Indoor Environmental Quality
Why is IAQ a Union Issue?

- Nearly 53 million children and 2 million adults spend their day in schools and 50% of those schools have IAQ problems.
- No federal laws or regulations exist to force IAQ improvement.
- Poor indoor air quality affects learning and causes physical health symptoms.
Schools and colleges are complex environments. Both the building and activities inside and outside the building have the potential for many indoor air concerns.
Children in sick buildings show clear signs of sensory irritation, skin rashes, and mental fatigue.

Poor IAQ reduces the productivity of teachers and staff due to discomfort, sickness, or absenteeism.

Can lead to a prevalence of asthma.
Asthma: Effect on Staff

- Has reached epidemic proportions

- School staff disproportionately affected
  - Research shows teachers are more likely to develop asthma than the general population & many other occupations
  - Female teachers are at increased risk of exposure

Exposure to indoor allergens & irritants may play a significant role in triggering asthma episodes.
Leading chronic illness
- 1 in 13 school-aged children have asthma
- Incidents of acute attacks have doubled in the past 10 years

Leading cause of absenteeism
- blamed for 14 million missed school days
Occupant Issues

- Children
- Elderly
- Allergic persons
- People with respiratory disease
- Asthmatics
- Other diseases
What contributes to a sick building?

- Poor general ventilation
  - lack of fresh air
  - ventilation system not working right
- Deferred maintenance
  - thermostat malfunctions
- Over-crowded facilities
No regulatory standards

Instead of measuring specific pollutants look at

- Potential sources
- Occupancy
- Activities
- Ventilation system
Indoor Sources

- HVAC
- Emissions from office equipment
- Supplies/chemicals
- Shops, labs, cleaning processes
- Bathrooms
- Mechanical systems
- Building materials
- Combustion – boilers, gas heaters
Indoor Sources Cont’d

- Maintenance activities
- Housekeeping activities
- Occupants – smoking, cooking, body odor, perfumes/fragrances
- Construction/Renovations
- Episodes – fire, spills, floods
- Pesticide application
- Dry traps
And there’s....

Water
When mold becomes a problem

Mold is everywhere, *however*

Mold becomes a problem when molds are “amplified”, or exotic species grow inside
Dead mold and spores can still cause allergies

When mold concentrations inside are greater than outside: problem

Symptoms can occur even when mold counts are low
Moisture can come from:
- Condensation – vapor barrier, insulation
- Elevated relative humidity >60 %
- Roof or wall leaks
- Air conditioning drip pans
- Crawl spaces – ground water
- Pipe leaks

You don’t need to know what kind of mold it is ... you just need to get rid of it!
Preventing Mold Problems

- Stop moisture sources
- Keep roofs clean of leaves/debris; make sure drained properly
- Use effective, washable mats and runners by doors to reduce water from shoes
- Use dehumidifiers, moisture barriers, etc.
- Keep debris away from building/air intakes
- Keep paper, cardboard, etc dry
Best Mold Resource: EPA’s “Mold Remediation in Schools and Commercial Buildings”
Measuring specific air pollutants

- Not done unless a good reason to measure
- Volatile Organic Compounds (VOCs)
- CO2, Temp and Humidity
- Fungi and bacteria
- Formaldehyde
- Pesticides
- Dusts or particulate matter
Problems with air samples

- Snap shot in time
- No IAQ standards
- Vary over time
  - Weather – wind direction
  - Ventilation Outdoor Air dampers vary
  - Ventilation systems vary
  - Source varies – carpet, loading dock, garbage dumpster, cleaning schedule, pressure changes
How should an expert look at this problem?

- Interview/survey occupants
- Conduct a walk–around
- Look at all components of the ventilation system–central and unit ventilators
- Take simple measurements – temperature, humidity and carbon dioxide measurements
Construction and Renovation
Construction, demolition, and renovation work is disruptive, dusty, noisy, and potentially dangerous.

