INDOOR AIR QUALITY

INDOOR AIR QUALITY

STRAIGHT TALK FROM THE UFT

SECOND EDITION

INTRODUCTION

The UFT receives more complaints from its members about poor indoor air quality in schools than about any other health and safety issue. Some staff complain about irritation of the nose and throat, dry or itching eyes and asthmatic-type reactions that appear to be caused by something in the air. Others experience headaches, drowsiness and difficulty concentrating.

Many of the problems can be traced to inadequate ventilation or to indoor pollution sources like toxic materials used in shop, art and science classes; photocopy machines that produce ozone; and microbial contamination. Excessive heat and low relative humidity may also play a role.

In most situations, indoor air pollution is not a serious, long-term threat to health, but it can result in significant physical discomfort and interfere with the ability of students to learn and UFT members to do their jobs. In other cases, however, those annoying symptoms could be the tip-off to more threatening air pollution.

In many schools the UFT has been able to recommend air quality improvements that custodians or the board can do quickly and at minimal cost. However, in other schools — particularly those that rely entirely on mechanical ventilating systems and lack windows that open (so-called "closed" or "sealed" schools) — major renovations may be required to fully resolve the air quality problems. For example, at Brandeis High School, a closed school, the renovation work topped $12 million. **NOTE:** In this context, the word "closed" means the windows cannot be opened — it does not mean the school is not in use.

The UFT has lobbied aggressively for more funds to improve air quality in closed buildings. And it continues to lobby for city, state and federal legislation that would set standards for acceptable indoor air quality in schools and other public buildings.

This booklet describes the major sources of indoor air pollution and the measures that can be taken to improve indoor air quality. It also discusses how the UFT can assist school staff to resolve indoor air pollution problems.

CONTENTS

THE PROBLEM DEFINED

Q: *Is indoor air pollution widespread? Can it have a significant impact on health?*

A: The answer to both questions is "yes." Scientists have discovered that the levels of a dozen common pollutants are generally two to five times higher inside buildings than they are outdoors. The potential impact of these pollutants on human health is magnified because most people spend about 90 percent of their time indoors.

The U.S. Occupational Safety and Health Administration (OSHA) estimates that 30 percent of the Americans who work in non-industrial buildings such as offices, schools and hospitals are exposed to poor indoor air quality in their workplaces — without taking into account exposure to tobacco smoke. (Since city law now bans smoking in public buildings, secondhand smoke is no longer a factor in city schools.)

Q: *Are some people more vulnerable to indoor air pollution than others?*

A: Yes. Children are more vulnerable because they breathe in a greater volume of air (including pollutants) relative to their body weight. Other susceptible groups include the elderly and people with asthma and other respiratory problems.

In addition, some people have become very sensitive to certain chemicals as a result of past exposure. They can suffer a wide range of health effects — such as rashes, severe headaches, nausea, dizziness and fatigue — whenever they are exposed to even very low levels of those substances. This condition is often called multiple chemical sensitivity.

Q: *What are the most common sources of indoor air pollution?*

A: The table on the following page identifies some common indoor air pollutants and their sources.

Q: *What is "sick building syndrome"?*

A: Sick building syndrome is the name given to a group of symptoms that appear to be triggered by exposure to poor indoor air quality but neither fit the pattern of any particular illness nor can be traced to any specific exposure source. The symptoms often include headaches, fatigue, nausea, difficulty in concentrating and irritation

STRONG POLLUTANT SOURCES

POLLUTANT SOURCE	CONTAMINANTS PRODUCED
Combustion products released by improperly functioning hot water heaters and boilers; buses and other vehicles idling by windows or air intakes.	Contain carbon monoxide which can cause headaches, nausea, dizziness and is sometimes fatal. Can also produce nitrogen oxides, particulate matter and volatile organic compounds.
Kitchens and rest rooms.	Odors and chemical vapors and gases (from cleaners and disinfectants, for example).
Laboratories and chemical storerooms.	Chemical vapors and gases.
Art rooms.	Chemical vapors and gases and dusts.
Large scale copiers.	**Ozone, heat and toner dust. NOTE:** Most copiers today have ozone filters, so they should not be a significant source of ozone gas, a strong lung irritant.
Vocational shops.	Use of oils, lubricants, cleaners, paints, thinners.
Construction activity.	Dusts, volatile organic compounds, irritant gases.
Pesticides.	Pesticides are toxic and are often mixed with noxious volatile organic compounds.
Biological organisms including molds, bacteria, insects, rodents and dust mites.	These organisms produce contaminants called bioaerosols — which, when inhaled, can cause allergic reactions.

of the eyes, nose, throat and skin. Usually, those affected feel better soon after they leave the building.

