory Physics, Technology/Engineering				
High school	High School STE, Session 1	June 5	1	60
	High School STE, Session 2	June 6	1	60

Note: Refer to the appropriate *Principal's Administration Manual* (PAM) for more information, including participation guidelines, the prescribed order for administering each grade's tests, the policy for make-up testing, and deadlines for materials pickup, and to <http://www.doe.mass.edu/mcas/cal.html> for sample test administration schedules.

High School MCAS:

Students who are enrolled in grades 9/10 and who are taking Introductory Physics, Biology, Chemistry or Engineering must take this exam in June. For those schools that are on a block schedule, only Biology will be given in February 2012; the remaining Science MCAS exams will only be given in June. Students that will take their science course during the first semester should be provided with opportunities for review. The DOE has made available released test items that are suitable for this purpose.

<http://www.doe.mass.edu/mcas/testitems.html> Additionally, the science department organizes PD sessions for teacher to help them better support students as they prepare to take the Biology exam. Please contact us for assistance.

High School Science and Technology/ Engineering Competency Determination

*On August 31, 2009 the DOE released the following document. (At present, there is no update posted. Some information has been edited.)

Massachusetts Comprehensive Assessment System

Reminder about the New Competency Determination Requirement Beginning with the Class of 2010

To: Superintendents, High School Principals, and Directors of Charter Schools, Approved Private Special Education Schools, Educational Collaboratives, and Special Education in Institutional Settings

Copy: MCAS Test Coordinators

From: Mitchell D. Chester, Ed.D., Commissioner of Elementary and Secondary Education

Date: August 31, 2009

I am writing to remind you about new Competency Determination (CD) requirements that go into effect in 2010. Beginning with the class of 2010, students must either earn a scaled score of at least 240 on the grade 10 MCAS [ELA](#) and [Mathematics](#) tests, or earn a scaled score between 220 and 238 on these tests and fulfill the requirements of an [Educational Proficiency Plan \(EPP\)](#). Also beginning with the class of 2010, students must earn a scaled score of at least 220 on one of the [high school MCAS Science and Technology/Engineering \(STE\) tests: Biology, Chemistry, Introductory Physics, or Technology/Engineering](#). More information about the high school graduation requirements, including information about retesting opportunities and Educational Proficiency Plans (EPPs), is posted on the Department's website at www.doe.mass.edu/mcas/graduation.html.

To assist educators in making appropriate coursework and assessment decisions for students in the class of 2010, the Department posted CD attainment status data files to the Security Portal this summer. Please refer to my [August 5, 2009 memorandum](#) for instructions on accessing these files. In addition, superintendents will soon receive a list of students, by high school, who have not yet participated in a high school STE test.

I also want to remind you about the [MCAS Performance Appeals](#) process as an option for a student to earn a CD. In order to be eligible, a student must meet a minimum attendance rate, participate in tutoring, and must have participated in the MCAS high school tests/retests or the MCAS Alternate Assessment (MCAS-Alt) as follows:

- **ELA:** at least three times or MCAS-Alt twice
- **Mathematics:** at least three times or MCAS-Alt twice
- **STE:** once or MCAS-Alt at least once **and** must be currently enrolled in a STE course

Please contact Student Assessment Services at 781-338-3625 or mcas@doe.mass.edu with questions about the CD and MCAS testing. Please contact Secondary School Services at 781-338-3010 or achievement@doe.mass.edu with questions about EPPs. You may contact the MCAS Performance Appeals group at 781-338-3333 or mcasappeals@doe.mass.edu.

Thank you for your attention to this important matter.

You may find additional Information about the STE Exams on the DESE Website:

Test Design and Development: <http://www.doe.mass.edu/mcas/tdd/sci.html>

Graduation Requirements: <http://www.doe.mass.edu/mcas/graduation.html>

Science Advanced Placement Exam Schedule

The Science Department will be supporting students who are taking an AP science program by offering practice exams for students in the spring and tutoring and mentoring opportunities throughout the school year. The Boston Science Partnership is also helping schools to offer summer Bridge to AP programs. For information about AP support for students and teachers please see the Boston Science Partnership website for information. <http://www.bostonscience.org/>

Science Advanced Placement 2012 Exam Calendar			
	Morning - 8 a.m.*	Afternoon - 12 noon*	Afternoon - 2 p.m.
Monday, May 7, 2011	Chemistry Environmental Science		
Monday, May 14, 2011	Biology	Physics B Physics C: Mechanics	Physics C: Electricity and Magnetism

<http://professionals.collegeboard.com/testing/ap/about/dates>

Section 4:

Professional Development Plan

“When teachers have an opportunity to describe their own views about learning and teaching, and to compare and contrast, and revise their views, they come to understand the nature of exemplary science teaching.”

