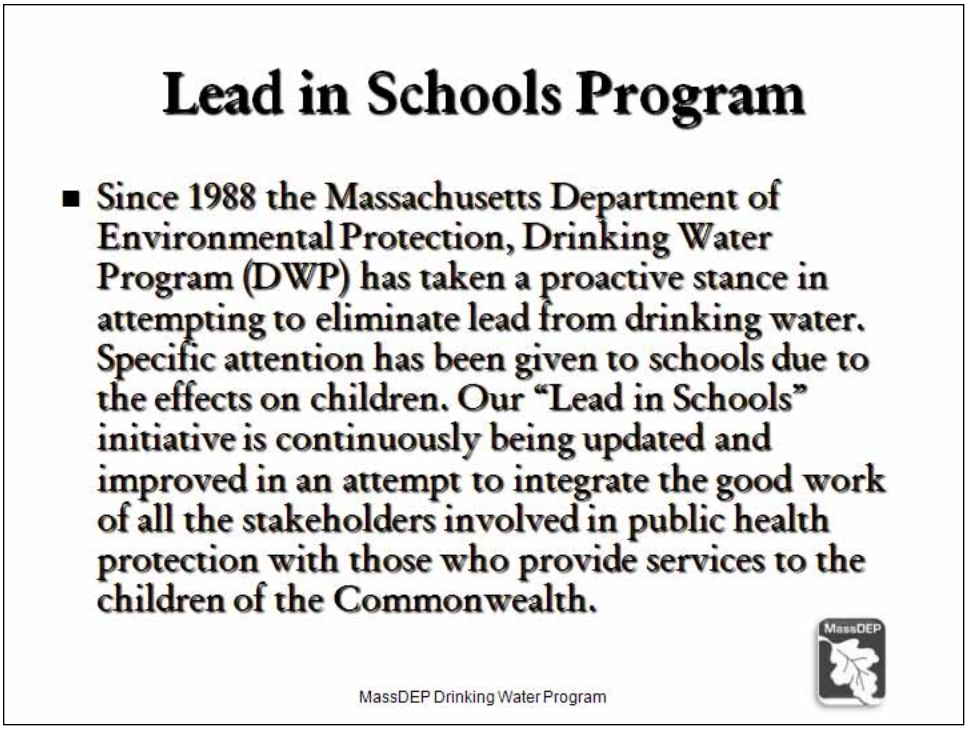
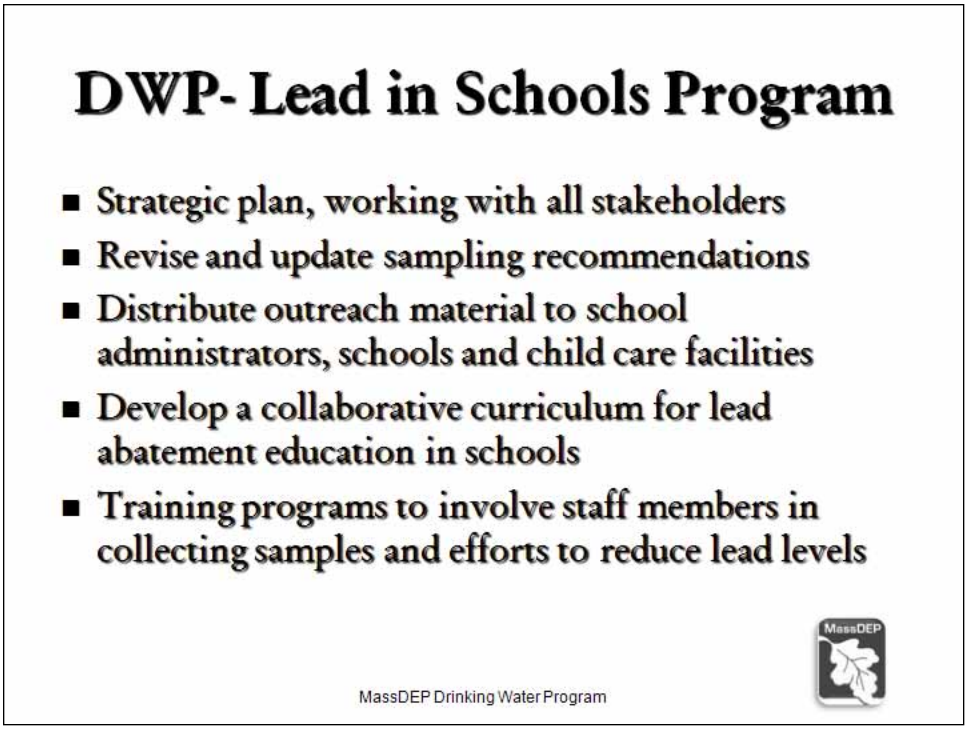
Lead in Drinking Water

Program for Schools and Child Care Facilities

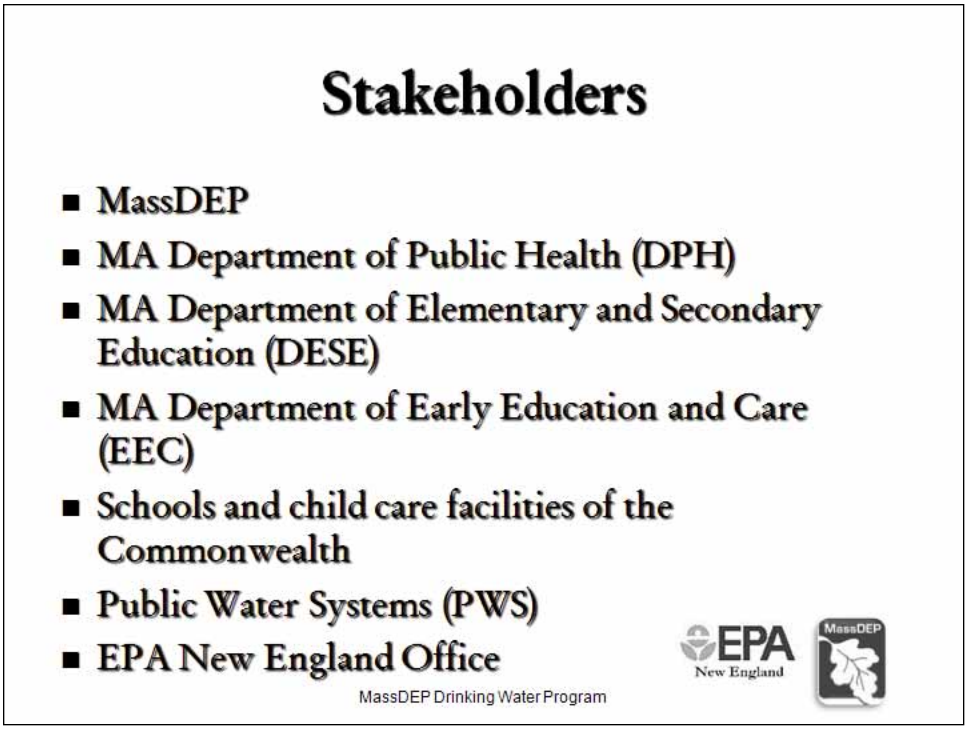
MassDEP Drinking Water Program



As a partner in the Lead Contamination Control Act, the Massachusetts Department of Environmental Protection, Drinking Water Program (DWP) has taken a proactive stance in attempting to eliminate lead from drinking water. Specific attention has been given to schools due to the effects on children. Our "Lead in Schools" initiative is continuously being updated and improved in an attempt to integrate the good work of all the stakeholders involved in public health protection with those who provide services to the children of the Commonwealth.