Generally, sick building syndrome strikes people who work in buildings where there are problems with the design, operation and maintenance of the ventilation system, the supply of outside air, preventive maintenance and/or housekeeping.

Q: *What does the term "building-related illness" mean?*

A: In contrast to sick building syndrome, building-related illness is the term used when symptoms of a diagnosable illness can be identified and attributed directly to contaminants in a building's air. The classic example is *legionellosis*, popularly known as Legionnaire's disease). This bacterial infection — caused by the *legionella pneumophila* bacteria — got its name when many people attending an American Legion convention in a Philadelphia hotel became sick. The hotel stopped recurrences by cleaning and improving the water system where the bacteria had grown.

Legionella pneumophila grows in poorly maintained warm or tepid water systems including cooling towers, hot water pipes and tanks, or humidifiers. Persons may become infected when highly contaminated water droplets become airborne and are inhaled. Some people have contracted Legionnaire's as a result of a short-duration exposure, but the risk of infection increases if the contaminated droplets are breathed in over extended time periods. Proper cleaning and sanitizing of building water systems prevent the growth of *legionella*.

Another building-related illness is *hypersensitivity pneumonitis*, which is associated with exposure either to "bioaerosols" that flourish in moist areas or to pests such as rodents and cockroaches and/or their excreta. Bioaerosols are airborne biological contaminants that are, were or came from living organisms like bacteria, viruses, fungi, molds, pollen and animal dander and insect waste. Those could possibly pose problems in a school among sensitive persons.

GOVERNMENT STANDARDS

Q: *Are there any government standards for indoor air quality that can be used to protect school employees and students?*

A: The New York City building code requires mechanical ventilation for indoor spaces with no windows or windows that don't open (for interior spaces that have win-

dows that do not open). The Building Code also specifies the amount of outside air per building occupant that mechanical ventilation must supply – 15 cubic feet of outside air per minute (cfm) per person. So if you have 30 people in an interior classroom, the ventilation system must provide 450 cfm of outside air (30 people x 15 cfm) throughout the time the space is occupied.

One way to indirectly evaluate outside air supplies is to measure carbon dioxide levels indoors. Carbon dioxide is a product of human respiration (exhaled breath) and can build up in rooms which are underventilated or overcrowded.

A carbon dioxide level of 1000 ppm (parts per million) is equivalent to 15 cfm of outside air per person.

When carbon dioxide levels exceed 1000 ppm, it usually means the rooms are not receiving enough outside air for the number of occupants.

Because these building code requirements deal primarily with comfort issues rather than fire and life safety issues (for example, blocked exits), they are more difficult to enforce.

The building code also sets requirements for the amount of functioning window space per square foot – so that one window in a classroom is not sufficient. The code does not address air quality problems that arise from specific activities within schools (e.g., no standards for local exhaust ventilation in art classes) and sets no standards for the maintenance of mechanical ventilation systems.

There are no local, state, or federal indoor air quality standards.

IMPROVING INDOOR AIR QUALITY

Q: *What can be done to improve indoor air quality?*

A: Improving indoor air quality generally requires a two-pronged approach: proper ventilation and pollution prevention.

To be properly ventilated, a building must have a reliable supply of outside air that is sufficient for the number of building occupants, and that air must be properly distributed throughout the building. Any chemical and biological contaminants indoors will increase in concentration unless air is brought in from outside to dilute them.

Q: *How can poor ventilation be improved?*

A: Providing adequate outside air in a building that has a mechanical ventilation system may require relatively simple changes in operation and maintenance, or it may require major renovations if the system is not adequate to meet the building's needs. In a building without mechanical ventilation, keeping the windows open, or opening them periodically in the winter, can regulate the supply of outside air.

For specialized activities that generate toxic pollutants — such as the use of ceramic kilns, airbrush painting techniques or photographic developing equipment — local exhaust equipment vented directly to the outside should be provided to prevent contaminants from entering the room and being circulated throughout the building.