A complete catalog is posted on the MyBPS and on MyLearningPlan.com. Please check it frequently as we add new workshops throughout the school year.

Elementary Science Unit Training:

Introductory level workshop for those new or in need of a refresher in a particular unit.

Emphasis will be placed on deepening content knowledge and experiencing inquiry centered instructional practices while being guided through all the investigations in the unit. Teachers that participate in a six-hour training will receive their own teacher's guide and use of a completely equipped science kit.

Workshops for BPS Science Instructional Materials: Middle and High School

Introductory level workshop for those new or in need of a refresher in a unit/course.

Each summer and during the academic year the Science Department offers introductory workshops in BPS curriculum instructional programs for teachers who are new to the particular unit/program. The courses are taught by an instructional team comprised of Peer Teacher Workshop Leaders who are BPS teachers experienced in the use of the materials and who have had extensive preparation in leading PD. Novice, transitioning, SPED and ELL teachers are particularly encouraged to attend. Participating teachers will receive teacher's guides and may be eligible to receive in-service credit. A detailed schedule is posted on the science section of MyBPS and on www.MyLearningPlan.com

Academic Year Support for All BPS Science Teachers:

Designed for any teacher who is teaching science.

During the academic year, teacher leaders and science department staff will offer workshops on a variety of topics, such as Science Notebooks; Grade 5 MCAS Review; MCAS Biology Prep; Claim, Evidence, and Reasoning; Common Writing Assignments; and Science and Literacy. Novice, transitioning, SPED and ELL teachers are particularly encouraged to attend. For additional information and schedules, see the Science page of MyBPS and www.MyLearningPlan.com

After School Science Club Training:

A small grant has been received to provide teachers and/or after school facilitators with materials and training to conduct 20 after school science programs. Schools/Teachers who wish to continue their participation must attend a one-hour training session. For information please contact Bev Nadeau at bnadeau@boston.k12.ma.us.

Graduate Level Courses and Workshop Offerings:

Open to any teacher who would like to improve their content knowledge, teaching skills and understanding of students and the ways that they learn.

From time to time some of our university partners offer courses designed specifically for BPS science teachers, in a variety of topics. For information and to register, go to <http://www.mylearningplan.com>

Additional workshop information can also be found on the Science page of MyBPS.

Collaborative Coaching and Learning in Science (CCLS):

In 2004, the Science Department in collaboration with UMB, Northeastern University, the College Board and Harvard Medical School, received a grant from the National Science Foundation to establish the Boston Science Partnership (BSP). This grant has enabled us to introduce CCLS in middle and high schools throughout the district. Although the broad funding support for this work is now over, the science department has residual funds that will allow us to provide limited support.

In our CCLS model, a teacher facilitator from the participating school leads the CCLS group. The facilitator receives support and professional development from the BSP. Each CCLS cycle includes classroom observations, reflection and inquiry, and reviewing students' work. Principals of participating schools will be asked to select a teacher facilitator who will coordinate the CCLS group in their building. Principals who are interested in having teachers participate in a CCLS cycle in their school should contact Pam Pelletier via email at ppelletier@boston.k12.ma.us.

New Science Teacher Support:

In addition to the formal BPS New Teacher Developer Program, the Science Department will work directly with new teachers in their buildings as they begin their careers in science teaching. Time will be spent with individual and small groups of new teachers to help them meet the challenges and to help them thrive as they implement our active, engaging science curricula. Principals and Headmasters are encouraged to contact Senior Program Director Pam Pelletier at ppelletier@boston.k12.ma.us or 617-635-8750 to request support.

