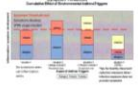




Asthma Management in Schools

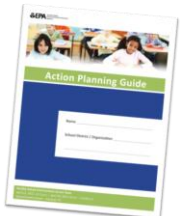
Diane Rhodes, BBA, RRT, AE-C, RCP
 Director, Environmental Health
 North East Independent School District




Indoor Air Quality (IAQ)

Action Planning Guide


As you listen to this presentation, use the chart in your Action Planning Guide to write down any key strategies to install the Six Technical Solutions in your district.




Indoor Air Quality (IAQ)



Summarize NEISD's six key driver framework and its best practice strategies for achieving healthy environments as a means to improve the quality of life for the district's environmentally sensitive population.




Describe the importance of maintaining a healthy environment for all students as it relates to school funding and productivity of student's capacity to learn.



Evaluate the district's four component approach and best practices used for Asthma Management /IAQ and the measured outcomes achieved.

Indoor Air Quality (IAQ)



North East Independent School District
 8961 Tesoro Drive San Antonio, Texas 78217 (210) 407-0000 www.neisd.net

Student Statistics*		Achievement Statistics	
Infant Program	19	Number of Actual Graduates in 2011	3,957
Early Childhood	283	2011 graduates continuing education	98.1%**
Grades PK-5	31,345	2011 Military Academy Appointments	0
Grades 6-8	15,339	2011 Scholarship offers (in millions)	\$72.93
Grades 9-12	20,375	2011 Honor Graduates	1,804
Total Enrollment	67,361	2011 Summa Cum Laude Graduates (100 avg.)	610
Student Demographics:		Reading and Math SAT score (2010-2011)	102****
African American	7.0%	Writing SAT score (2010-2011)	487
Asian	3.5%	2010-2011 National Merit Finalists	20
Hispanic	55.1%	2010-2011 National Merit Semifinalists	23
Native American	0.3%	2010-2011 Commended Scholars	55
Pacific Islander	0.2%	2010-2011 National Hispanic Scholars	54
Two or more	2.7%	2010-2011 National Achievement Scholars	0
White	31.1%		
Free/Reduced Lunch	44.42%		

*Student enrollment information as of November 16, 2011.

Campuses	2011				
	2011	2010	2009	2008	2007
Elementary	44	16	25	28	19
Middle	13	24	30	25	28
High	8	25	8	10	15
Total	65	0	0	0	0

Campus Ratings

	2011	2010	2009	2008	2007
Exemplary	16	25	28	19	9
Recognized	24	30	25	28	28
Acceptable	25	8	10	15	23
Unacceptable	0	0	0	0	0

Employees (FTE)
 Total Teachers: 4,304
 Total Employees: 8,417

Administrative Cost Ratio
 (for districts over 10,000 students)
 NEISD 5.14%
 State Standard 11.05%

Indoor Air Quality (IAQ)

NEISD Four Components of Control: Implemented

Awareness

- School District Impact
- Quality of Life Surveys
- Parent/Staff expectations
- Data, data, data feedback

Medication & Tools

- Emergency Nebulizer Policy
- Asthma Action Plans
- NIHLI EPR 3guidelines
- Health Check ✓ data
- EMS incidents
- Inhaler usage
- Facility Assessment
- Air summary
- Facility scores
- Asthma Control Test

Healthy Environments for ALL students

Environment

- Education and Removing Triggers from home / school environments
- Indoor Environment Quality Best Practices
- Tools for Schools
- Six Technical Solutions
- Tips for Healthy Classroom Air Quality

Education

- Asthma Curriculum
- Environmental Curriculum
- Webinar/Podcasts to staff
- Staff Development /AFC
- Website

Stakeholders: students, parents, staff, community

Indoor Air Quality (IAQ)

Impact on School Districts

- attendance
- performance

Quality of Life

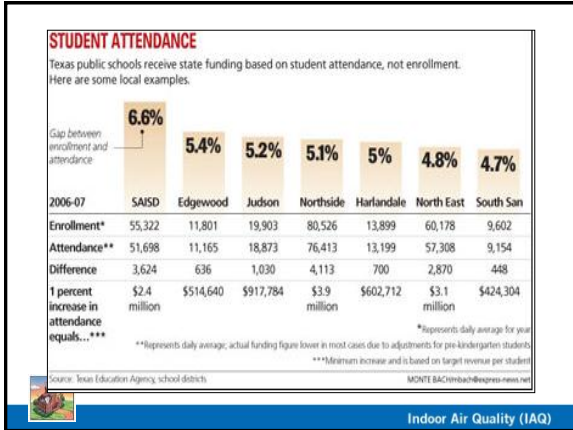
- prevalence
- expectations

Awareness

Communicate

- website
- Environmental relationship to health / performance

Indoor Air Quality (IAQ)



The State of Texas Assessments of Academic Readiness (STAAR)

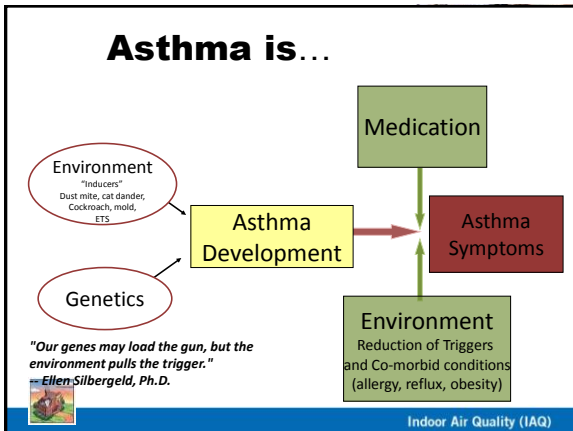
kills "Death by one cell" – Dr. Richard Middleton

- STAAR will measure college readiness
- STAAR covers grades 3 - 11
- STAAR tests will be more rigorous than the TAKS test
- STAAR will include the following elementary school assessments:
 - 3rd grade Mathematics and Reading
 - 4th grade Mathematics, Reading and Writing
 - 5th grade Mathematics, Reading and Science
- STAAR will include the following middle school assessments:
 - 6th grade Mathematics and Reading
 - 7th grade Mathematics, Reading and Writing
 - 8th grade Mathematics, Reading, Social Studies and Science
- STAAR includes 12 end-of-course assessments at high school:
 - Math: Algebra I, Geometry, Algebra II (was one test 10th grade)
 - Science: Biology, Chemistry, Physics (was one test 10th grade)
 - English Language Arts: English I, English II, English III (was Reading 9, LA 10)
 - Social Studies: World Geography, World History, U.S. History (was one test 10th grade)

English Language Learners
Completion Rates (DropOut)

No Child Left Behind

Health disparities result from multiple factors, including **Poverty**, **Environmental threats**, **Inadequate access to health care**, **Individual and behavioral factors**, and **Educational inequalities**.