Q: *What about pollution prevention?*

A: Although better ventilation will improve air quality, it also is essential to eliminate or minimize any sources of hazardous pollution in the building. Measures that prevent pollution at the source include:

- Selecting non-toxic or less toxic materials for use in shop and art classes.
- Choosing pest control techniques that minimize exposure to toxic chemicals.
- Selecting building materials and furnishings that emit the smallest possible amount of airborne contaminants.
- Banning indoor smoking in public buildings, as New York City has done.

It is also important for the custodian to implement and maintain a preventive maintenance program for the building and for all who use the school to maintain good housekeeping practices. The building maintenance program should also include controlling water leaks and infiltration and removing water-damaged and moldy carpeting, paper, books, plaster, sheetrock or other porous materials.

VENTILATION PROBLEMS IN CLOSED SCHOOLS

Q: *Is ventilation a problem in the New York City school system?*

A: Yes, particularly in the approximately 50 "closed" buildings that lack operable windows and depend entirely on mechanical ventilation. It's also a problem in many of the nearly 1,100 other schools that rely primarily on open windows for ventilation. Of course, it is also a problem when staff must utilize rooms or spaces that were never designed to be occupied (e.g., bathrooms, storage closets, etc.).

Q: *Why did the board build schools with windows that can't open?*

A: To save money on heating and cooling. During the energy crisis of the 1970s, many buildings throughout the United States were designed without operable windows and with ventilation systems that limit the intake of outside air and increase the percentage of recirculated air. Since it is expensive to heat outside air before circulating it in winter (or to cool it in summer), minimizing intake lowers operating costs. Eliminating operable windows allows air intake to be controlled by a mechanical ventilation system without any interference by building users.

Experience demonstrated that closed buildings resulted in serious air quality problems. To combat them, the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE standard 62 – 1999) recommends supplying outside air so that carbon dioxide levels are maintained at concentrations below the sum of 700 ppm plus the outdoor carbon dioxide level (300 to 400 ppm). That comes close to the 1000 ppm corresponding to the NYC Building Code's outside air requirements.

Q: *What types of ventilation problems are found in closed buildings?*

A: The key problem is a lack of adequate outside air. Recirculating air already in the building, instead of bringing in some new air from outside, allows whatever indoor pollutants are present to increase in concentration.

Air quality problems also may develop when large rooms are subdivided to create more classrooms if the new spaces don't have sufficient windows or vents for incoming and outgoing air. Poor maintenance — including a failure to change air filters frequently enough — is another source of poor air quality.

Q: *What can be done about such problems?*

A: Proper maintenance is always important. In addition, in some closed buildings, the ventilation equipment can be adjusted to increase outside air intake. At one intermediate school, for example, staff comfort improved dramatically after the UFT convinced the Board of Education to direct the custodian to provide as much outside air as possible during the cold, dry months. (The board also replaced broken thermostats throughout the building.)

In other closed buildings, however, especially those operating far above the designed student capacity, the ventilation system lacks the ability to supply sufficient outside air. In such buildings, improving air quality may require major reconstruction, which is very expensive. Of course, reducing class size is another way to improve indoor air quality. Fewer people in a room means less exhaled carbon dioxide and thus more outside air.

Q: *Are capital funds available for ventilation work?*

A: Although the UFT has secured some funds to improve air quality, billions of dollars are necessary to improve air quality and make our schools habitable in other ways as well. However, the city's capital budget contains only a fraction of the money necessary. The UFT continues to seek additional funds for school repair and maintenance.

Q: *If improvements in ventilation are not feasible, can anything else be done to make air quality better in closed buildings?*

A: Yes. The comfort and health of building occupants can be protected by identifying and controlling specific source pollutants such as copy machines, toxic materials used in shop and art classes and molds that proliferate in damp areas. These problems are discussed later.

Q: *Has the UFT done anything to prevent construction of closed buildings in the future?*

A: Yes. The union secured a commitment from the Board of Education that all newly constructed schools will have operable windows and well-designed ventilation systems.

VENTILATION PROBLEMS IN SCHOOLS WITH WINDOWS

Q: *What about schools with windows? Do they have ventilation problems?*

A: Most schools rely on windows to provide) an adequate supply of outside air. Although they do not have sophisticated mechanical ventilation equipment, these buildings sometimes have a simple return air system that draws warm exhaust air into a vent and up to the roof, clearing the way for replacement air to enter the building through the windows.