School construction: need strong measures to keep students and staff safe and not disrupt learning environments.
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Before</th>
<th>During</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches</td>
<td>0</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Lethargy</td>
<td></td>
<td></td>
<td>3.4</td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaise</td>
<td></td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Weakness</td>
<td></td>
<td></td>
<td>3.4</td>
</tr>
<tr>
<td>Nausea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing</td>
<td>2.0</td>
<td>5.1</td>
<td>4.2</td>
</tr>
<tr>
<td>Eye itch or irritation</td>
<td>2.0</td>
<td>5.1</td>
<td>4.2</td>
</tr>
<tr>
<td>Dry eyes</td>
<td>0</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Blurred vision</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Stuffy or watery nose</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Dry throat</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Arthralgia or joint pain</td>
<td>0</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Skin problems</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Cough and asthma</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Numbness and tingling</td>
<td>0</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Muscle weakness</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Muscle cramps</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Weight loss &amp; Loss of appetite</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Insomnia</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Confusion</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Loss of memory</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Poor concentration</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Edema</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Moodiness</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Fatigue</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Increased perspiration</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Loss of voice or laryngitis</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Hearing loss</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Irregular heartbeat</td>
<td></td>
<td>1-2</td>
<td>1-2</td>
</tr>
</tbody>
</table>

Is This Your Child?
Typical Chemical Sensitivity or “Sick-Building Syndrome” Symptoms

Parents
9 Boys
5 Girls
Construction and Renovation Hazards

- Dust and other particulates
- Asbestos, Lead, PCBs
- Vapors from paints, sealers, glues, varnishes, urethanes and roofing materials
- Vapors from new furnishings and building materials (carpeting, particleboard, plastics)
- Diesel exhaust, carbon monoxide
- Storage of equipment, debris
- Changes in emergency exiting
- Noise
Elements of a Good Construction and Renovation Policy

- Pre-Construction Planning
- Communications
- Complaint Procedures
- Bidding Procedures
- Third Party Commissioning
- Post-Construction Planning
Let's give them a break
Protecting Staff from Communicable Exposures at School

American Federation of Teachers

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Who Are Most Vulnerable?

Staff with:
- Chronic respiratory illnesses
- Chronic heart disease
- Cancer
- Diabetes
- Organ transplants

AND pregnant women (their fetuses or unborn children)
When you sneeze, germs are expelled at about 100 mph, so it’s always a good idea to cover your mouth and to stay away from anyone who’s sneezing.
Exposure Through Infected Blood and Body Fluid

A deep puncture wound from a contaminated needle recently used by an infected individual.

The risk of transmission for blood-borne microbes or pathogens at school is not zero but it is very low.

A very deep bite that draws blood from a student infected with Hepatitis B.

The risk of transmission for blood-borne microbes or pathogens at school is not zero but it is very low.
Exposure Through Skin & Object Contact

Microbes can sometimes spread through touching infectious materials.
People can transmit influenza virus up to 5 days before symptoms occur.

- Airborne droplets are the primary route of transmission.
- The virus can persist for hours in the air.
Fifth Disease

Children are most infectious before the rash appears.

A newly infected mother whose fetus becomes infected may develop anemia and a swelling of the fetus leading to many organ complications.
Whooping Cough

- Caused by a bacteria
- Infected persons are highly contagious before coughing starts
- There is no treatment to help reduce the severity of the coughing
Pediculosis – Lice

Spread by direct contact with infected person or with the objects they use

Larvae attached to hair shaft

Adult Louse
CA-MRSA: Community Associated Methicillin Resistant Staphylococcus Aureus

- bacteria commonly found on the skin or in the nose of healthy people,
- approximately 25 to 30 percent of us are colonized with staph bacteria without becoming ill
- treatment of some staph infections has become more difficult, they have become resistant to various antibiotics
Transmission

- Direct skin to skin contact
- Sharing contaminated personal items (e.g., body towels, razors, soap)
- Poor personal hygiene
- Directed contact with contaminated environmental surfaces
- Living in crowded conditions
Most school staff need at a minimum:

- A booster tetanus and diphtheria every 10 years
- Chicken pox vaccination
- Hepatitis B vaccination
- Influenza or flu vaccination every year
Hand Sanitation

Hand-washing is one of the most effective ways to prevent disease transmission.

Alcohol gel hand sanitizer is effective in killing most germs.
Prevention: Custodial Cleaning

- The custodial staff in your school plays an important role by cleaning and killing germs.