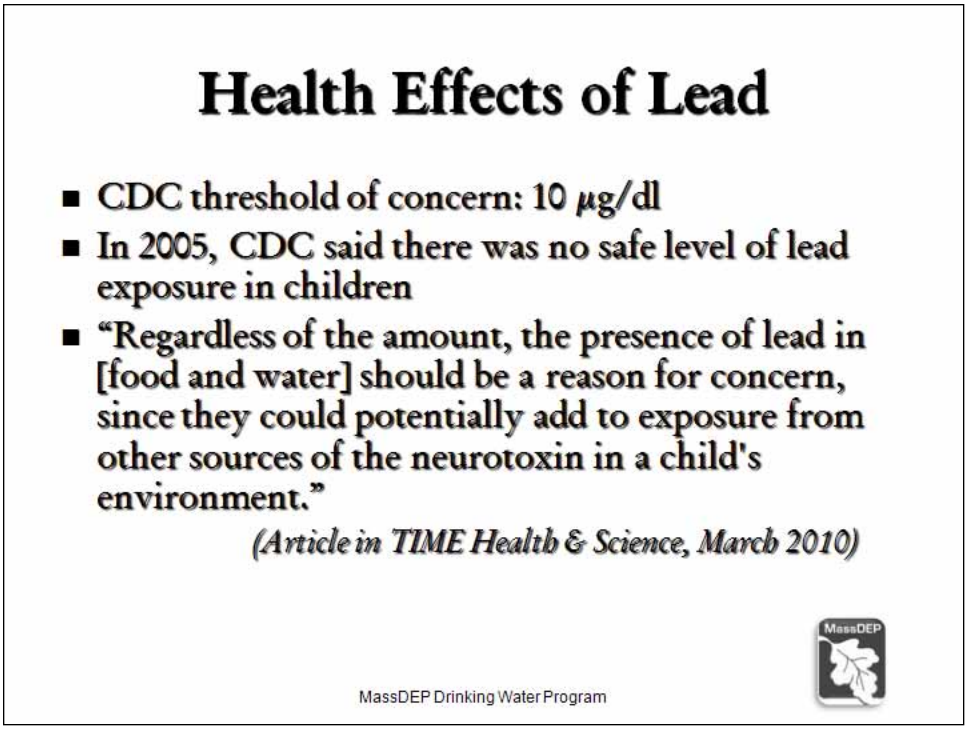
The Drinking Water Program has developed a strategic plan to assist schools. We revise our recommendations every 3-5 years, taking into account new information and research studies. This information is passed on to schools and child care facilities in letters and other outreach material. Currently the Lead in Schools program is working with the EPA New England office to develop a collaborative curriculum to give schools better ownership over their drinking water protection efforts. We are hoping to encourage science teachers to incorporate lessons about lead and water-borne contaminants into units on clean drinking water and health. Furthermore, the DWP provides training programs for custodial and other staff members to best protect water outlets against elevated lead levels.



A list of the stakeholders includes MassDEP, MA Department of Public Health, MA Department of Elementary and Secondary Education, schools and child care facilities of the Commonwealth, Public Water Systems (PWS), and the EPA New England Office.

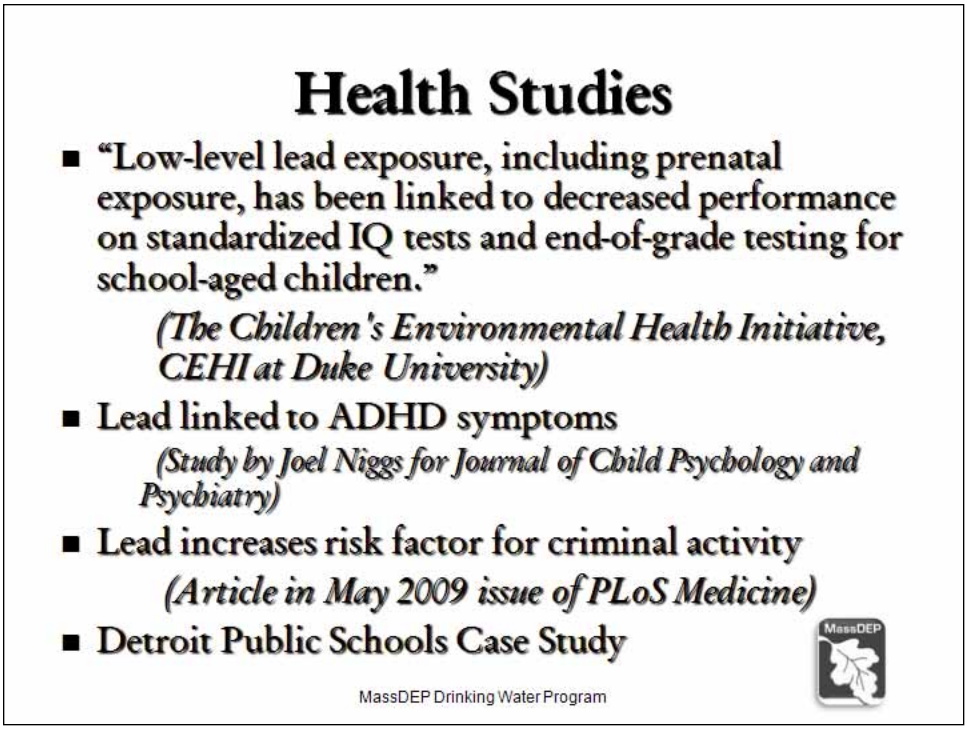
Recently, state legislative initiatives have prompted a strengthening of lead free standards and regulations beyond those established in the Safe Drinking Water Act of 1974 and its amendments. Most notably, a California law has been passed and went into effect on January 1, 2010 requiring that all plumbing material contain a weighted average of 0.25% lead or less. This is a reduction of the 8% lead standard for pipes established in the Safe Drinking Water Act. The new lead free terminology is moving to the national level, as a bill proposed by Anna Eshoo of California to adopt the 0.25% standard just passed in subcommittee and is currently under review in the House Energy and Commerce Committee. Moving towards completely lead-free materials is advised as we expect to see a more stringent national lead regulation in the near future.

From a health standpoint, the mental and physical impairments linked with lead exposure include IQ deficits (can be severe depending on exposure levels), symptoms of ADHD, hearing damage, behavioral problems, stunted growth, and lowered birth weight. It is especially a concern for children and pregnant women, as fetuses are at greatest risk for lifelong problems.



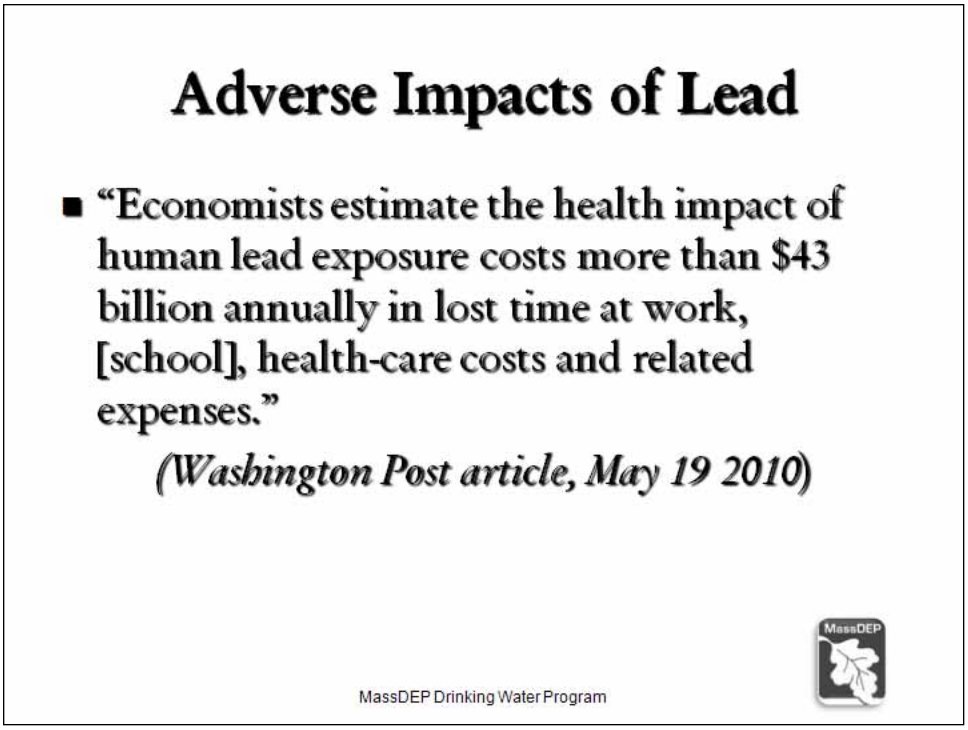
The Centers for Disease Control established a threshold of concern at 10 micrograms per deciliter, but in 2005 said that there is no level of exposure in children that can be declared free of health risks. Chronic low-level exposure can accumulate and impair development, as it can interact with exposure to lead and neurotoxins from other sources in the environment.

We should all work to get lead exposure down to zero.