When windows are broken and can't be opened, or when people close them to shut out cold air, students and staff may experience headaches, drowsiness and other sick building symptoms.

Q: *How can ventilation be improved?*

A: If the windows work, staff should open them periodically to air out their rooms even if it's too cold in the

winter to keep them open all of the time. Try opening the windows two to four inches at the top and bottom every few hours for about 15 minutes. Letting in outside air will reduce the concentration of any pollutants that have accumulated.

In many schools, furniture or other obstacles block the return air or exhaust vents. It is important to locate and clear these grilles, which are often found along the front wall of the classroom or in the wardrobe. You can determine if the return air system is operating properly by holding a piece of paper or tissue across the vent; it should be pulled gently toward the grate. If there are problems, consult your UFT chapter leader.

TEMPERATURE AND RELATIVE HUMIDITY

Q: *How do temperature and relative humidity affect the health and comfort of school staff and students?*

A: During the months when schools are artificially heated and many rooms become too hot and dry (indicating low relative humidity), some staff and students experience symptoms similar to those associated with sick building syndrome. These may include eye irritation, dry nose and throat, and even nose bleeds. There is some evidence that low relative humidity also may be associated with reduced resistance to colds and flu.

The American Society of Heating, Refrigerating and Air Conditioning Engineers recommends that in winter indoor temperatures be maintained between 68 and 76 degrees Fahrenheit, and in summer indoor temperatures be maintained between 73 and 80 degrees Fahrenheit. Relative humidity levels should be maintained between 30 and 60 percent. (Relative humidity is a ratio that compares the amount of water vapor in the air to the maximum amount of moisture the air could hold at a particular temperature.)

If your classroom or work area does not have its own thermostat, you can help to regulate both temperature and humidity by periodically opening windows during the heating season as described earlier. Unless the outside air is unusually dry, this will help to increase the relative humidity while lowering the room temperature. The higher the room temperature during heating season, the lower the relative humidity level and the more uncomfortable you will probably be. Maintaining room temperatures below 76 degrees Fahrenheit will help to maintain more comfortable humidity levels.

COPYING EQUIPMENT

Q: *What about photocopy machines? Do they pollute the air?*

A: They can. Photocopiers emit hot, dry air and sometimes toner dust. In addition, the high temperatures at which many copiers operate may cause the toner to decompose into products that are respiratory irritants. Most copiers today have ozone filters installed, so copiers should not be a significant source of ozone gas, a strong lung irritant.

The UFT recommends that photocopiers be kept in large, well-ventilated rooms, rather than small, enclosed ones, especially if some staff spend long periods of time operating the equipment. If space permits, the copiers should be located near windows or exhaust vents and as far as possible from staff desks. Be sure to open windows periodically to improve ventilation, even in winter.

Q: *What about ditto machines?*

A: Old-fashioned duplicating machines that produce copies (dittos or rexos) from a stencil or spirit master are still used in many schools. In the past, these machines presented a significant health hazard because the duplicating fluid contained high concentrations of methanol.

Exposure to methanol (also called methyl alcohol) is associated with headaches, dizziness, nausea, blurred vision and skin problems. The long-term effects of exposure have not been adequately researched, but there is concern that methanol may have adverse affects on the human reproductive system.

Q: *What is being done to protect school staff from exposure to methanol?*

A: Fortunately, the UFT has made substantial progress in curbing this hazard. As a result of UFT pressure, the Board of Education now purchases and distributes only low-level (5 percent) methanol duplicating fluid. At the UFT's request, the board also sent a letter to all principals informing them of the hazards of duplicating fluid and the importance of adequate ventilation even when using the much less hazardous, low-level methanol product.

To further reduce exposure to methanol, staff should allow dittos to dry before handling or distributing them. This is important because methanol can be absorbed through the skin and can be inhaled as methanol evaporates during the drying process.

PESTICIDES

Q: *Does exposure to pesticides in schools pose a health threat to students and staff?*

A: No. At one time, the only defense against the health risks associated with insect and rodent infestations was extensive application of chemicals that were potentially hazardous to humans as well as vermin. But human exposure to pesticides is no longer a significant problem in the New York City schools.

Q: *Why are pesticides no longer a problem?*

A: Since September 2000, the board's Office of School Food and Nutrition Services (OSFNS) has not used concentrated pesticides.