- Changing tables should be cleaned with a solution of water and bleach.
Universal Precautions Experts’ List for Bloodborne Exposures

Assume Everyone Is Infected

- Use barriers between you and a person’s blood/body fluids
- Wear gloves when coming into contact with blood/body fluids
- Wash hands after removing gloves
- When exposure can’t be prevented – wash all exposed skin
- Use disinfectants to clean all spills
- Place used sharps (needles/lancets) in a puncture proof container
Communicable Disease Policies for Schools

- Training for staff
- A reporting & communication system to report communicable diseases
- Immunizations free of charge
- Medical removal of a staff person who may be at risk
- Special counseling to staff at special risk
- Supplies of alcohol gel hand sanitizer & opportunities to wash hands
- A written exposure control plan
OSHA Recommends that Employers Encourage Staff to:

- Stay at home when sick.
- Wash their hands frequently with soap and water or hand sanitizer if no soap or water available.
- Avoid touching noses, mouths, and eyes.
- Cover coughs and sneezes with tissue, or cough and sneeze into their upper sleeves if tissues not available.
- Practice social distancing by maintaining separation of at least 6 feet from other staff, students and the public.
Ergonomics: NYSUT Survey
1. First of all, I would like you to select, from the list I am going to read, the job title that best describes your job:

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>bus drv</td>
<td>73</td>
<td>7.4</td>
</tr>
<tr>
<td>cust, mntnc, gmd wrkr</td>
<td>49</td>
<td>5.0</td>
</tr>
<tr>
<td>food serv</td>
<td>52</td>
<td>5.3</td>
</tr>
<tr>
<td>hlth serv</td>
<td>24</td>
<td>2.4</td>
</tr>
<tr>
<td>sec, circl</td>
<td>91</td>
<td>9.3</td>
</tr>
<tr>
<td>ta, mntr</td>
<td>130</td>
<td>13.3</td>
</tr>
<tr>
<td>ta</td>
<td>144</td>
<td>14.7</td>
</tr>
<tr>
<td>other</td>
<td>328</td>
<td>33.5</td>
</tr>
</tbody>
</table>
2a. With very young children (kindergarten or younger)?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
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<tbody>
<tr>
<td>yes</td>
<td>304</td>
<td>31.0</td>
</tr>
<tr>
<td>no</td>
<td>587</td>
<td>59.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>781</td>
<td>79.7</td>
</tr>
<tr>
<td>no</td>
<td>110</td>
<td>11.2</td>
</tr>
</tbody>
</table>
2c. With medically fragile students?

<table>
<thead>
<tr>
<th>Q2C</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>487</td>
<td>49.7</td>
</tr>
<tr>
<td>no</td>
<td>404</td>
<td>41.2</td>
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</table>

2d. With physically aggressive students?

<table>
<thead>
<tr>
<th>Q2D</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>yes</td>
<td>681</td>
<td>69.5</td>
</tr>
<tr>
<td>no</td>
<td>210</td>
<td>21.4</td>
</tr>
</tbody>
</table>
5. How frequently does this pain or discomfort occur?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>daily</td>
<td>305</td>
</tr>
<tr>
<td>not dly, more than 1 per wk</td>
<td>264</td>
</tr>
<tr>
<td>more than 1 per mo</td>
<td>141</td>
</tr>
<tr>
<td>less than 1 per mo</td>
<td>181</td>
</tr>
</tbody>
</table>
6. What activities do you perform on your job that cause this pain or discomfort?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>rstrng studnts</td>
<td>288</td>
</tr>
<tr>
<td>lft, hndlng, dsabld</td>
<td>164</td>
</tr>
<tr>
<td>lft, hndlng, yng chldrn</td>
<td>135</td>
</tr>
<tr>
<td>lft, hndlng, mtrls</td>
<td>118</td>
</tr>
<tr>
<td>typ, comp wrk</td>
<td>94</td>
</tr>
<tr>
<td>tlphn, desk wrk</td>
<td>27</td>
</tr>
<tr>
<td>flng</td>
<td>18</td>
</tr>
<tr>
<td>oprt mchnry</td>
<td>48</td>
</tr>
<tr>
<td>drv vehicle</td>
<td>52</td>
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</table>
Ergonomics