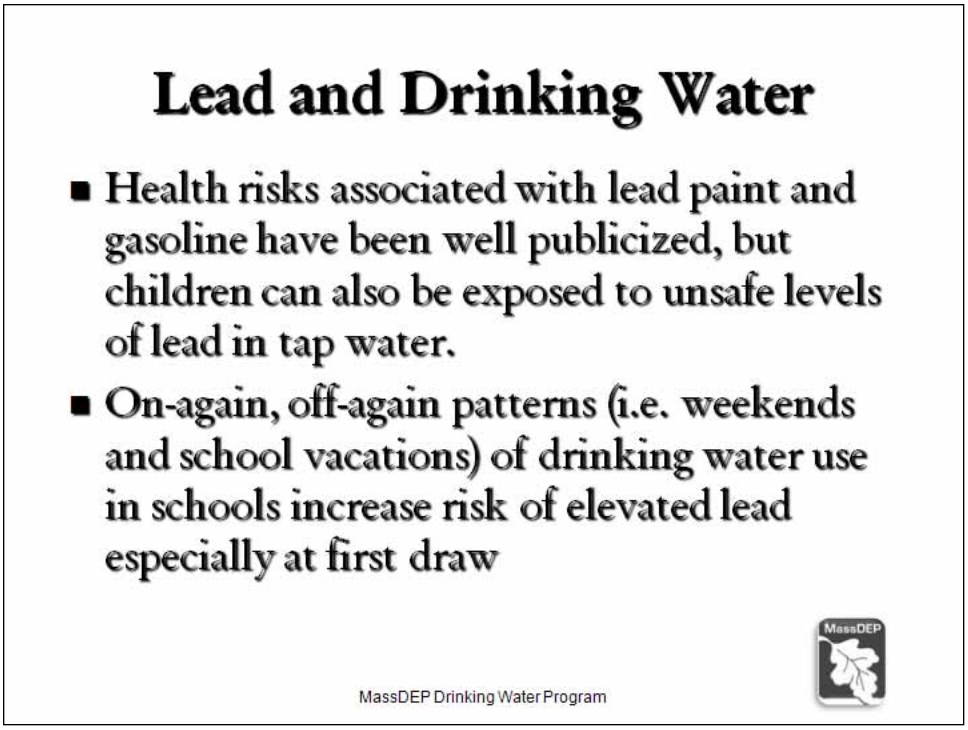


The Children's Environmental Health Initiative at Duke University has confirmed health risks at low levels of exposure, and other studies in the Journal of Child Psychology and PLoS Medicine have linked lead exposure to ADHD symptoms and increased tendency for criminal activity.

A case study from Detroit Public Schools was recently published in an online newspaper stating that "more than half of the students tested in Detroit Public Schools have a history of lead poisoning, according to data compiled by city health and education officials." This has led to lower standardized test scores. Children receiving special education were also more likely to have lead poisoning. The legacy of lead in children's health is persistent and troubling across the nation, so we can't let our schools get complacent about lead!



A Washington Post article about the national lead legislation included the statistic that the opportunity cost of health impacts due to lead is $43 billion annually, covering lost time at work, school, and health care expenses.



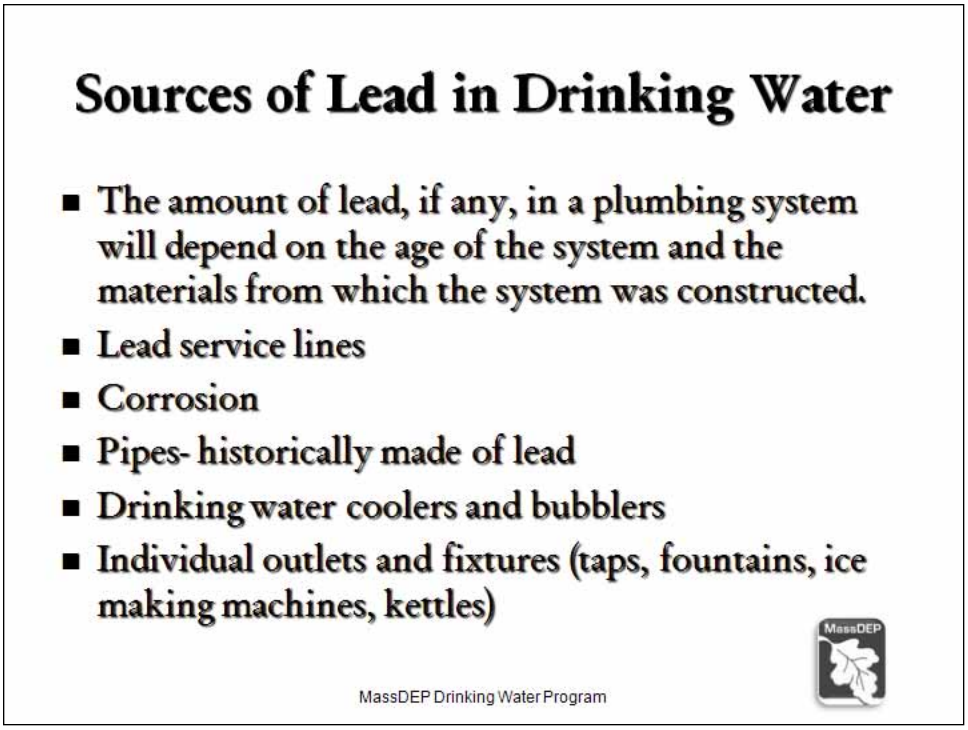
Drinking water at the tap can be a source of lead exposure because of plumbing materials coming in contact with the potable water supply. The on-again, off-again patterns of drinking water use in schools increases the risk for elevated lead levels at first draw.

Lead and Drinking Water

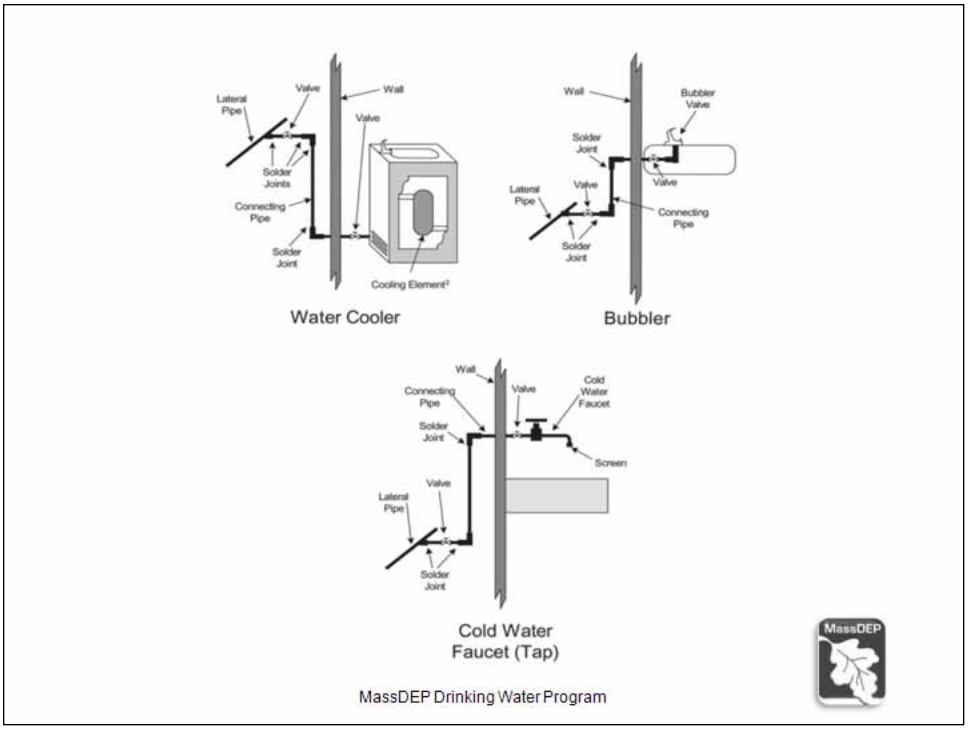
- On average, it is estimated that lead in drinking water contributes between 10 and 20 percent of total lead exposure in young children.
- MassDEP action level for lead in school drinking water: 0.015 mg/L

MassDEP Drinking Water Program

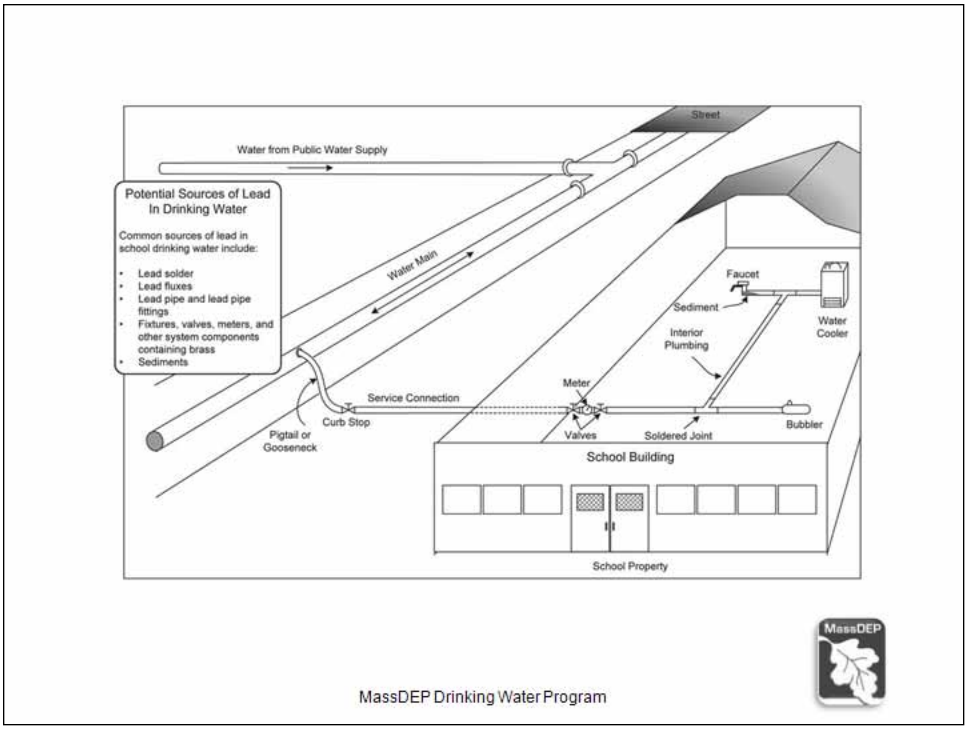
The EPA estimates that lead in drinking water contributes between 10 and 20 percent of total lead exposure in young children; this percentage is higher in infants. The MassDEP action level for lead in school drinking water is 15 ppb or 15 milligrams per liter.