Q: *Does it use concentrated pesticides anywhere around schools?*

A: Not in classrooms. However, OSFNS does use wetable powders in certain areas such as the perimeter of a school or in the food service area. During the 1999-2000 school year, it reported using a total of 32 pounds for the entire school system, an amount that works out to 1 gram per school per month.

Q: *So how does the board control pests?*

A: With a combination of modern techniques known as "integrated pest management," which minimizes human exposure to toxic substances. Integrated pest management includes:

Using monitoring devices like glue boards for roaches and rodents to identify problem areas before a major infestation occurs.

Eradicating pests with control agents that are minimally toxic to humans and are applied in a manner that poses no health risk. For example, a very mild enzyme-based soap sprayed onto bugs will kill all pheromones (the sex chemicals creatures exude). This product is also used as a children's shampoo for getting rid of lice without using a chemical product.

Cleaning infested areas to remove residues of excreta and biologically derived dust to prevent allergy-related symptoms.

Q: *Will the board ever use pesticides in the classroom?*

A: Only under extreme circumstances. In keeping with its least toxic/least impact policy, OSFNS says it would not resort to spraying a classroom unless there were an acute health hazard from a pest species, like fleas or ticks, for which non-aerosol control agents have not yet been developed. In such a situation, the least toxic spray would be selected and applied when the classroom was not occupied in order to minimize exposure to staff and students.

Q: *What else does OSFNS do to control pests?*

A: It encourages schools to take steps that can prevent the development of pest problems in the first place and, thus, further reduce the need for chemical treatment. For example, OSFNS is installing equipment in newly designed kitchens to help reduce pest problems, including power washers and refrigerated rooms for the storage of recycled food or garbage.

Prevention requires eliminating the conditions that attract and sustain vermin. This can include stringent sanitation (e.g., use of tightly covered garbage cans for food refuse) and vigilant building maintenance (e.g., sealing cracks in walls and preventing moisture accumulation). While ideal conditions are not always attainable, the pest control staff recommends appropriate measures to the custodial staff. Other staff and students can help by keeping classrooms free of food waste and avoiding use of project materials that may attract pests.

Q: *What advice do you have for teachers whose students eat in their rooms, such as in pre-K and kindergarten?*

A: We recommend using foot-operated, covered, lined garbage containers in rooms where food must be consumed.

Q: *Can't I just get a can of insecticide to zap any bugs I see in my classroom?*

A: Please don't. Staff (including custodial staff) should never try to treat a pest problem on their own with over-the-counter pesticide sprays; these may be hazardous to children and adults. Ask your chapter leader to notify the custodian, who will contact the board's pest control experts.

Q: *You've described what sounds like a perfect system. Are you really saying there are no more problems with insects or rats in any schools?*

A: No. There certainly are schools that still have problems. And since cockroaches have been on this planet longer than humans, it seems inevitable that we'll always have some pests. Please report any problems to your chapter leader.

Q: *I have seen mothballs in a number of classrooms*

with rodent problems. Is that safe?

A: Mothballs should never be used in school settings. Mothballs contain toxic ingredients which evaporate into the air. Report any rodent infestations to your chapter leader.

VOCATIONAL AND ART CLASSES

Q: *Do vocational/technical classes pose special indoor air quality problems?*

A: Yes, often they do. Classes in woodworking, photography, printing, auto repair and other vocational/technical subjects often employ processes and materials that release chemical contaminants into the air, posing a threat to the health of staff and students.

For example:

- Students in woodworking classes are exposed to formaldehyde vapors from adhesives used in plywood and particle board. Exposure to formaldehyde can irritate the respiratory system. It also causes cancer in animals and may cause cancer in humans.
- Woodworking students may also use paints, stains, finishes and other toxic materials and often are exposed to large quantities of wood dust, another respiratory irritant.
- Exposure to photographic chemicals can precipitate asthma attacks in sensitive people and result in chronic respiratory problems, dermatitis and other health effects.
- Printing inks contain toxic solvents and pigments.
- Without appropriate protective equipment, repair work on auto brakes may release microscopic asbestos fibers.
- Students in auto repair shops also may be exposed to high levels of carbon monoxide when they run car engines unless the work area is equipped with a local exhaust system.