For School Employees

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What Is Ergonomics

“The Laws of Work Design”

Design the Job to fit the Worker,

Don’t

Force the Worker to fit the Job
Your Workplace Risk Factors

- Lifting & Carrying Heavy Loads
- Using Force
- Bending, Reaching & Twisting
- Repetitive Tasks
- Standing for Long Periods of Time
- Pushing & Pulling
Warning Signs & Symptoms

- **Chronic lower back pain**
- **Self-massaging neck, hands & forearms**
- **Hands that fall asleep frequently**
- **Fear of dropping pots & bottles**
- **Difficulty opening jars or pouring from gallon containers**
- **Shooting pain down arm that wakes you at night**
Seek Out Specialists

Osteopaths & Orthopedists

Rehabilitation Specialists

Sports Medicine Specialists

Occupational Physicians
PREVENTION GOALS for Computer Work

Keyboard & Mouse Trays Can be Retrofitted to Existing Furniture

Wrist Rest Keeps Pressure Off Your Wrists
**Stockroom**
- Mechanical lifts
- Conveyors and carts
- Step ladder with non-skid feet
- Storing heavier items on shelves that are within a comfortable reach

**Cooking & Baking Area**
- Height friendly ovens & steamers
- Carts at rack level for transferring

**Washing Area**
- Automatic pot-washer

**Prep Area**
- Ergonomic knives & scoops
- Height-adjustable work surfaces
- Foot rests
- Mechanical aids for chopping, dicing or mixing foods

**Serving Line**
- Foot rests
- Anti-fatigue matting
- Food carts with large wheels

**Cashier**
Good Practices For Standing

- **In the classroom** – alternating between standing and sitting throughout the day
- **In the kitchen** - Anti-fatigue matting for the kitchen floors
  - To reduce the pain & discomfort of standing
  - To lower the chance of slips & falls
- **Foot rests could also be provided for standing**
- **YOU can help by:**
  - Wearing shoes with lace-up fastenings:
    - Tighten the lace at the instep of footwear
    - Use padding under the tongue & a shock absorbing cushioned insole
  - Not wearing flats or heels higher than 2”
Solutions for Everyday Classroom Ergonomics
Working With Special Needs Children
WHY SO MANY MEDICALLY FRAGILE CHILDREN?

- Drug and alcohol abuse cause physical and mental abnormalities
- HIV Positive/AIDS
- Higher survival rates due to advances in medical technology
- Decreased number “hospital” schools
- No insurance coverage
CONCERNS

- Adequate facilities
- Medical procedures
- Job descriptions
- Training
- Liability
- Supervision
- Cleanliness
- Sanitation
- Legality
- Substitutes
- Privacy
- Confidentiality
- Safety
- Funding
- Crisis management
TASKS NEEDED DURING DAY

- Toileting
- Feeding/snacks
- Hygiene
- Transfers
- 1:1 academics
- Vital signs
- Intake & Output

- Medications
- Diapering
- Suctioning
- Oxygen
- Nap Supervision
- Gait assistance
- Positioning
SAFETY AND HEALTH CONCERNS

- Blood exposure
- Exposure to bacteria/viruses
- Ergonomic injury in tasks (transferring, toileting) assisting without training or appropriate assistive devices.
- Stress due to injury or illness of student as result of improper care
PARAPROFESSIONAL - DUTIES INCLUDE

- Oral hygiene or nail, hair and or skin care
- Preparing nourishment
- Feeding students orally as long as there are no feeding issues
- Care of an incontinent student
- Assistance with bedpan or urinal
- Non-medical aspects of bowel & bladder training.
- Assistance with clothing
Tasks that need training, assessment, and approval by a Registered Professional Nurse

- Clean dressings
- Vital Signs
- Observation of drip gastrostomy feeding
- Stopping drip feeding when ended (no flushing required)
- Intake & Output measurement
- Assisting self-directed students with medications.
- External catheter care
- External care of indwelling catheter
“IF YOU THINK YOU’RE TOO SMALL TO MAKE A DIFFERENCE, YOU’VE NEVER BEEN IN BED WITH A MOSQUITO”