- ### Worth repeating.....
- #### Asthmatics should have:
- Normal activity level
 - Ability to engage in desired activities
 - No school days missed
 - Reliever inhaler use **less than twice per week**
 - Night-time cough **less than twice per month**
 - Normal (or "near normal") pulmonary function
 - No Emergency Room / Urgent Care visits
 - No Hospitalizations

Web-based Asthma Survey located on NEISD Parent Portal

Control of Asthma defined as

- No absences from school
- No interruptions of class time due to symptoms
- No use of inhaler more than 2 times per week
- No coughing during the night
- Participation in all physical activities
- No emergency or urgent care visits

National Asthma Education Prevention Program

1. In the past 12 months, how many school days has your child missed because of ASTHMA?

	(A) 0	(B) 1-3	(C) 4-6	(D) 7-9	(E) 10 or more
Diagnosed	47.1%	33.7%	11.4%	3.6%	4.2%
Roosevelt	39.0%	30.9%	16.3%	4.9%	6.5%
Lee	27.1%	50.0%	14.6%	6.3%	2.1%
Undiagnosed		22.1%	3.7%	.5%	.5%

2. 70,000 visits to school nurse for use of reliever medication

Control of Asthma defined as

- No absences from school
- No interruptions of class time due to symptoms
- No use of inhaler more than 2 times per week
- No coughing during the night
- Participation in all physical activities
- No emergency or urgent care visits

National Asthma Education Prevention Program

3. In the past 30 days, how often did your child use asthma medication (Albuterol) that was prescribed or given to you by your doctor for treatment of his/her asthma symptoms?

	>2 times/day	1/day	2/week	1-2 /month	Never
Diagnosed	45.1%	5.3%	9.7%	24.2%	15.6%
Lee	56.3%	25.0%	10.4%	8.3%	0%

4. In the past 12 months, how many times has your child's sleep been interrupted by wheezing or coughing?

	(A) 0	(B) 1-3	(C) 4-6	(D) 7-9	(E) 10
Diagnosed	24.8%	40.9%	15.6%	7.0%	11.7%

Control of Asthma defined as

- No absences from school
- No interruptions of class time due to symptoms
- No use of inhaler more than 2 times per week
- No coughing during the night
- Participation in all physical activities**
- No emergency or urgent care visits**

National Asthma Education Prevention Program

5. Has your child had coughing, wheezing, or shortness of breath with exercise or activity and had to stop because of these symptoms in the past 12 months?

Diagnosed **yes 76.6%** no 21.2%

6. In the past 12 months, how many times did your child visit an emergency room or urgent care center because of his/her asthma?

	0	1-3 times	4-6 times	6-9 times	10+
NEISD	75%	20%	4%	1%	0%
Roosevelt	54%	37%	5%	2%	1%

Whom does your child see for his/her asthma? Diagnosed

	family doctor	pediatrician	allergist	pulmonologist
NEISD	17.8%	47.6%	22.6%	11.4%
Top Prospect	20.8%	60.4%	8.3%	4.2%
	35.8%	51.2%	2.4%	5.7%

Indoor Air Quality (IAQ)

Communicate – Goals and Expectations

Parent Welcome Packet:

- Establish asthma control expectations
- Environmental connection
- Website

Clinic visit encounter : Asthma Control Test

- Used when frequent PRN usage for symptoms
- Communicate with physician
- www.asthmacontrol.com

Indoor Air Quality (IAQ)

Medication/ Tools

- NHLBI EPR 3 Guidelines
 - In-services - RN's
 - Proactive Disease management
 - Tools/resources
- Asthma Action Plans
 - Asthma Coalitions STAC
- Data Collection
 - PRN inhaler usage
 - Healthcheck v data
 - Air Summary
 - Facilities Evaluation
- Nebulizer Protocol
 - need
 - evaluation
- Continuity of Care
 - Physician
 - Parents

Indoor Air Quality (IAQ)

Asthma Management

Assessing Level of Control

	Well Controlled	Not Well Controlled	Very Poorly Controlled
Symptoms	≤ 2 days/week	≥ 2 days/week	throughout the day
Interference of activity	none	≥ 2 days/week	extremely limited
Use of SABA	≤ 2 days/week	≥ 2x/month	several times per day
Nighttime awakenings	≤ 1x/month	≥ 2x/month	≥ 2 x / week
ACT	≥ 19	15-19	≤ 15
Recommended Action for Treatment	<ul style="list-style-type: none"> Regular follow-up every 1-6 months Maintain current step Consider step down if well controlled for at least 3 months 	<ul style="list-style-type: none"> Step up at least 1 step and reevaluate in 2-6 weeks For side effects: consider alternative treatment options 	<ul style="list-style-type: none"> Consider short course of systemic oral corticosteroids Step up 1-2 steps and reevaluate in 2 weeks For side effects: consider alternative treatment options

Indoor Air Quality (IAQ)

Children 0-4 Years of Age

Children 5-11 Years of Age

Step up if needed (first check controller/reliever, environmental control, and assess control)

Step down if possible (first asthma is well controlled at least 3 months)

Step	Preferred	Alternative
Step 1	SABA only	SABA only
Step 2	Low-dose ICS	Low-dose ICS
Step 3	Medium-dose ICS	Low-dose ICS + LABA or Montelukast
Step 4	High-dose ICS	Low-dose ICS + LABA or Montelukast
Step 5	High-dose ICS + LABA	High-dose ICS + LABA
Step 6	High-dose ICS + LABA + Long-acting β ₂ -agonist	High-dose ICS + LABA + Long-acting β ₂ -agonist

Each Step: Patient Education and Environmental Control

Quick-Relief Medication

Indoor Air Quality (IAQ)

Parent understanding of Asthma Action Plan

2 types of medications

Maintenance meds

Reliever meds

Asthma Inhalers

Inhaled Bronchodilators

Inhaled Anti-Inflammatories

Combination Medications

Nasal Steroid Sprays:

- Becnas AQ, Vancense DS AQ® (beclomethasone)
- Flixonac® Veramyst® (fluticasone)
- Nasacort AQ®, Nasacort® (triamcinolone)
- Nasarel® (flunisolide)
- Nasonex® (mometasone)
- Rhinocort® (budesonide)

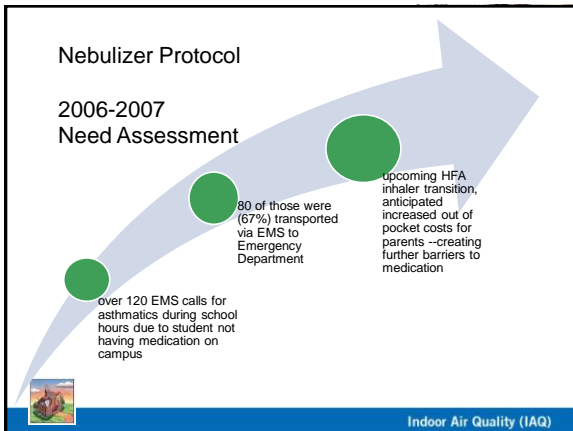
Indoor Air Quality (IAQ)