Q: *What should be done to address these problems?*

A: Vocational/technical classrooms should contain appropriate local exhaust equipment vented directly to the outside air, and the board should train teachers to minimize hazards through the selection of the least toxic supplies and the proper use of appropriate safety procedures and equipment. The union is seeing to it that the necessary training is offered.

Q: *What else has the UFT done to protect staff and students in vocational/technical classes?*

A: The union secured a commitment from the Board of Education Division of School Facilities to design and install dedicated ventilation equipment for shops and science laboratories when modernizing a building.

To ensure that vocational/technical teachers are informed about environmental health hazards in their shops and about steps they can take to protect themselves and their students, the UFT has joined with the board to sponsor "right-to-know" training workshops.

Q: *What do you mean by "right-to-know" training?*

A: Under the state's Right-to-Know Law, employers must ensure that staff members know about the hazards of materials that they work with, how to protect themselves from danger and how to cope with exposure if it occurs. Training must be conducted annually and explanatory material, such as chemical fact sheets (also known as material safety data sheets), must be readily available.

Q: *What about art classes? Is indoor air pollution a problem?*

A: It can be. Gases from nitric acid etching, dust from clay, solvent vapors from permanent markers, rubber cement, oil and alkyd paints, solvent-based inks and solvent-based clean-up materials may be hazardous when inhaled in sufficient quantities.

Q: *What should be done to protect students and teachers in art classes?*

A: Be sure to use only non-toxic materials in elementary schools. They're labeled with either the AP [approved product (non-toxic)] or CP [certified product (non-toxic)] seal or carry the statement "conforms to ASTM D-4236 or the equivalent." All art materials that present hazards must carry a statement that such materials are inappropriate for children.

Q: *What about more advanced classes?*

A: In junior and senior high schools, teachers should strive to substitute safe or less toxic materials for more hazardous ones whenever possible. This can be done, for example, by using water-based materials rather than solvent-based ones. When hazardous materials are used in the upper grades — even if the materials are less toxic than those previously employed — it is essential to follow appropriate safety precautions. These precautions, which

vary with the type of materials used, may include the use of protective clothing (such as gloves and aprons) and safe work practices, which include safe storage and handling and proper clean-up of art materials. Special ventilation systems, such as a spray booth or hood, may also need to be installed to capture and exhaust pollutants to the outside before they contaminate the classroom air.

Q: *What should I do if I don't know what safety procedures are required for materials used in my classroom?*

A: Don't use the materials until you find out. The basic safety procedures should be described on the product warning label. More detailed information, which often is necessary, can be obtained from the material safety data sheet (MSDS) that the manufacturer is required to provide with the product.

You can ask your principal or site safety officer for the MSDS; by law, the Board of Education is required to make it available to you. If the school does not have the information, the union's Health and Safety Committee can help you get it. You can contact the committee through your UFT chapter leader or district representative.

Q: *Can you describe some situations in which special safety precautions are required in art classrooms?*

A: A spray booth should be used when spraying ceramic glazes or air brushing with paints. Aerosol spray fixatives should only be used outdoors or in an explosion-proof spray booth.

Dilution ventilation — such as a window exhaust fan — should be employed when using materials such as small amounts of rubber cement or permanent markers as used in commercial/graphic art processes to control solvent vapors.

SCIENCE ROOMS AND LABORATORIES

Q: *What about science rooms and laboratories?*

A: To address air quality and other hazards in science classrooms, the UFT conducts annual health and safety training and prepares written materials on the training topics. The union also meets regularly with the Board of Education to address safety issues. Both the teacher and lab specialist contracts call for a Science Experiment Review Panel to consider disputes raised by staff members concerned about the safety and efficacy of scientific procedures and experiments in schools. As noted earlier, science laboratories in new buildings will have appropriately vented equipment as a result of UFT pressure on the board.