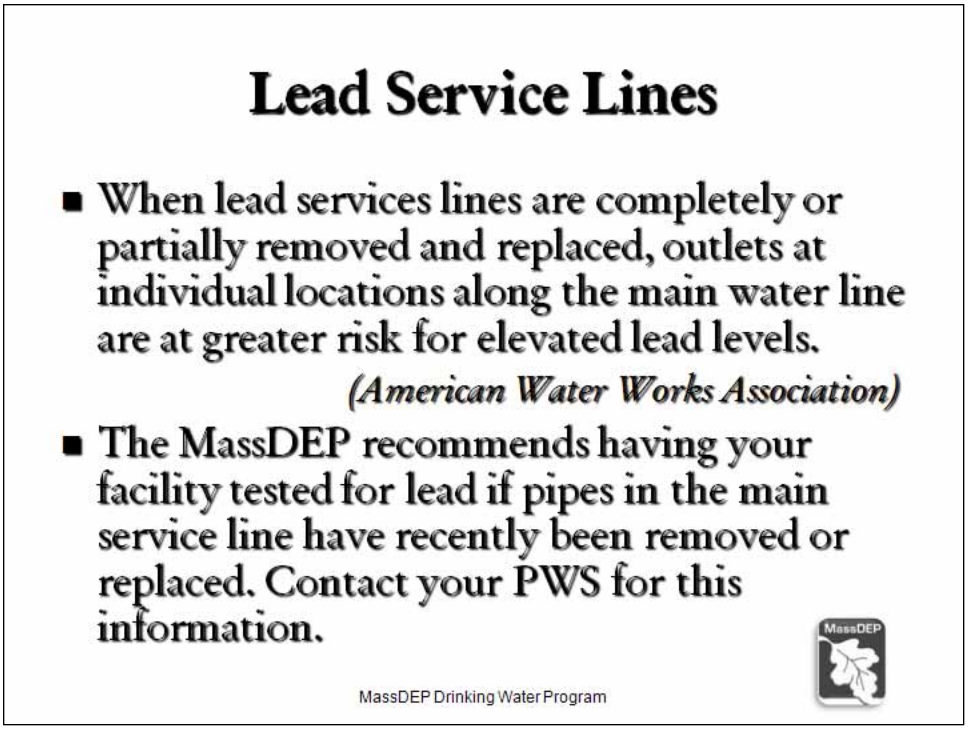
While the water source supplied to schools is generally well below the action level for lead, the internal plumbing system of the building can raise lead levels at the tap. The amount of lead, if any, in a plumbing system will depend on the age of the system and the materials from which the system was constructed. The longer the water is in contact with the pipes, the greater the risk of elevated lead levels at the tap. Lead may be present in various parts of the plumbing system such as old lead solder, brass, fixtures, and lead pipes. Corrosion causes lead to leach into the drinking water supply.



These images from the EPA guidance material show common drinking water fixtures and their basic plumbing configurations—a water cooler, a bubbler, and a cold water faucet or tap.



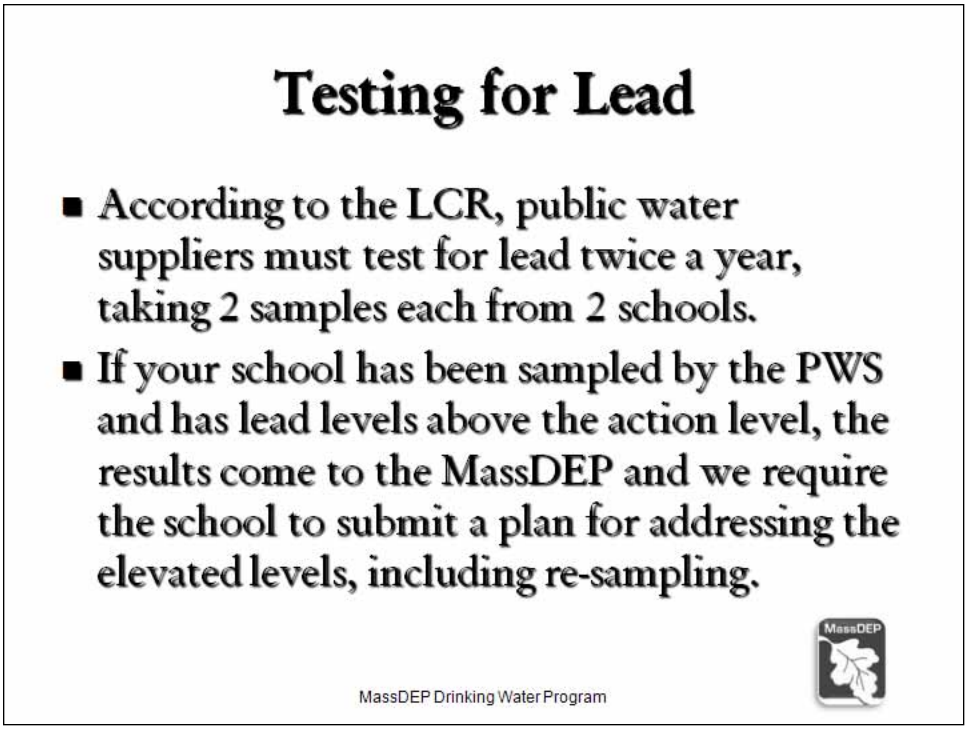
This diagram of potential sources of lead in drinking water shows water service lines coming in from the Public Water Supply main to a school building via a service connection. The internal plumbing system is displayed as an example of what this may look like.



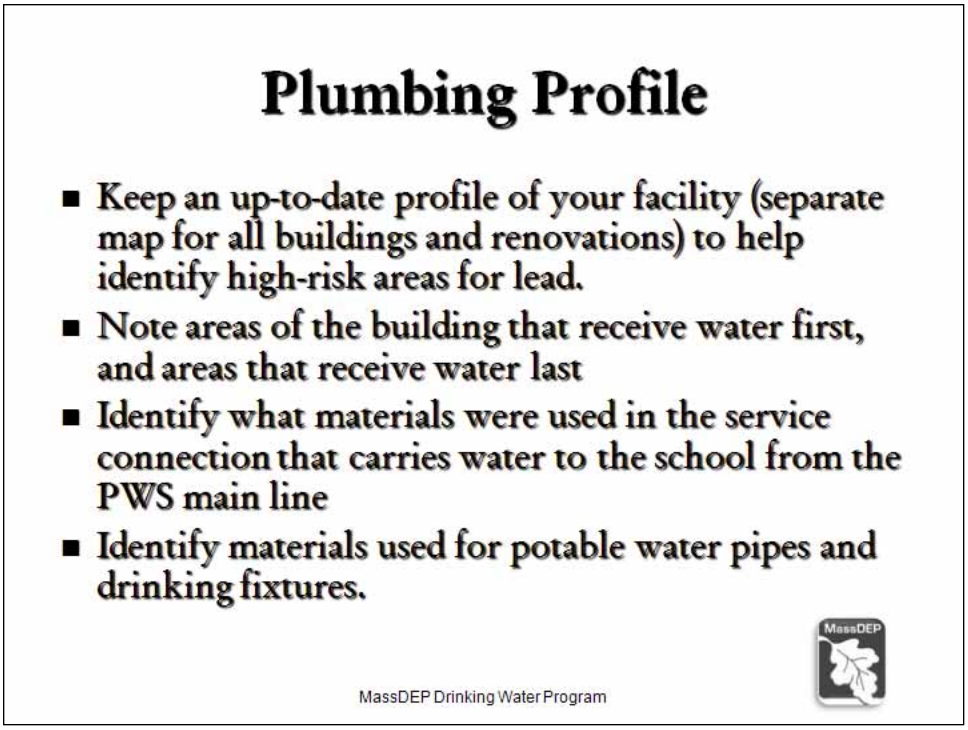
Lead service lines from Public Water suppliers are required to be constructed of lead-free materials. However, as old service lines being removed or replaced may still contain higher levels of lead, their replacement can lead to elevated lead levels at taps and drinking water outlets in buildings connected to the main water line. Therefore if the water service lines connected to your facility have recently been replaced, the MassDEP recommends having your fixtures tested for lead.