NEISD Health Check v data collection program – assess/evaluate

Assessment	Respiratory Infections	Head Lice	Stomach Issues	Eye Issues	Ear Issues	Hand Hygiene	Hand Washing	Hand Sanitizer	Hand Disinfectant	Hand Soap	Hand Towels	Hand Dryers	Hand Sanitizer	Hand Soap	Hand Towels	Hand Dryers
CAMELOT E.S. student population 576 – 15% asthma prevalence rate																
November Entire Month	268	62	0	0	0	41	22	1	14	0	4	9	5	0		
Week 1 - (05 Nov 2010 - 06 Nov 2010)	77	15	0	0	0	14	8	1	4	0	2	5	3	0		
Week 2 - (07 Nov 2010 - 13 Nov 2010)	81	15	0	0	0	11	3	0	4	0	2	2	1	0		
Week 3 - (14 Nov 2010 - 20 Nov 2010)	89	24	0	0	0	9	7	0	5	0	0	1	1	0		
Week 4 - (21 Nov 2010 - 26 Nov 2010)	21	8	0	0	0	7	4	0	1	0	0	1	0	0		
TUSCANY HEIGHTS E.S. student population 675 – 10% asthma prevalence rate																
November Entire Month	70	23	0	2	0	76	18	1	9	0	1	0	0	0		
Week 1 - (01 Nov 2010 - 06 Nov 2010)	15	6	0	0	0	13	10	0	2	0	0	0	0	0		
Week 2 - (07 Nov 2010 - 13 Nov 2010)	22	7	0	0	0	27	3	0	2	0	1	0	0	0		
Week 3 - (14 Nov 2010 - 20 Nov 2010)	29	9	0	2	0	25	5	1	4	0	0	0	0	0		
Week 4 - (21 Nov 2010 - 26 Nov 2010)	12	1	0	0	0	11	0	0	1	0	0	0	0	0		

Improved NEISD Health Check v data collection program – assess/evaluate

Assessment	Respiratory Infections	Head Lice	Stomach Issues	Eye Issues	Ear Issues	Hand Hygiene	Hand Washing	Hand Sanitizer	Hand Soap	Hand Towels	Hand Dryers	Hand Sanitizer	Hand Soap	Hand Towels	Hand Dryers	
January Entire Month																
Room No.	10	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
Location	11	0	1	0	0	0	2	0	0	0	0	0	1	0	0	0
	16	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
	18	14	0	0	0	0	5	1	0	2	0	0	0	0	0	0
	19	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
	20	7	0	0	0	0	0	0	0	2	0	0	1	0	0	0
	21	14	12	0	0	0	5	2	0	1	0	0	0	0	1	0
	22	9	7	0	0	0	1	1	0	0	0	0	0	0	0	0
	24	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	37	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	9	33	0	0	0	3	5	0	7	0	1	0	0	0	0
	40	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0
	41	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
	5	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0
	6	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
	9	7	0	0	0	0	28	2	0	0	0	0	0	0	0	0



Nebulizer Protocol

THIS ASSESSMENT APPLIES ONLY TO STUDENTS WHO HAVE A CURRENT DIAGNOSIS OF ASTHMA, AND/OR ARE UNDER THE CARE OF A PHYSICIAN FOR THEIR ASTHMA, AND/OR HAVE CURRENT ORDERS FOR ASTHMA TREATMENT.

North East Independent School District
 10000 DALLAS ROAD, SUITE 100
 DALLAS, TEXAS 75243-1000
 TEL: 972.343.1000 FAX: 972.343.1001

NEBULIZER PROTOCOL SUMMARY

1. Use nebulizer only when prescribed by a physician.

2. Use nebulizer only when prescribed by a physician.

3. Use nebulizer only when prescribed by a physician.

4. Use nebulizer only when prescribed by a physician.

5. Use nebulizer only when prescribed by a physician.

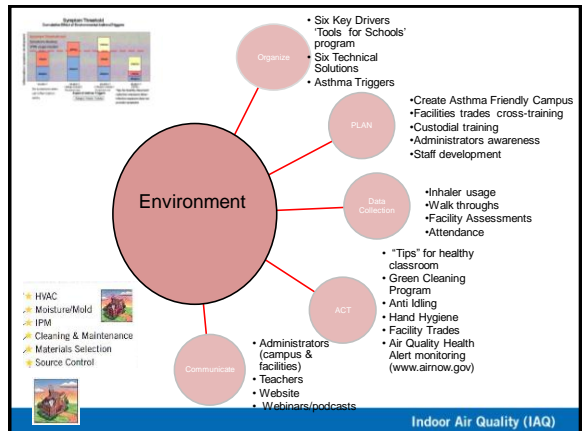
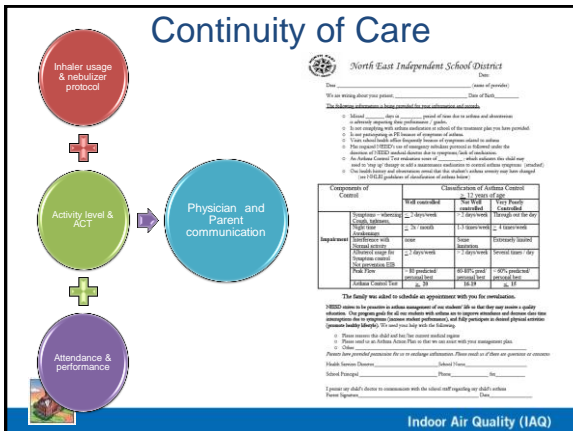
6. Use nebulizer only when prescribed by a physician.

7. Use nebulizer only when prescribed by a physician.

8. Use nebulizer only when prescribed by a physician.

9. Use nebulizer only when prescribed by a physician.

10. Use nebulizer only when prescribed by a physician.



Transitional Research

- Evidence of the impact of the environment on asthma incidence and morbidity ---**especially allergens and irritants has been mounting**⁹
- Evidence strengthens recommendations that **reducing exposure to inhalant indoor allergens can improve asthma control** and that a *multifaceted* approach is required; **single steps to reduce exposure are generally ineffective**¹⁰
- Exposure of patients who have asthma to irritants or allergens is which they are sensitive has been shown to **increase symptoms and precipitate exacerbations**.¹⁰

⁹ The state of Childhood Asthma, US 1980-2005
¹⁰ NHLBI New Guidelines , NAEPP, 2007 update



Indoor Air Quality (IAQ)

Tiny particles float in our indoor environment. Our nose normally traps the particles you see here. It's the particles you don't see that are the problem. If you were to look what is in these particles microscopically you would find...