Q: *What has the UFT done to improve laboratory safety?*

A: Under a grant from the New York State Department Of Labor (NYSDOL), the UFT inspected laboratory facilities in 75 schools between 1998 and 2000. The inspection findings were summarized by school, borough and citywide after which the union met with the board to discuss appropriate responses. As a result:

- The board's Division Of School Facilities (DSF) has been systematically correcting the lab facility deficiencies.
- The board's Office Of Occupational Safety And Health (OOSH) has been systematically addressing health and safety program deficiencies.
- The board's Bureau Of Supplies (BOS) has modified its chemical purchasing procedures so that it is possible to order smaller quantities of chemicals.
- The union also reviewed the board's blueprint specifications and made recommendations for additional fire extinguishers, flammable storage cabinets, corrosive chemical storage cabinets, chemical storerooms, safety showers, and ground-fault circuit interrupters.
- In addition, when the Board of Education failed to provide legally required right-to-know and lab standard training for laboratory specialists, the UFT set up its own training workshops.
- In 1995, the union also filed a complaint with the state labor department, which found the board in violation of the right-to-know and lab standard regulations.

AIR QUALITY DURING RENOVATION WORK

Q: *Our school has been lucky enough to be scheduled for some renovation work, but we are concerned about possible exposure to hazards during construction. What has the UFT done to protect us?*

A: The UFT negotiated a provision in our contract requiring that a safety "protocol" be written to spell out how work will be done in each occupied school. The protocol requires that a "job committee" be established to oversee every renovation job and that a meeting be held prior to the commencement of any renovation work. That

committee includes the UFT chapter leader or designee, the custodian, a representative of the school administration, a parent association representative and the on-site construction superintendent. The chapter leader should hold a protocol meeting before any work begins and then meet regularly to ensure that the renovation is being conducted safely and without significant disruption to education. If problems occur during work, the union dispatches its health and safety experts and its industrial hygienists to solve them. If danger is imminent, the union will not hesitate to close the school.

The UFT provides chapter leaders with a renovation "check list" to assist them in monitoring renovation work and provide technical assistance when needed. Chapter leaders should inform members about the progress of the renovation work and report members' complaints at the meetings.

Q: *What precautions should the Board of Education take to protect building occupants during such renovation work?*

A: Under the protocol that the union negotiated, the board and School Construction Authority (SCA) can require contractors to protect air quality by measures such as:

- Isolating work areas with temporary barriers that prevent dust and debris from contaminating non-work areas. This includes sealing the ventilation ducts so respirable dust is not circulated throughout the building.
- Using renovation procedures that minimize dust creation. For example, all grinders for pointing and grinding work must be equipped with high-efficiency particulate air (HEPA) vacuum attachments to collect the dust and particulates.
- Selecting the least toxic paints, paint strippers and sealers.
- Following the SCA welding protocol when using acetylene and propane torches or confining such work to after-school hours.
- Whenever possible, interior renovation work and roof repair should be scheduled during hours when schools are not occupied.

Q: *What about lead and asbestos removal or work that disturbs those materials? Are special procedures required?*

A: Yes. When lead paint or asbestos materials are disturbed or removed, contractors must follow safety procedures required by city, state and federal laws. Particularly stringent dust control and isolation techniques are required along with specialized clean-up procedures. For lead paint work, contractors should follow the guidelines in the "Report on Lead-Based Paint: Policy Recommendations" by the Chancellor's Task Force on Lead, in which the UFT played a leading role. The UFT enforces the lead and asbestos requirements through the job committee process described above.

Q: *How can I get more information about lead paint and asbestos?*

A: Ask your chapter leader to provide you with copies of the booklets on lead and asbestos, which are part of this "Straight Talk" series.

Q: *Sometimes when we arrive at school, we notice dusty rooms or areas. We're told maintenance, repair or renovation work was conducted. Shouldn't the dust have been removed before we reported and how do we know it's safe to go inside?*

A: Yes, the dust should have been cleaned up. As for whether it's safe to enter the building or room, you should check with your UFT chapter leader to find out what was done and to register a complaint that a possibly hazardous mess was left behind.

Q: *Are there any rules about how work should be conducted?*

A: Absolutely – and the union secured them to protect staff and students.

As a result of the union's efforts and pressure, the Board of Education's Division of School Facilities issued dust control procedures and standard operating procedures to control dust and/or debris. They specify how workers are supposed to prepare work areas, conduct the work and clean up after any activities that generate dust. These procedures apply to all board personnel. Including custodial staff, as well as contractors and subcontractors – in fact, anyone who will disturb any building material or painted surfaces.

The board's procedures also require written notification to the UFT chapter leader, principal and custodian prior to the start of the work and the use of a checklist/building material form to determine if any of the building materials contain asbestos or lead.