If a line was only partially replaced, the segment of pipe privately owned may still contains lead. You should coordinate with PWS to do work at the same time in replacing pipes. Have the lines flushed in the event of a disturbance, as material buildup in the pipe may have come loose and been released into water supply.

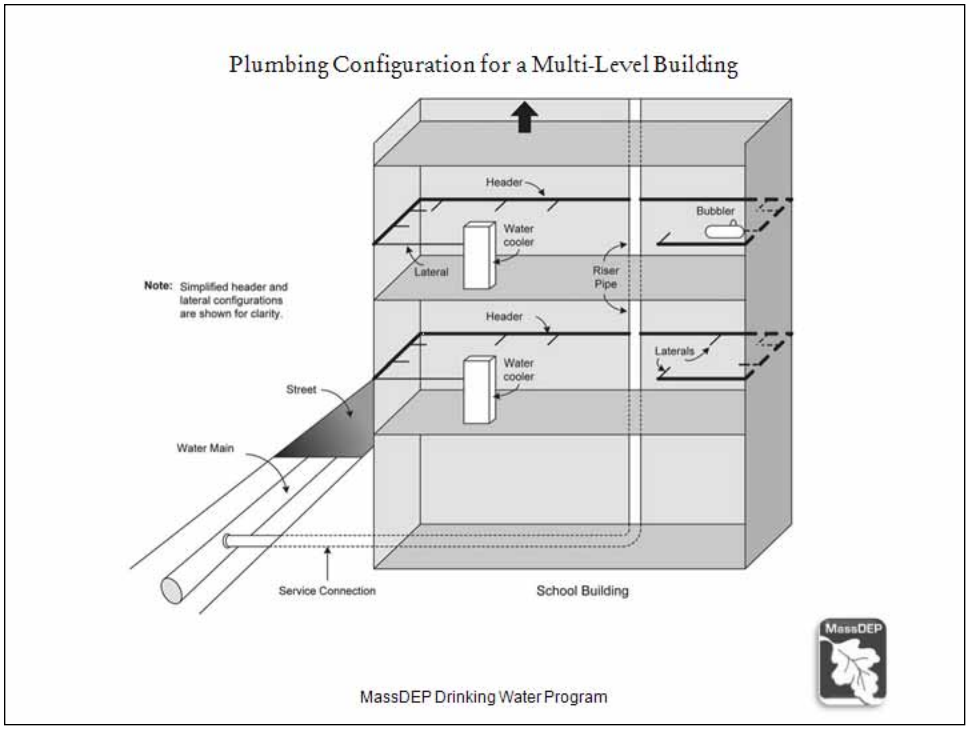
A press release from the Water Research Foundation in June stated that: “The Centers for Disease Control and Prevention recently completed an epidemiological study of the relationship between children’s levels of lead in their blood and lead water service lines. The study results, currently undergoing peer review in a scientific journal, suggest that when lead service lines are partially replaced children are more likely to have BLLs greater than or equal to 10 µg/dl compared to children in houses with either undisturbed lead service lines or service lines not made of lead.”



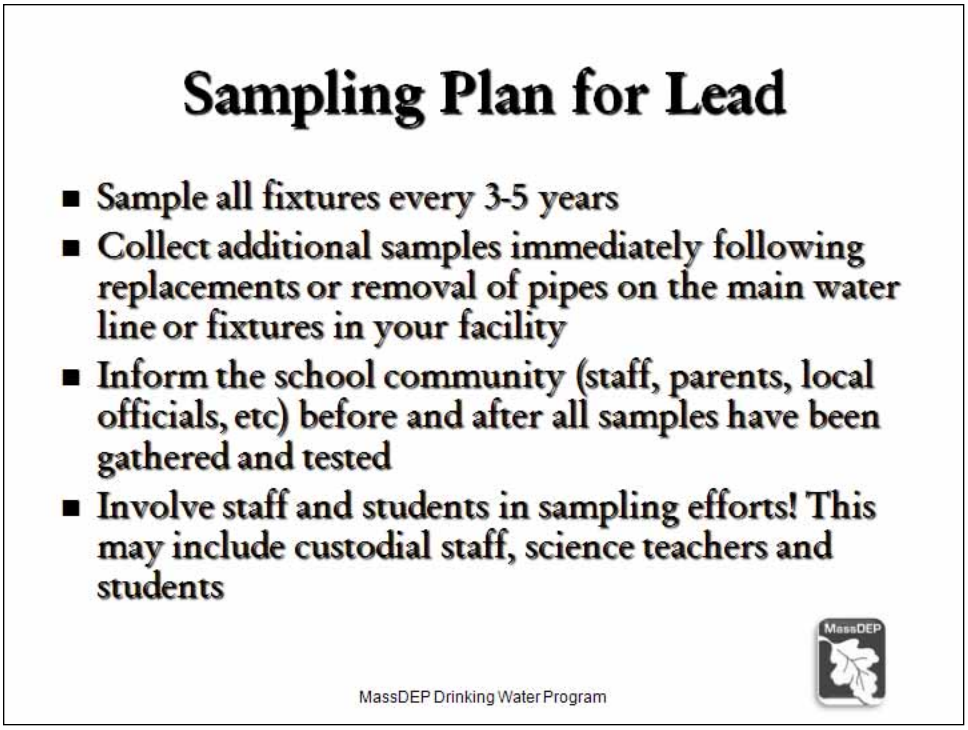
The lead and copper rule requires public water suppliers to test schools for lead every 6 months. Two schools are tested each time, and only 2 outlets are sampled at each. Results are sent to the MassDEP, and if they show elevated lead, the DEP requires the school to submit a plan for addressing elevated levels, including re-sampling. The Lead and Copper Rule applies directly to schools and child care centers that meet the definition of a public water system, meaning you have your own water source that supplies water for at least 25 individuals per day, or you treat or sell the water. If your school is PWS, you must submit samples to the MassDEP every 6 months.



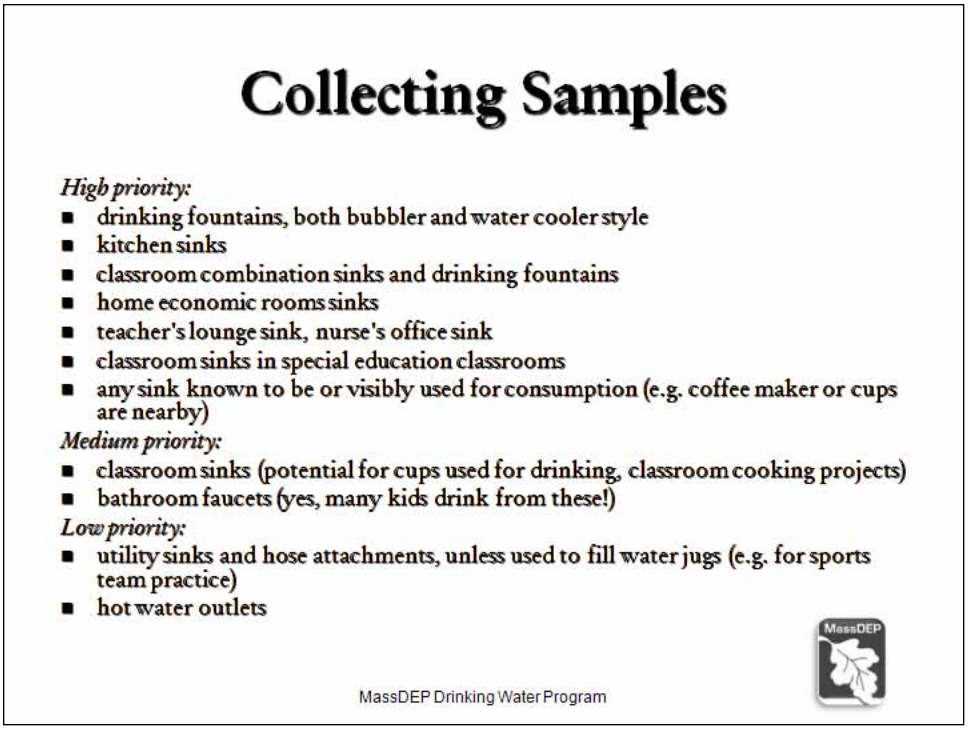
Part of the sampling plan involves keeping a school map or plumbing profile up-to-date with any renovations, additions, or new buildings added at your center. A separate profile should be on hand for each building, with diagrams on a floor-by-floor basis.