ALLERGENS - dust, dust mites, mold spores, rodent dander/droppings, pet dander, cockroach by-products, and even the pollens from outside can enter into the home environment.

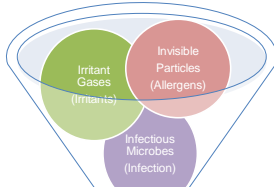
IRRITANTS - volatile organic compounds (VOC) and other ultra fine particles.

INFECTIOUS MICROBES (germs, viruses, bacteria).



Indoor Air Quality (IAQ)

What factors affect the classroom indoor environment and learning conditions



Causes for poor indoor environmental quality

Infections + Invisible particles + Irritants =
Inflammation process



Indoor Air Quality (IAQ)

Environmental Awareness

- **Aerosols Levels in the classroom**
- Airborne particles have the potential to cause allergic reactions, skin irritation, coughing, sneezing, respiratory difficulties and circulatory system problems.
- **Ventilation Practices for the classroom**
- Total volatile organic compounds (TVOC), formaldehyde, and biological contaminants are causes for occupant discomfort and poor health outcomes.
- **Cold/Flu Virus Transmission Paths in the classroom**
- Bacterial and Viral respiratory tract infections are associated with the majority of asthma exacerbations and illnesses in both children and adults



Indoor Air Quality (IAQ)

Indoor Air Quality at Schools Concerns That Affect Attendance and Learning

Aerosols Levels in the classroom

ALLERGENS-- Airborne dust particles can carry allergens and have the potential to cause allergic reaction, skin irritation, coughing , sneezing and respiratory difficulties

- Pollen
Grass Cutting, seasonal pollination
- Molds
Wet carpet, plants, obstructed A/C vents, high relative humidity
- Animals
In, and out, of the classroom
- Cockroaches
Snacks attract pests
- Dust (dust mites)
Carpet, stuffed animals, pillows, curtains, air vents, chalk, cushions, 'fluffy' stuff



Indoor Air Quality (IAQ)


The dust mite



Indoor Air Quality (IAQ)


Dust Mite

The dust mite is one of the most significant sources implicated in allergic asthma, rhinitis, conjunctivitis and dermatitis. If you are allergic to dust, you are allergic to the feces/carcasses of the dust mite. **As many as 10% of the general population and 45-90% of allergic asthmatics are sensitive to dust mites.** Many experts suggest that more than 50% of asthma attacks are triggered by the allergenic proteins contained in the fecal matter of dust mites.



The dust mite thrives in the modern environment of fully-carpeted, double-glazed, draft-proof homes/schools, and is comfortable at 77 degrees Fahrenheit) and 70% relative humidity.



The dust mite does not bite or sting. The mite generally lives on shed **human/animal skin cells**. An average person sheds about 1.5 grams of skin a day (approximately 0.3-0.45 kg per year), which is enough to feed roughly a **million** dust mites. People become allergic to proteins in mite body parts and mite feces. These fecal pellets are as tiny as some pollen grains and can float easily into the air and get carried into the nose and lungs.



Indoor Air Quality (IAQ)


Dust Mite (cont)

- **Approximately 19000 dust mites have been counted in one gram of house dust (approximate weight of a paperclip)**
 - * **One square yard of carpet can contain as many as 100,000 dust mites**
 - * **A bed may be housing as many as 10 million. over 10 years your mattress will gain 20 pounds**
 - * **A pillow of only two years old can be composed of up to ten percent dust mite feces and carcasses.**
- Dust mites **reproduce quickly** enough that their effect on human health can be significant. The average life cycle for a mated female dust mite can live for 10 weeks, laying 60 to 100 eggs in the last 5 weeks of her life. In a 10 week life span, a dust mite will produce approximately 2000 fecal particles and an even larger number of partially digested enzyme-infested dust particles.


Indo

Measures to control dust mites:



- Reduce ambient humidity below 60% to inhibit growth
- **Cut clutter.** If it collects dust, it also collects dust mites. Remove knickknacks, tabletop ornaments, books, magazines and newspapers
- **Remove carpeting and other dust mite habitats.** Carpeting provides a comfortable habitat for dust mites. This is especially true if carpeting is over concrete, which holds moisture easily and provides a humid environment for mites. If possible, replace carpeting with tile, wood, linoleum or vinyl flooring.
- Consider replacing other dust-collecting furnishings, such upholstered furniture, nonwashable curtains and horizontal blinds.
- Vacuuming carpeted areas regularly, preferably with a **HEPA** filter-equipped vacuum cleaner
- Regular damp dusting of surfaces

Wash sheets, pillows, curtains, stuffed toys and clothing at least every week over 140° F hot water



Indoor Air Quality (IAQ)


Indoor Air Quality at Schools

Concerns That Affect Attendance and Learning

2. IRRITANTS

-- Total volatile organic compounds (TVOC): formaldehyde, body odors, and biological contaminants are causes for occupant discomfort and increase inflammation

- Tobacco Smoke
- Perfumes
 - Lotions, hair spray, aerosols
- Ozone/Air Quality Alert Days
- Exhaust
 - Buses, cars
- Chemicals
 - Markers, paints, science supplies
- Strong Odors
 - Air fresheners, off gassing



Indoor Air Quality (IAQ)

OUTSIDE Triggers

Air Quality Index

AQI (Combined O₃ and PM_{2.5})
MAXIMUM: JANUARY 09, 2012 12:00 AM EST



www.airnow.gov

Department monitors AQI index – email notification process when levels are actually reached





Indoor Air Quality (IAQ)

Indoor Products: Formaldehyde and VOCs


- can arise from sources such as new linoleum flooring, synthetic carpeting, particleboard, wall coverings, furniture, and recent painting—have been implicated as potential risk factors for the onset of asthma and wheezing

- Chemicals
- Cleaning Supplies
- Scented Materials
- Occupant Practices

National Education Association Health Information Network online survey on adverse health effects of scented products.
Results:

- Perfumes – 75%
- Lotions – 61%
- Body sprays/ lotions -58%
- Air fresheners --71%
- Candles -- 64%

MAKE ASTHMA SYMPTOMS WORSE



Indoor Air Quality (IAQ)

Children, Learning and Toxins Don't MIX

ALL Children are especially vulnerable to environmental health hazards

- Body organs are still developing
- (Inhalation) breathe more air per pound of body weight than adults
Aerosols, vapors, fumes, or dusts can be inhaled triggering nasal congestion, shortness of breath, cough, wheezing, watery eyes, headache, dizziness, fatigue, nausea,
- (Skin contact) residuals can damage skin or be absorbed by skin, rashes, dermatitis
- (Ingestion) unable to detoxify, hands to mouth, poor handwashing practices, behavior exposes them to more risk and unable to realize risk

Of the thousands of synthetic chemicals in commercial use today, only a small fraction have been tested for toxicity

Synthetic Organic Chemical Production
United States, 1945 - 1985

Indoor Air Quality (IAQ)

Control Pollutants –

Anything that produces an aerosol or emits an odor has the potential to be an irritant
Be mindful of the new product 'smells' they produces VOCs that can lead to meeting the symptom threshold . Allow 'off gassing' time periods

Pressed wood materials

'new' car smell

Maintain moderate temperature and humidity levels and provide adequate ventilation; use low emitting products.