COAL-FUELED BOILERS

Q: *What about coal-fueled boilers? I heard the board has been replacing them.*

A: The last coal-burning boiler was removed in 2001 – a signal achievement for the UFT campaign that brought the issue to public attention. Since 1988 the board replaced 353 coal-burning boilers and furnaces with cleaner, cheaper and more efficient ones that can burn either natural gas or oil.

The transition from coal to gas also will improve air quality in New York City by eliminating noxious irritants and particulates that can aggravate respiration. It also will contribute to a national effort to reduce acid rain.

Q: *Don't all boilers produce air contaminants?*

A: Yes, but since they are vented into the outside air through a chimney far above street level, there generally is no direct exposure for school building occupants. The switch from the most polluting fuel — coal – to the cleanest — natural gas — will help make the city's air cleaner.

POLLUTION FROM OUTSIDE SOURCES

Q: *In my school, we periodically smell combustion-type fumes in one area of the building. Does this mean there is something wrong with our boiler?*

A: The presence of combustion-type odors may not always indicate a boiler problem. it depends on how widespread they are or how long they are present. If there were a leak in the boiler seal — a rare but hazardous situation — building occupants might detect a strong odor and the odor would be more pronounced in the basement and lower floors and would gradually make its way up to other parts of the building. The custodian would probably be the first to notice the problem and would shut down the boiler until repairs could be made.

In some schools, however — particularly those built in a "U" shape — staff may sporadically smell fumes in rooms facing the interior courtyard. This may occur when a temperature inversion or change in wind direction causes waste gases exiting the school chimney to be pushed back into the courtyard. Although the concentration of waste gases may be sufficient to produce a noticeable odor, most people experience no health effects from such short-term exposure. Even very low levels of sulfur dioxide, however, may affect asthmatics, people with other respiratory problems and those with multiple chemical sensitivity.

Q: *Are there any other situations in which we might smell boiler fumes in our building?*

A: If the air intake vents in a school with a mechanical ventilation system are located too close to the boiler exhaust, combustion waste gases may be drawn into the system and circulated throughout the school. This problem can be corrected by repositioning the vents or by changing the height of the boiler exhaust.

Q: *Periodically we detect the smell of oil inside our school during oil deliveries. Can anything be done about this?*

A: Let the chapter leader know so that this can be brought to the attention of the custodian. The custodian can submit a work order to relocate the vent pipes or change the oil delivery schedule.

Q: *Can pollution from outdoor sources be a problem inside school buildings?*

A: Yes. In schools with mechanical ventilation systems, the intake vents for outside air sometimes are located too close to a source of motor vehicle exhaust, like a bus loading area. In such cases the intake vents need to be repositioned.

If outside (non-school) construction or a local factory or other facility in the area appears to be polluting the air, the union can notify the Department of Environmental Protection to investigate.

RESOLVING INDOOR AIR QUALITY PROBLEMS

Q: *We think there is an air quality problem in our school. What can we do?*

A: The first thing is to ask your UFT chapter leader to consult the principal and custodian to determine if they are aware of the problem and can do anything to resolve it. Even if the custodian can't solve the problem, he or she may be able to help you identify the sources of air contamination in the school.

Your UFT chapter leader or principal can contact the Board of Education's Office of Occupational Safety and Health. The office may ask school staff to fill out logs that record the dates and times when they are disturbed by unusual odors or experience health symptoms that may be associated with air pollution. Such logs can be very helpful in identifying the sources of the problem.

Q: *We have already talked to our principal, the custodian and the Board of Education, but nothing has been done to address the air quality problems in our school. Can the UFT help?*

A: When a school appears to have significant air quality problems that cannot be remedied at the school level, your chapter leader can notify your district representative who will, in turn, contact the UFT Health and Safety Committee. The committee performs an initial investigation and, if warranted, can send the union's industrial hygienists to inspect the school, identify problems and take air quality measurements if necessary.

Often the union's industrial hygienists can recommend relatively low-cost measures to improve the air quality in the school. These might include eliminating water-damaged materials that may contain molds and are causing allergy symptoms; clearing blocked return air vents; or moving photocopy equipment to a location with better ventilation. More expensive repairs might include installation of new local exhaust equipment in a vocational classroom or ductwork to improve air circulation in subdivided classrooms.

United Federation of Teachers
260 Park Avenue South
New York, NY 10010

Stock # 693 I/AB