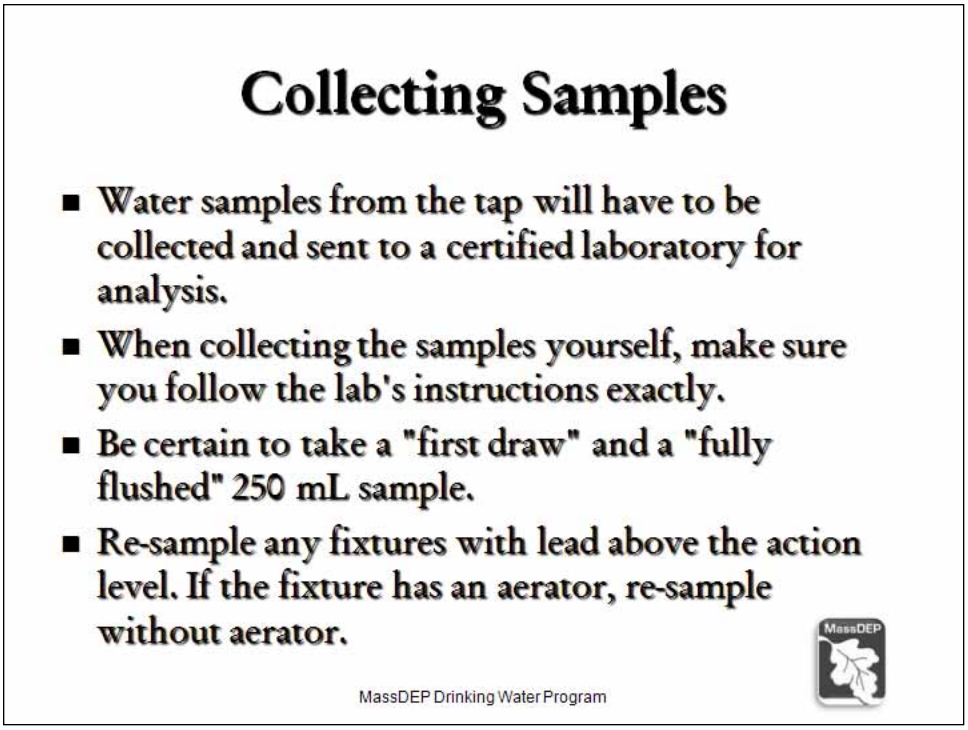
Here is one possible example of a plumbing profile. Yours should include more notes on material of the plumbing fixture and most recent test date for drinking water outlets.



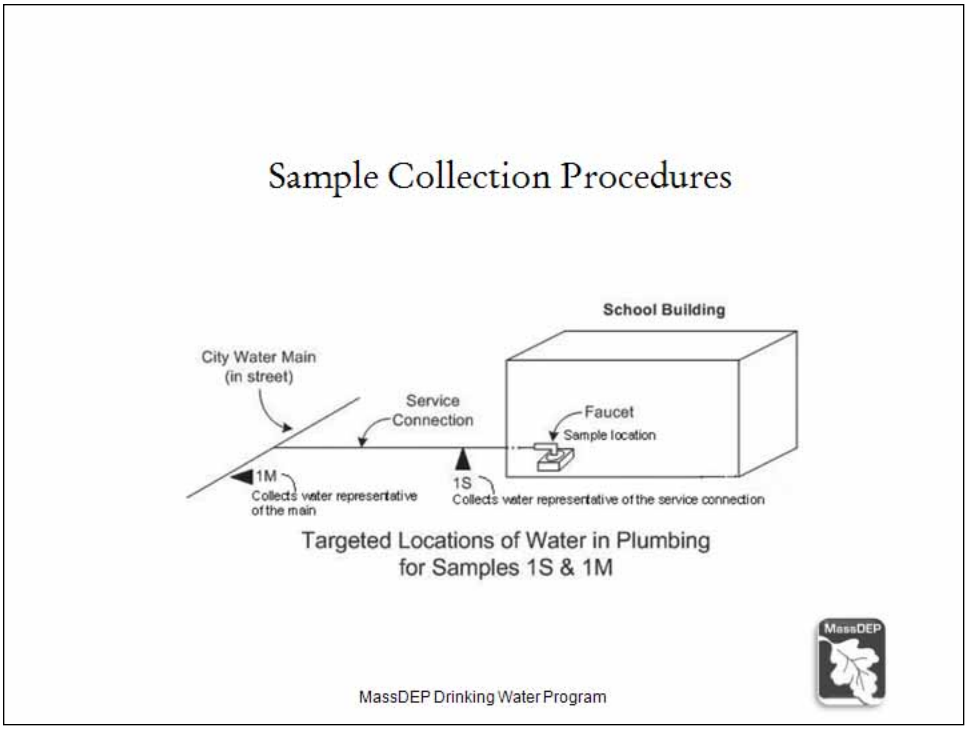
Schools need to develop a sampling plan in addition to the sampling being done by the PWS (they are only hitting a couple of spots as they sample just 2 fixtures, but other fixtures could have elevated lead). It is recommended that your facility test 1/3 of drinking water outlets annually to establish a baseline, and this allows all fixtures to be tested over a period of 3 years. This is a cost-effective and efficient measure. Take control of your efforts to protect the drinking water by involving the custodial staff, students, and teachers in sample collection. The more your school community is aware of lead concerns, the better off it will be.



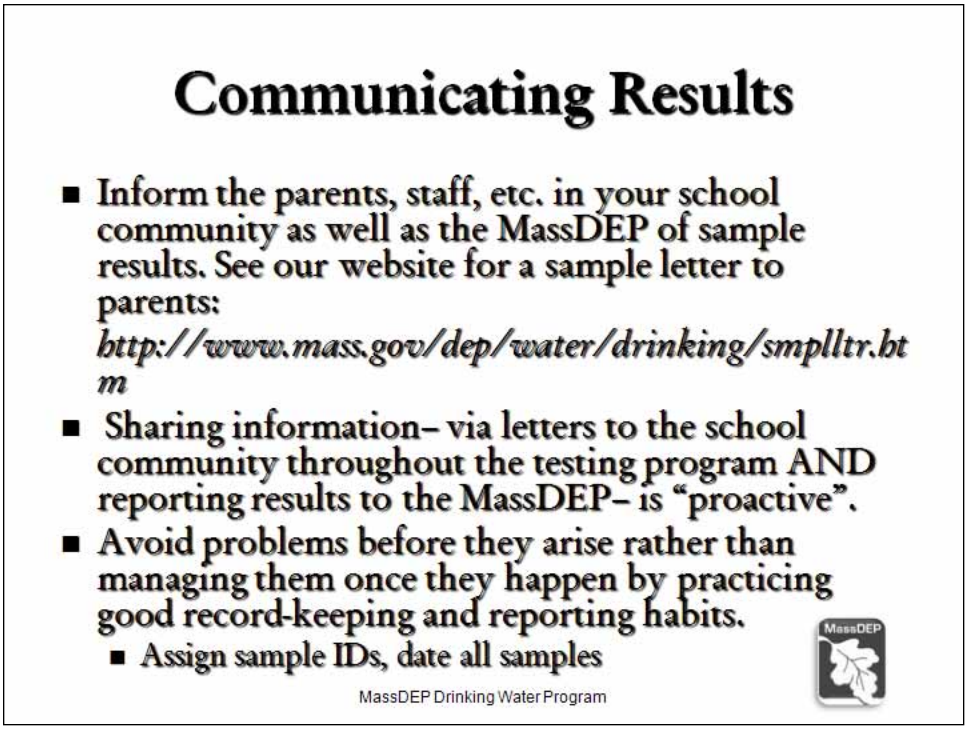
The EPA has identified certain fixtures as high, medium and low priority as shown.