Indoor Air Quality (IAQ)

Indoor Air Quality at Schools Concerns That Affect Attendance

3. INFECTIONS Cold/Flu virus transmission

-- Viral respiratory tract infections, particularly of rhinoviruses, are associated with the majority of asthma exacerbations in both children and adults.

- Colds
- Flu
- Poor Hygiene Practices

Indoor Air Quality (IAQ)

Microbial Contamination of Surfaces

Viruses were found in the greatest numbers on the following surfaces, in order from the highest to the lowest

- Desk tops,
- Faucet handles,
- Classroom doorknobs.
- Computer keyboards/mouse

A. Boon and C. P. Gerba, Significance of Fomites in the Spread of Respiratory and Enteric Viral Infections, APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Mar. 2007, p. 1168-1169. (IAQ)

Hand Hygiene

Good hand and surface hygiene can reduce illness and school absenteeism rate among children and adults by 30% to 50%

Source: Charles P. Gerba, Ph.D University of Arizona
Cleaning Up: Battling Germs in School Facilities. School Business Affairs volume 75, number 2, Association of School Business Officials International February, 2009.

Hand Sanitizers

Alcohol Based Sanitizers

- Potential Fire Hazard
- Possible Poison Agent
- Skin Irritant
- Nervous System Disruptor

Non Alcohol Based Sanitizers

Foaming Cleaners

- Smaller Quantity
- Residual Kill
- Fragrance free

Hand Wipe Towels

- Remove Dirt
- Residual Kill
- Fragrance free.

Indoor Air Quality (IAQ)

The Framework for Effective School IAQ Management: Six Technical Solutions

Quality HVAC

- Inspect HVAC systems regularly
- Establish a maintenance plan
- Change filters regularly and ensure moderate pores are cleaning
- Provide outdoor air ventilation according to ASHRAE Standard or local code
- Clean air supply diffusers, return registers, and outside air intakes
- Keep unit ventilators clear of books, papers, and other items

Control of Moisture/Mold

- Conduct routine moisture inspections
- Establish mold prevention and remediation plan
- Maintain indoor humidity levels between 30% and 60%
- Address moisture problems promptly
- Dry wet areas within 24-48 hours

Strong Integrated Pest Management (SIPM)

- Inspect and monitor for pests
- Establish an IPM plan
- Use spot treatments and baits
- Communicate with occupants prior to pesticide use
- Mark indoor and outdoor areas treated with pesticides

Effective Cleaning & Maintenance

- Conduct routine inspections of school environment
- Develop a preventative maintenance plan
- Train cleaning/maintenance staff on protocols
- Ensure material safety data sheets (MSDS) are available to staff
- Clean and remove dust with damp cloth
- Vacuum using high-efficiency filters

Smart Materials Selection

- Maintain products inventory
- Develop low-emitting products purchasing and use policies
- Use only formaldehyde-free materials
- Use only low-toxicity and low-emitting paint
- Select products based on product rating systems
- Use least toxic cleaners possible (only those approved by the district)


Aggressive Source Control

- Conduct regular building walkthrough inspections
- Test for radon; mitigate if necessary
- Implement a hazardous materials plan (use, label, storage and disposal)
- Establish a school chemical management and inventory plan
- Implement Smoke-Free policies
- Establish an anti-idling school bus policy
- Use walk-off mats at building entrances
- Conduct pollutant-releasing activities when school is unoccupied

Indoor Air Quality (IAQ)

Technical Solutions can be impacted by occupant behavior

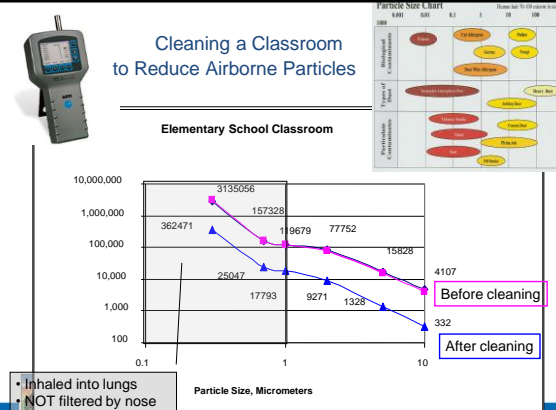
- Impedes Custodial cleaning practices
- Increases dust collection
- Increases microscopic particle counts
- Reservoirs for pests
- Impedes effective ventilation



Examples of Cluttered Classrooms

Cleaning a Classroom to Reduce Airborne Particles

Elementary School Classroom



Particle Size (micrometers)	Before cleaning	After cleaning
10,000,000	3135056	157328
1,000,000	362471	17793
100,000	25047	9271
10,000	9679	1328
1,000	77752	4107
100	15828	332

Inhaled into lungs
NOT filtered by nose

Best Practices: Reduced Classroom Clutter and Furnishings

- Walk through Assessments
- Healthy Tips for Classrooms
- Asthma Friendly Campus Award program