Teacher Leaders, Peer Workshop Leaders and Science Education Fellows:

The Science Department has funded various teacher leader development programs through a variety of grants. Science teacher leaders may lead district-wide professional development sessions, assist with curriculum pacing guides, pilot and select instructional materials and help to develop district assessments. These teacher leaders may be asked to provide or attend district trainings as well as a PD Retreat. Participating teacher leaders may receive a stipend and substitute coverage if needed. Headmasters and Principals will be asked to give permission for teacher leaders to participate; only with the permission of the building administrators will teachers be allowed to attend.

Section 5:
Key Dates: Assessment and PD

Dates	Test	Grades
November 1-7	BPS Science Mid-Course Assessments -- schools with half-year courses	9-11
December - May	Common Writing Assignment	4-8
December - May	Common Writing Assignment High School PILOT	9-12
January 9-20 for Computer based tests and January 17-23 for paper & pencil tests	BPS Science End of Course Assessments -- schools with half-year courses BPS Science Mid-Course Assessments -- schools with year-long courses	6-11
TBA: Late Jan – Early Feb	Science Week: School-based Science Fairs	6-12
February 1-2	MCAS Biology	9-12
TBA: Early March	Citywide Science Fair	6-12
April 4-11	BPS Science Mid-Course Assessments -- schools with half-year courses	9-11
May 7	AP Exams: Environmental Science and Chemistry	
May 14	AP Exams: Biology and All Physics	
May 8-22	MCAS STE Grades 5 and 8	5 and 8
June 5-6	MCAS: Physics, Biology, Chemistry, Tech/Engineering	9-12
June 6-15 for Computer based tests and June 11- 18 for paper & pencil tests	BPS Science End of Course Assessments	6-11

All Science Department PD is listed on MyLearningPlan.com, and sessions are often noted on MyBPS, and Superintendent's Circulars as well.

Section 6:

Web & Print Resources

There are many resources that the science department uses to drive the work of science teachers and to guide the professional development that we provide for teachers, administrators, families, and university and community partners. We have included information about some of these documents and websites that we frequently use as reference. Please contact the science department directly for additional information.

National Research Council, *How Students Learn: Science in the Classroom*, (Washington, D.C.: National Academy Press, 2005), ISBN -10-309-08950
http://www.nap.edu/catalog.php?record_id=11102

National Research Council, *Ready, Set, Science: Putting Research to Work in K-8 Science Classrooms* (Washington, D.C.: National Academy Press, 2008), ISBN-13:978-0-309-10614-6
http://www.nap.edu/catalog.php?record_id=11882

National Research Council, *National Science Education Standards* (Washington, D.C.: National Academy Press, 2001), ISBN-10: 0-309-06235-7
http://www.nap.edu/catalog.php?record_id=4962#toc

National Research Council, *How People Learn* (Washington, D.C.: National Academy Press, 2005), ISBN-10: 0-309-07036-8
http://www.nap.edu/catalog.php?record_id=6160

American Association for the Advancement of Science, *Benchmarks for Science Literacy, Project 2061* (New York, Oxford University Press, 1993), ISBN 0-19-508986-3
<http://www.project2061.org/publications/bsl/online/index.php>

American Association for the Advancement of Science, *Atlas of Science Literacy Project 2061* (U.S.A. American Association for the Advancement of Science, 200), ISBN 0-87168-668-6
<http://www.project2061.org/publications/atlas/default.htm>

Massachusetts Department of Education, *Massachusetts Science and Technology/Engineering Curriculum Framework*
<http://www.doe.mass.edu/frameworks/current.html>

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas—this is the document that is guiding the development of new science standards nationwide.
http://www.nap.edu/catalog.php?record_id=13165

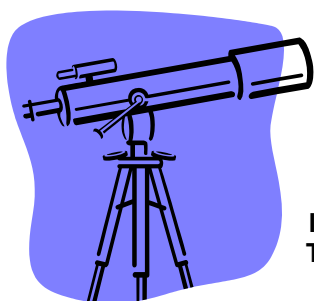
For more information about what is happening with the development of the Common Core for Science, see the Achieve website: <http://www.achieve.org/next-generation-science-standards>

Science Classroom Observation Guide

The resources that were developed by the North Cascades and Olympic Partnership are very helpful in the observation of teachers. [The Science Classroom Observation Guide](http://www.ncosp.wvu.edu/Tools/index.php?toolID=4) is designed to help groups develop a shared understanding of effective science instruction. See the website for instructions and supports for using this tool.
<http://www.ncosp.wvu.edu/Tools/index.php?toolID=4>

On the next few pages, you will find –

- ❑ **The “Science Socials” Schedule—please share with teachers and come join us as well!**
- ❑ **A letter that you can share with families with regard to science in the BPS.**



Introducing... the 2011-12 Science Socials!!