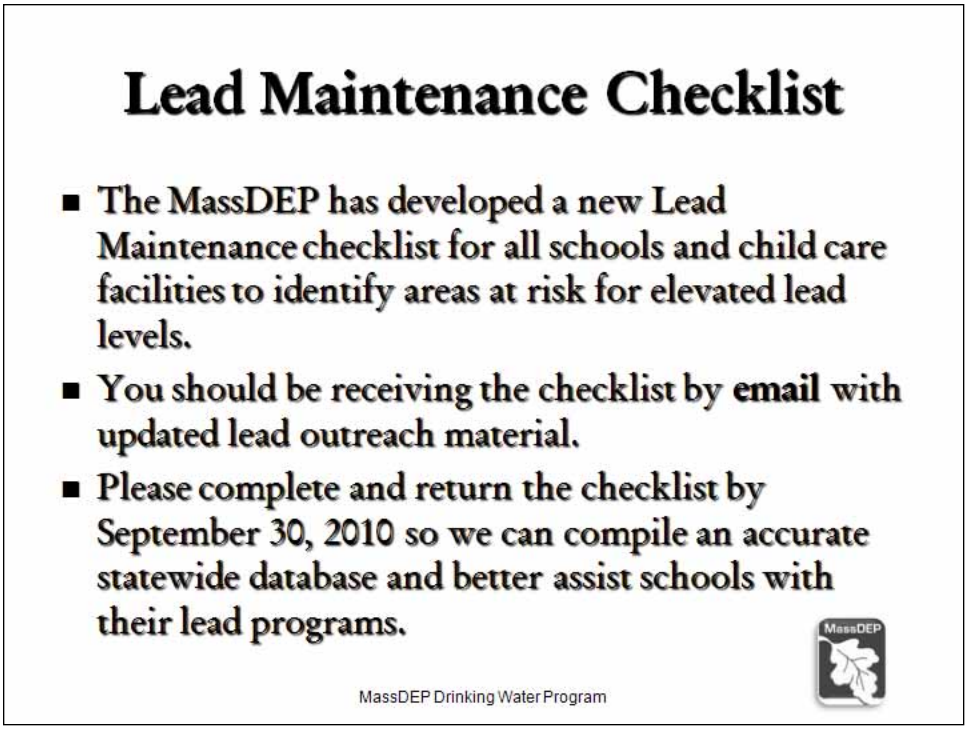
Samples collected should be sent to a qualified laboratory for testing and analysis. You may find a qualified testing company under 'Laboratories' in the yellow pages, or consult the EPA or MassDEP websites for a list of approved testing facilities. When collecting samples yourself, take a first draw sample (ideally on a Monday morning) and a sample after several minutes of flushing. Re-sample any fixtures with lead above the action level. If the fixture has an aerator, re-sample without the aerator.



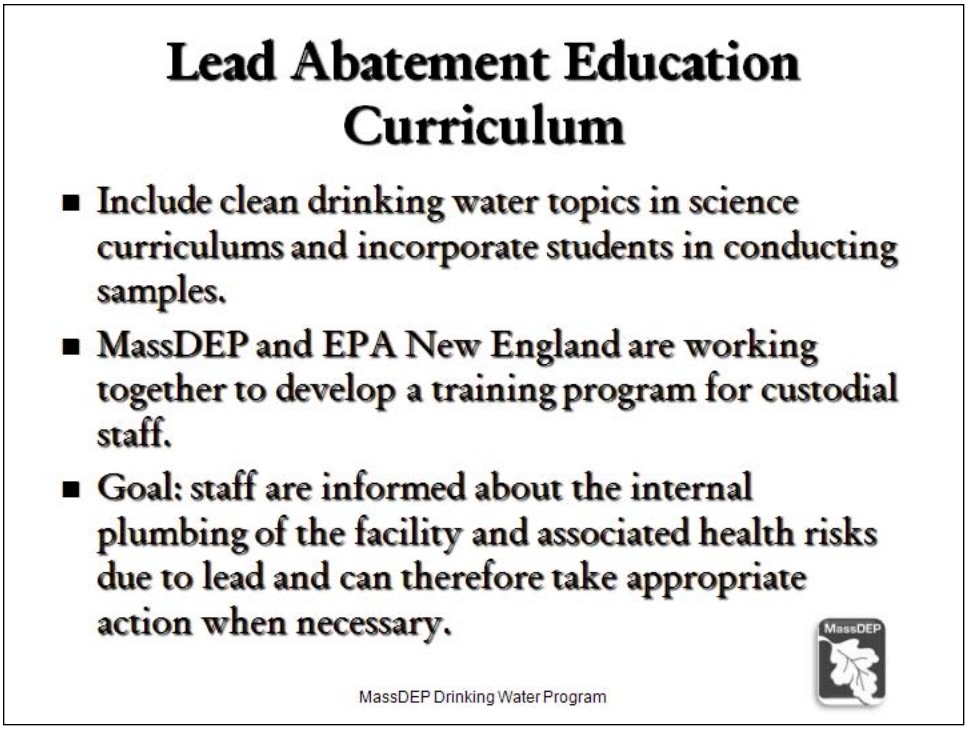
This diagram shows to compare sample results from the main water line to those after the service connection to your building, meaning at the tap.



It is important to share sample results with all affected parties. Sharing information– via letters to the school community throughout the testing program AND reporting results to the MassDEP– is a proactive measure that allows you to avoid problems before they arise. Practice good record-keeping by assigning consistent sample IDs matched to a map of your facility's plumbing.

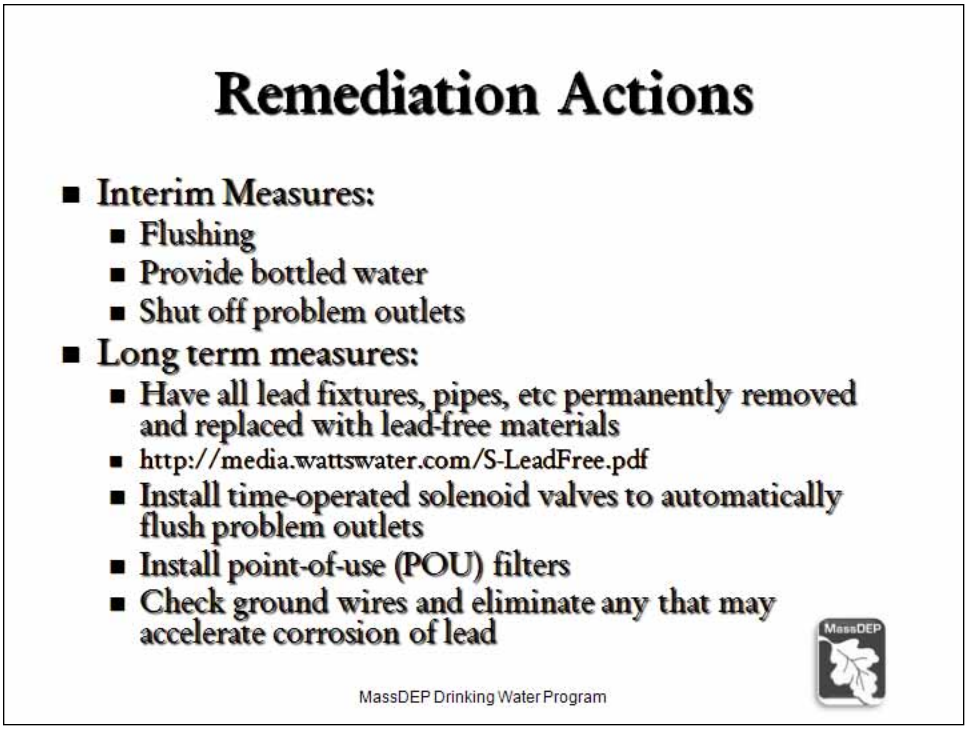


The best way to improve communication between schools and the MassDEP is to complete the updated Lead Maintenance Checklist included in the recent email to all schools and child care facilities. The checklist is based on both EPA plumbing questionnaires and a checklist developed by the Healthy Schools Council in Massachusetts. Please send back the completed checklist by September 30, 2010. It will only take 5-10 minutes of your time, and goes a long way towards improving the Lead in Schools program!