Examples of Organized Classrooms

Tips for Providing a Healthier Learning Environment

Department of Environmental Health

Maintain Quality HVAC to allow circulation of air in your classroom	Control and Report Moisture in your classroom	Assist in strong Integrated Pest Management in your classroom	Cleaning & Maintenance Source Control	Allow Effective Cleaning practices in your classroom	Utilize Smart Material Selection for your classroom	Support Aggressive Source Control from entering the building
<p>Healthier Children</p> <p>AC units should not be used as heaters or to heat rooms designed for office or classrooms.</p> <p>Have fans to help circulate air in classrooms when occupied.</p> <p>Do not block air supply or exhaust vents.</p> <p>Communicate with faculty staff regarding maintenance requests for your classroom.</p> <p>Keep your rooms well-ventilated for the general public not just students.</p> <p>Be aware of odors, pest infestations in rooms, and pay attention to increases in mold, mildew, or allergens (dust, pollen, etc.) each year or increases in noise levels.</p>	<p>Healthier Children</p> <p>Maintain and report if condensation occurs on inside of windows.</p> <p>Don't allow moldy ceiling tiles to remain.</p> <p>Report water leaks, dripping pipes, or water stains to administrator.</p> <p>Report finding of damp materials, areas of high humidity, and musty or moldy smells in classrooms.</p> <p>Do not attempt to mask musty smells with deodorizers.</p> <p>Don't allow liquid spills on carpeting to remain undisturbed completely.</p> <p>Be aware of and report any signs of water (leaking or stains) in classrooms or restrooms.</p>	<p>Healthier Children</p> <p>No live plants or soil pot attractants (ants) if capped small animals (rodents) which require 20 health certificate. To avoid pest infestations, daily cage cleaning and removal of animal waste by product will be performed by teacher.</p> <p>Don't allow food or beverages unless necessary. Use a plastic bin with lid that can be sealed to reduce the attraction of pests.</p> <p>Minimize use of card board boxes, including ground for storage.</p> <p>Remove unused items from under desks and closets where pests hide.</p>	<p>Healthier Children</p> <p>By working together we can create an optimal healthy environment for ALL children.</p> <p>Reduce student absenteeism and increase average daily attendance.</p> <p>It's important to increase student performance.</p> <p>Reduce staff health issues and decrease health care costs.</p> <p>Improve staff productivity.</p>	<p>Healthier Children</p> <p>Maintain a clutter free classroom where the custodian can effectively clean your room in 15 minutes or less.</p> <p>Avoid clutter by storing loose items in plastic bins with lids that can be sealed clean.</p> <p>Avoid dust catching items (curtains, pillows, throw rugs, hanging items, stuffed animals, etc.)</p> <p>The accumulation of papers, books, and other projects, etc. attract and harbor effective cleaning.</p> <p>Conduct rooming (vacuuming) from your classroom at the end of the day.</p> <p>Use of disinfecting chemicals only.</p>	<p>Healthier Children</p> <p>Eliminate room deodorizers, air fresheners, plug-ins, candles, potpourri and any other scented products.</p> <p>Avoid aerosol products, wet towels or sponges down spillover when possible.</p> <p>Flirts in clear water permit, do not use.</p> <p>Avoid use of strong odor products, oil base odor dry erase markers.</p> <p>Animals brought in should be for purposes only and in compliance with plan. Avoid bringing in any animals if there are children in class who are sensitive to animals, rodents or other.</p> <p>Seal all art, science supplies tightly. Use in well-ventilated areas.</p>	<p>Healthier Children</p> <p>Do not allow students to bring stuffed animals, ligatures, pillows from home, these are four allergen sources.</p> <p>District student/staff policy limiting amount of personal belongings of chemical can be considered because of chemical brought home from home.</p> <p>Do not bring any chemical, fragrance, perfume, etc. to school.</p> <p>It is important to increase student performance.</p> <p>No barriers or partitions. These create noise which is a long distance.</p> <p>No upholstered furniture brought from home.</p>

Planning leads to Action



Carpet Removal
De-cluttering
Green Cleaning
Custodial Training
Cleaning Efficiency
HVAC Filter program - MERV 8 to MERV 13
Integrated Pest Management
EMC Commissioning
HEPA Filter Vacuums
Water intrusion trailer
Drying Equipment
Earth Retainer Blocks
Chemical 'overuse' Policy
Occupant Best Practices "Tips"
Environmental Walk Thru / Work Order

Indoor Air Quality (IAQ)

Environmental Assessment

Objective:
To ensure a healthy environment for NEISD students, staff, and visitors by providing a healthy environment. By using best known practices in environmental health we will effectively best utilize district funds, staffing, and training processes to achieve healthy environments for all.

Purpose:
To improve the capacity of student / staff attendance and student/staff performance while reducing absenteeism of students/staff and reduce district health care costs

Indoor Air Quality (IAQ)

Scope: The Environmental Assessment of Facilities will be performed

- ▶ HVAC
- ▶ Moisture/Mold
- ▶ IPM
- ▶ Cleaning & Maintenance
- ▶ Materials Selection
- ▶ Source Control


Visual inspection of Technical Solutions (Classroom, Custodial, Chemical, Facility categories)

Classroom – occupant behavior and education
 Custodial – cleaning standards being met and / or evaluating training processes
 Facility – identifying maintenance issues (easy remedy on-site or generate work order)
 Chemical – identifying chemicals and safety in Science labs
Air summary – pre-identified and random locations. Measurement of ventilation and comfort parameters (HVAC/Moisture)

Symptom driven IAQ work order is generated due to symptoms or concerns of student/staff

Symptom- driven work order air investigations will include an assessment of **Technical Solutions**
 Observation of conditions in the identified area of concern (Classroom, Custodial, Facility, as above)
 Interviews with staff individuals experiencing symptoms (per work order or interview) or campus nurse

Data will be evaluated with correlations to attendance issues, campus clinic health reports, and facility map and distributed to campus administrators when necessary.



Indoor Air Quality (IAQ)

Environmental Assessment

Assessment score of each classroom based on predetermined standards by areas

- 100 – (acceptable) no action required
- 50 – (ok) room for improvement
- 0 – (concern) education/action needed (work order generated)

Occupant
 clutter, stuffed animals, plants, furry animals, blocking of ERUs etc


Custodial
 high touch cleanliness, dust practices, infection control measures, etc

Facilities
 plumbing leaks, HVACs, exhaust fans, grounds, pests, etc

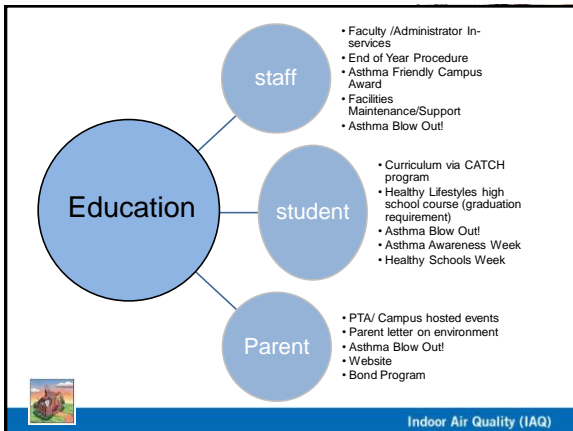
Chemical Storage (NIOSH high school lab standards)

Air Summaries
 Particle counts, CO2 levels, humidity, air flow

Five possible areas – average score for each classroom and overall campus score



Indoor Air Quality (IAQ)



Asthma Triggers

IAQ

Custodial /Facilities Trade Training on Environmental Health

Managing Indoor Environmental Quality (IEQ) Leads to Green and Healthy Schools

Attend a FREE, one-day training on May 12, 2011, in San Antonio, Texas, to find the solutions!