It is a big year! We are happy to announce the 5th year of the Boston Science Teachers' "Science Socials"!

On the last Friday of each month, from 3-7pm, come join us as we relax, network, and enjoy the company of the dynamic BPS science community across the city. Each month features a different neighborhood and different host schools. School colleagues, cooperating partners, and student teachers are invited as well. Special thanks to the UMass COSMIC office for sponsoring appetizers. We look forward to seeing you each month!

Date:	Location:
9/30/11	Savin Hill Bar and Kitchen, Dorchester
Host Schools:	Mather Elementary School and Harbor School
10/28/11	BYEN Event, TBD
Host Schools:	NA
11/18/11	West on Centre, West Roxbury
Host Schools:	Urban Science Academy and Lyndon K-8 School
12/16/11	Tasty Burger, Fenway
Host Schools:	Boston Latin School and Edward M. Kennedy Academy for Health Careers
1/27/12	Redd's in Rozzie, Roslindale
Host Schools:	Irving Middle School and Bates Elementary School
2/17/12	Doyle's, Jamaica Plain
Host Schools:	English High School and Boston Teachers Union K-8 School
3/30/12	Victoria's Diner, Roxbury
Host Schools:	John D. O'Bryant School of Math and Science and Timilty Middle School
4/27/12	Canary Square, Jamaica Plain
Host Schools:	Curly K-8 and J.F. Kennedy Elementary School
5/25/12	Local 149, South Boston
Host Schools:	Perry K-8 and Tynan Elementary School
6/15/12	Ashmont Grill, Dorchester
Host Schools:	TechBoston Academy and Dorchester Academy



For more information, please email:

High School: Johanna Mendillo, John D. O'Bryant School, (jmendillo@boston.k12.ma.us)

Middle School: Jennifer Felicetti, Curley K-8 School, (jfelicetti@boston.k12.ma.us)

Elementary School: Erin Hashimoto Martell, Nathan Hale School, (ehashimoto@boston.k12.ma.us)

Note: Locations subject to change & cancelled on BPS snow days. Visit <http://sciencesocials.blogspot.com> for more.

Dear Parent(s)/Guardian(s):

We all know that children are naturally curious. They ask their parents hundreds of questions on a daily basis. Questions like, why is the sky blue? Why do things fall to the ground? How do seeds grow? What makes sound and music and where do mountains come from?

In search of answers, we use science to both enlighten and delight. As parents, we must prepare our children for a world vastly different from the one in which we grew up. Today and in the near future this country will need citizens with more training in science and technology than most of us had in school.

An education in science feeds that curiosity and provides students with valuable concepts, life skills, and career options. Science helps give kids a greater appreciation for the world, a healthy dose of skepticism, strong problem-solving skills, and research know-how.

Educators and policymakers are working together to improve science in our schools because we believe that when children explore and learn about the world around them and how it works, they gain a better understanding of, and appreciation for, nature and the interdependence of living things and their environments.

By working together we can help children become scientific thinkers and excellent students, but how can parents help you may ask? Here are a few suggestions from a book entitled, *Helping Your Child Learn Science*, by the U.S. Department of Education's Office of Educational Research and Improvement:

Make an appointment to visit your child's school.

During your visit, look for clues and see what kind of science instruction is available.

- ☐ Do you see displays related to science? Are there any science learning centers? Is there evidence of students doing science?
- ☐ Are science-related drawings on the bulletin boards? Are there plants, terrariums, aquariums, or collections (of rocks or insects, for example)?
- ☐ Do you see any science equipment in evidence? Are there magnifiers? Magnets? Pictures?
- ☐ Does the school library contain science books? If so, ask the librarian if the children are encouraged to read them.