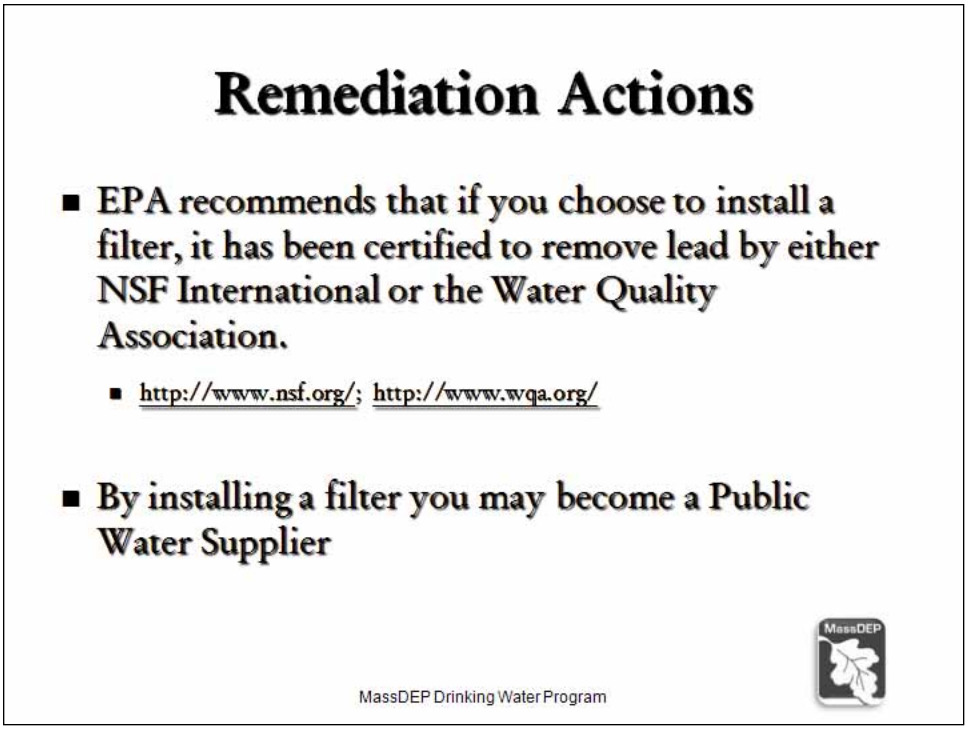


The most recent efforts of the MassDEP and New England EPA office include developing a Lead outreach curriculum for schools to implement into their science programs, and training programs for custodial staff. These two measures encourage a more hands-on approach to learning and safeguarding our drinking water. They will help keep school communities aware of lead concerns and significantly help protect school children from the adverse health risks of lead exposure. Knowledge is power, and being informed about safe drinking water practices will improve the educational climate for all students and faculty.

What should your school do if you get results for lead that exceed the action level? Stop using any fixtures where results were detected immediately, and contact the MassDEP for assistance materials and a remediation plan.



Interim measures for dealing with the problem include flushing, shutting off problem fixtures, and providing bottled water for drinking. However, a long term sustainable solution must be implemented to avoid excessive waste created by bottled water use. This could include installing point-of-use filters or, even better, replacing fixtures with the newest lead-free materials (see Watts Water Technologies website for a complete list of lead free plumbing materials).



If you choose to install a filter at drinking water outlets, follow EPA recommendations and ensure the filter is certified by the National Sanitation Foundation International or the Water Quality Association.

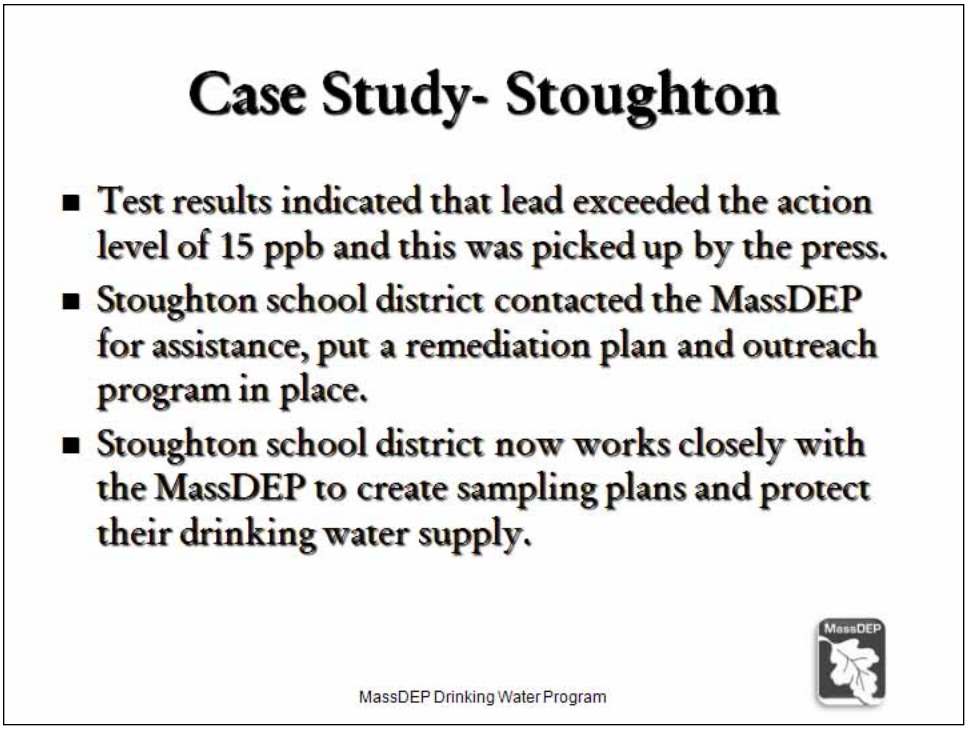
Installation of the treatment system would make the school a public water system (PWS) that would have to comply with the MA drinking water regulations. This would entail obtaining a PWS treatment permit application from MassDEP, hiring a certified operator, and sampling and reporting for more than 80 contaminants. MassDEP estimates the cost of operating a public water system to be approximately $10, 000 per year.

Lead Free Materials

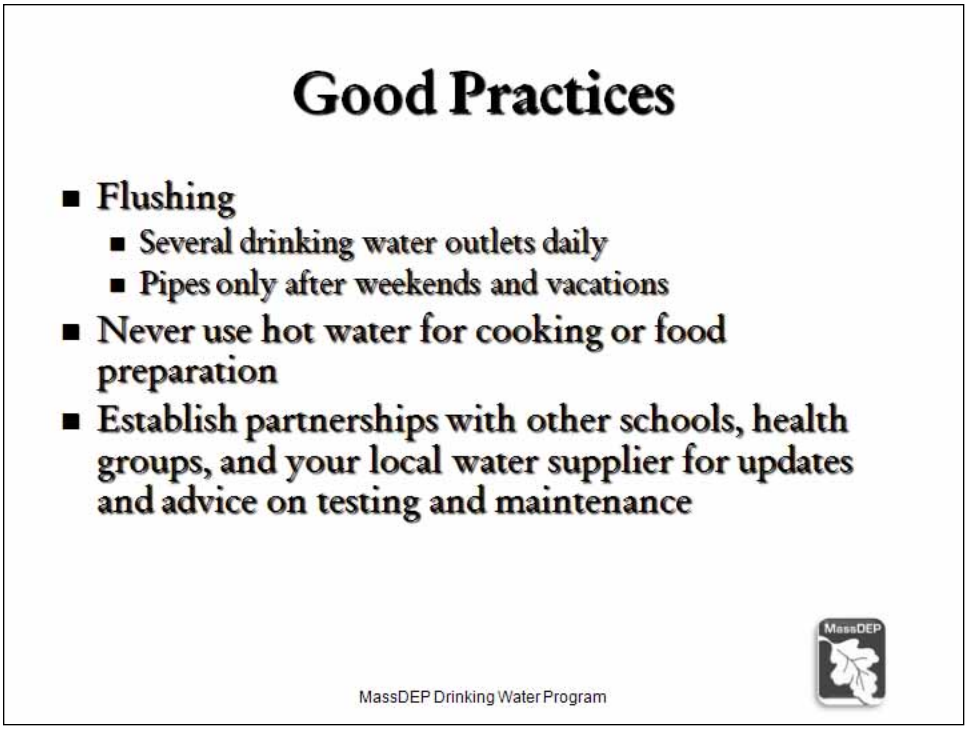
- Additional resources:
  - "We are lead free" website- Home of the Lead Free Plumbing movement, lead free news from around the country and lead free product information:
    - http://www.weareleadfree.net/default.asp
  - Established by Watts Water Technologies
  - Green Plumbers

MassDEP Drinking Water Program

The "We are Lead Free" website created by Watts Water Technologies is an example of embracing the trend towards lowering lead levels to zero in our plumbing materials. The site highlights national and state legislation relating to lead, and provides information on "leadology" and new lead-free materials.



The town of Stoughton is an example of a school system that found elevated lead levels, and once the press got a hold of this information there was great concern among local officials. By contacting the MassDEP for assistance they were able to put a remediation plan in place and communicate with the school community with regards to their efforts. They continue to stay in contact with the MassDEP for sampling plans and guidance.



Good practices for your schools to make a habit of include flushing several drinking water outlets each morning. Pipes need only be flushed after long weekends or vacations. Also, never use hot water for cooking or food preparation. Look to collaborate and form partnerships wherever possible, both within your school and with external groups such as the MassDEP, public health groups, and your Public Water Supplier.

Guidance Material

- EPA's 3Ts (Training, testing, and telling) toolkit for reducing lead in drinking water
  http://www.epa.gov/ogwdw000/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf

MassDEP Drinking Water Program

For more extensive guidance material and references, see the EPA 3Ts Toolkit for reducing lead in school drinking water.

Remember these three basic objectives to guide your updated lead control efforts: use lead free materials, do not use fixtures with elevated lead levels, and send us your completed checklist this fall!