Department of Environmental Health
 Environmental Assessment of Facilities
 Healthy Classrooms Air Leads to Better Learning

Podcast available to:

- all district area custodial foreman
- all head custodians
- all campus custodians



Indoor Air Quality (IAQ)

Education to Administrators

Same grade level
 Same classroom size


Custodial staff unable to clean effectively

Recently environmental assessments were performed at your campus. Please find below the results:

Campus: WEST AVE E.S.
 Avg Campus Score: 93.7%

Avg Teaching Environment score: 96.2%
 Avg Custodial score: 89.6%
 Avg Facility score: 100%
 Avg Chemical Storage score: -N/A-
 Avg Air Summary score: 88%

Custodial staff can clean room within 15 minute district time frame



Indoor Air Quality (IAQ)

Coordinated Approach

Improving the quality of life of the child with asthma involves a **multifaceted approach** — the child, parents, physician, and schools working together

- Children of age should take action to help manage their asthma
- Parents must understand definition of asthma control, recognize the symptoms of asthma, seek proper medical diagnosis and treatment and manage triggers in the home
- Physicians must be kept informed of student's level of asthma control to prescribe proper medication regimen
- Schools should facilitate the provision of asthma education and treatment modalities when appropriate and strive to remove asthma triggers from the environment

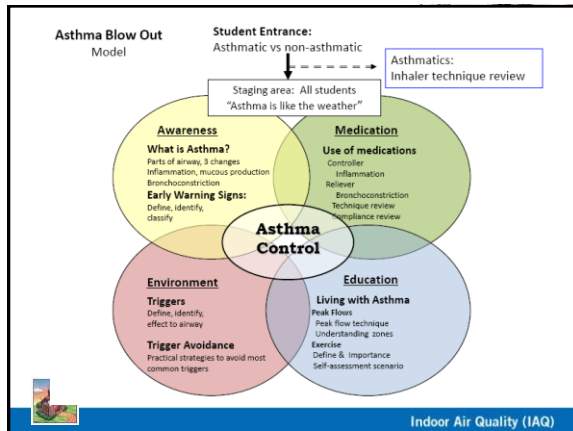
This collaborative approach can facilitate asthma control for the child with asthma

Indoor Air Quality (IAQ)

Asthma Blow Out

- By Cluster – elementary and middle schools that feed into High school
- Principal participation – offer campus incentives for attendance
- Adult teaching done by Asthma Specialist physicians
- Student teaching done by campus nurse and campus physical education teachers
 - secondary
 - elementary
- Asthma educators - inhaler technique and medication review
- Advertise via district public relations
 - 1000 – 2000 people in attendance

Indoor Air Quality (IAQ)



Indoor Air Quality (IAQ)

Asthma Blow Out !

Student Sessions



What is Asthma ?



Early Warning Signs



Triggers



Medication



Trigger Avoidance



Living with Asthma & Exercise

Indoor Air Quality (IAQ)

Make it fun, make it relevant

Controlled Asthma

Uncontrolled Asthma

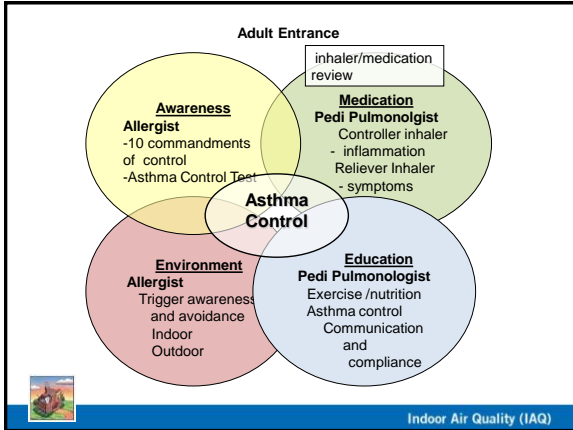


Indoor Air Quality (IAQ)

Feedback from students

- "I know that I have to use my controller medicines, or my asthma can turn into an emergency. Plus, if I use my preventative medications, it prevents me from missing class and having to go to see the nurse."
- "I don't have asthma, but my brother does. I learned that when he plays football, pollen can rise from the ground and be a problem for him."
- "I learned how to take better care of everyone in my family. I have lots of stuffed animals, and these can become dust bags. The dust isn't good for my brother, and it isn't good for anyone else"
- "I'm also going to get rid of aerosol sprays because they can be really dangerous for my brother. I learned that if he gets the aerosol in his lungs, he will need to use his inhaler."
- "I want to get rid of as many triggers as I can so that my brother can breathe easier."

Indoor Air Quality (IAQ)



Asthma Blow Out !

Parent Sessions

Awareness - Allergist

Medication - PEDI Pulmonologist

Respiratory Therapist - Free 'spacer' Inhaler technique

Education - PEDI Pulmonologist

Environment-Allergist

Indoor Air Quality (IAQ)

Reducing Communication Barriers – Spanish translation

English to Spanish translation through headsets

Indoor Air Quality (IAQ)

Parent evaluation of Asthma Blow Out

I can't tell you how much my daughter (middle school student) and I learned at the Asthma Blow-Out last night at Johnson High School. Thank you so much for everything NEISD did to coordinate the event.

Although she has had problems with asthma for years, we have always been reactive in dealing with it. She basically takes allergy medication and uses an inhaler when she needs it. We both learned so much last night that we never knew about prevention and management. Even with regular checkups we've apparently missed a lot of information. Now I understand there are options for keeping asthma under control and avoiding problems altogether.

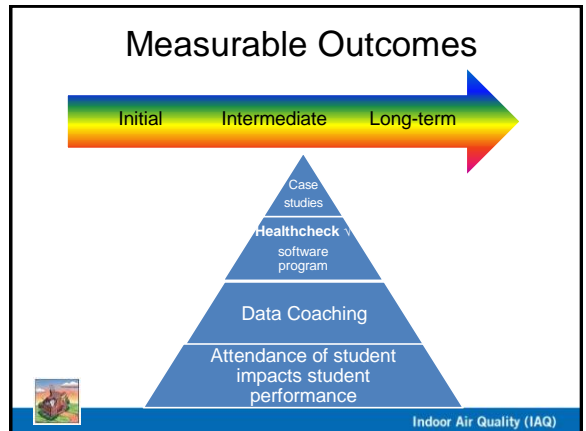
All four sessions for adults were helpful (with GREAT handouts), and my daughter even loved the videos and education for students (plus the rock-climbing wall was a big hit).

Indoor Air Quality (IAQ)

Challenge

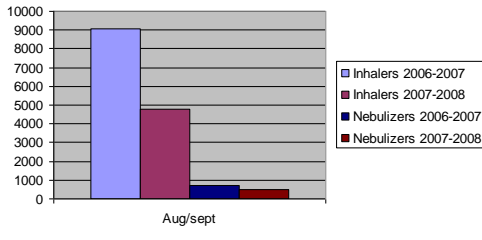
<p>Asthma/Allergy Triggers</p> <ul style="list-style-type: none"> Stuffed things Carpet Over populated Clutter High Particle counts Odors/Smells Mold Infection Control Pests Passive Transmission of allergens Dust mite VOC's 	<p>Technical Solutions</p> <ul style="list-style-type: none"> HVAC Moisture/Mold IPM Cleaning & Maintenance Materials Selection Source Control
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Indoor Air Quality (IAQ)



Results after first year

Comparison of Inhalers/Nebulizers

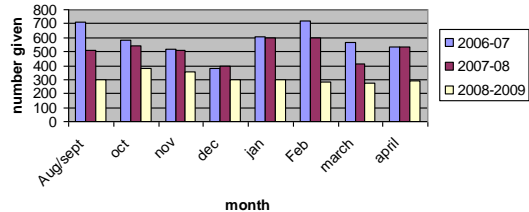


Results of student Inhaler /Nebulizer Usage after initiating 'Tips for a Healthy Classroom' and 'Asthma Trigger Education' began being communicated to staff and Awareness Information to parents. Data comes from the time period of first six weeks of school which is when 'most problematic' allergy seasons are dormant.