-more-

- ❑ Is there enough space in the classrooms or elsewhere in the school for students to conduct experiments?
- ❑ In science classes, do students work with materials and/or science kits or is the teacher always demonstrating? Do students discuss their ideas, predictions, and explanations with each other as well as with the teacher?

We also encourage parents to ask questions about the science program at parent-teacher conferences or PTA meetings, or set up an appointment with the school principal. The following questions can provide you with information about the science program at your child's school.

- ❑ How often is science taught, every day, once a week, or only once in a while?
- ❑ Do the school and/or your children's teachers have clear goals and objectives for teaching science?
- ❑ Can students do hands-on science projects?
- ❑ Are activities available that parents can use at home to supplement class instruction?
- ❑ Is your child required to keep a record of what they are learning in science? Do they keep a Science Notebook?

In addition to learning science in school, the City of Boston provides an abundance of opportunities and activities to learn science. Almost all children enjoy a field trip. Here are a few suggestions:

- ❑ Take a trip to the **Zoo New England: Franklin Park Zoo**. Encourage your child's interest in the natural world and introduce them to the many fascinating forms of life.
- ❑ The **Museum of Science** and the **Boston Children's Museum** interests visitors of all ages and provides opportunities for hands-on activities. For museums with, levers to pull, lights to switch on, buttons to push, animals to stroke and experiments to do, you can also check out our neighbors at the **MIT Museum** or the **Harvard Museum of Natural History**.
- ❑ **The Charles Hayden Planetarium** at the **Museum of Science** offer wonderful exhibits and activities for youngsters. Inside planetariums, children often can, use telescopes to view the rings of Saturn, see the "sky" with vivid clarity from inside the planetarium's "starry" dome, and take an adventure to outer space.
- ❑ **The New England Aquarium** enables youngsters to see everything from starfish to electric eels. Children particularly enjoy feeding times. Call ahead to find out when the penguins, sharks, and other creatures get to eat. And check for special shows with sea lions and dolphins.
- ❑ Visit a **Boston Public Library** in your neighborhood to obtain discounted passes to museums throughout the city. For detailed information, rules and regulations and a complete list of museums, please visit http://www.bpl.org/general/circulation/museum_passes.htm.

We all play a crucial role in determining how much science our children learn. Our enthusiasm and encouragement can spark their interest. Fortunately, youngsters of all ages are curious and love to investigate. And the earlier we encourage their curiosity, the better!

Please feel free to contact the BPS Science Department at (617) 635-8750 with questions or for further information. Thank you in advance for your support.

Section 7:

Administrative Support

Major Grants and Special Projects

The Boston Science Partnership Phase 2: BEST

The BSP: BEST is a new \$2.1M grant that is following on the heels of a \$14.2 million grant from the National Science Foundation. The BSP supports CCLS, content courses and vertical teaming. Interested middle and high school administrators should contact Pam Pelletier at ppelletier@boston.k12.ma.us or 617-635-8750.

Stay informed about the Boston Science Partnership through the program website: <http://www.bostonscience.org>

Science Education Fellowship:

The Boston Science Partnership (BSP) received a grant from the National Science Foundation (NSF) to create the **Science Education Fellowship** (SEF), a program that encourages teachers to build upon their existing skills, while teaching in Boston's public schools. Each Fellow is required to have expertise in a core science subject (biology, chemistry, physics, or earth science) at the elementary, middle or high school level. SEF's goals are to increase the science achievement of students across the city from grades 6 through college. The BSP is NSF-funded and partners with three institutions: the University of Massachusetts Boston, The Boston Public Schools and Northeastern University.

Elementary After School Program Funding:

The Science Department has received funding from the Pierce Charitable Trust to implement the Youth Explorations in Science Program. For an overview of the program please go to the YES website at <http://www.yescience.com/flashindex.html>. If you would like your school to participate please contact Bev Nadeau at bnadeau@boston.k12.ma.us

Citywide Science Fair March 2012:

The Citywide Science Fair will once again be held in early March at a site to be determined. Students who are pursuing research this summer and who plan to enter the fair must follow all of the state science fair regulations. These regulations are spelled out on the Massachusetts State Science Fair website - <http://www.scifair.com/> This website contains all necessary student and research advisor forms. Please make sure all of your students follow these directions exactly. In the past we have had students that were disqualified from the Fair because they failed to have the correct paperwork submitted.