Indoor Air Quality (IAQ)

Nebulizer Trends over past Three Years

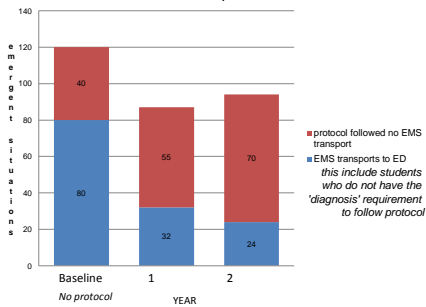
Nebulizer Usage



Comparing three years during same time frame : Aug – end of April data

Indoor Air Quality (IAQ)

Emergency Nebulizer Protocol initial impact



Indoor Air Quality (IAQ)

Green Cleaning Program

Improved attendance of custodial staff due to less respiratory related illnesses

overtime costs reduced overtime by 21.49% -

• \$ 157,000 savings

eliminated the need for temporary hires to cover employee absenteeism -

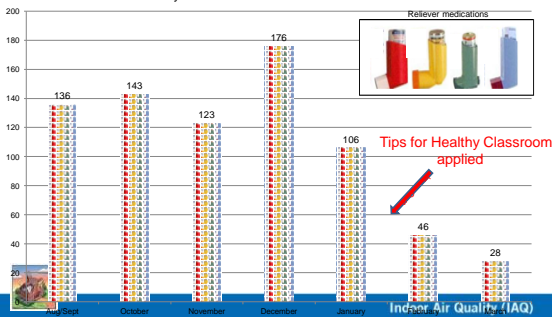
• \$ 470,000 savings

supply costs reduced by 27.54% -

• \$ 328,000 savings

Closer Look at Campus E's clinic visits for PRN inhaler usage.

Benefit seen after applying **Tips for Healthy Classroom**
Greater than 50% decrease in PRN (for symptoms) inhaler usage
In February and an additional 40% decrease in March



Indoor Air Quality (IAQ)

Environmental Intervention

• Environmental assessment found that

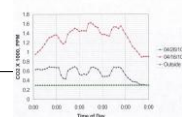
- overuse of aerosolized fragrances in dressing room
- outside ventilation air unit was not in service.

Actions:

- Restoring outside air unit to service provided dilution air to reduce asthma triggers
- fragrance overuse education addressed by trainers in dressing room

Results: Reduction in PRN usage

Month	School Weeks	PRN Inhaler Use	Notes
January	4	17	Outside Air Stopped on 1/15
February	4	41	
March	4	41	
April 5 to 9	1	8	Health check / Software Implemented
April 12 to 16	1	17	
April 19 to 23	1	11	Environmental Assessment performed
April 26 to 30	1	7	Outside Air Restored / Trigger Education
May 3 to 7	1	2	
May 10 to 14	1	5	
May 17 to 21	1	5	



Indoor Air Quality (IAQ)

What did we really do?

SYMPTOM THRESHOLD

- allergens
- irritants
- infection

INFLAMMATION ↑

SYMPTOM THRESHOLD

HVAC
Moisture/Mold
IPM
Cleaning & Maintenance
Materials Selection
Source Control

Indoor Air Quality (IAQ)

Community Support

An Email from a Parent to the Superintendent:

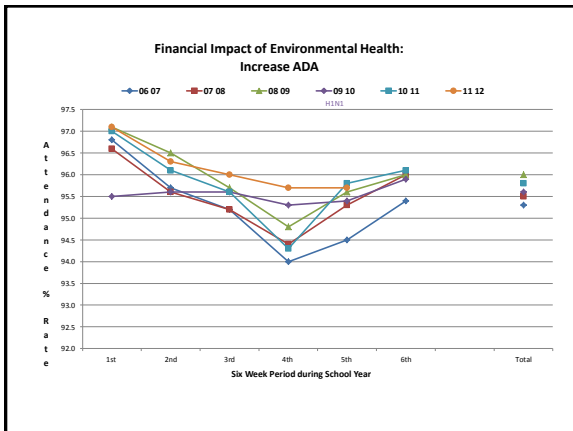
Dr. Middleton,

I am just delighted to see the interest that NEISD has taken in Asthma Awareness. I have a daughter who will be starting Kindergarten next year at Roan Forest Elementary. She has asthma and I have been concerned about the classroom air environment and also whether or not she could be cared for sufficiently while she was in school.

My daughter's consistent attendance at school is important to her being able to learn. Providing an environment that helps prevent asthma attacks makes consistent attendance more possible.

Thank you for this proactive measure that is so important to the many families who deal with asthmatic children. It is greatly appreciated.

Indoor Air Quality (IAQ)



Attendance Funding → Gains / Benefit

Number of asthmatics in NEISD schools 11.735%	×	Average number of school days missed due to asthma (CDC) 8	×	Attendance daily rate by state \$32.00	=	Potential revenue LOST \$2,063,616.00
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Benefits possible when Asthma /Allergy Control Environmental measures applied:

Reducing average number of schools days missed due to asthma by 50%..... \$ 1,031,808.00

Improving all asthmatics attendance by only ONE day.... \$ 257,952.00

Indoor Air Quality (IAQ)

Texas Accountability Ratings

Texas Rating	2007	2008	2009	2010	2011***
Exemplary	9	19	28	24	16
Recognized	28	28	25	30	24
Acceptable	23	15	11	8	25
Unacceptable	1	0	0	0	0

NEISD achieved the "Recognized" District Rating for the FOURTH year in a row.

***Among the notable changes in this year's rating system was the system rated more students than in previous years. For example, All talented special education students are now factored into the formulas, which was not the case in years prior. Commanded and English Language Learners (ELL) performances are also new factors used in determining campus and district ratings... (Percentage floor of achieving / passing must be reached).

Standards for the academically acceptable rating increased for math and science by 10%.

Indoor Air Quality (IAQ)

EPA Tools for Schools Award Program


For schools or school districts that have:

- Taken the initial step in effective IAQ management by describing their current actions, commitment toward comprehensive IAQ management program

The IAQ TIS National Leadership Award recognizes schools and schools districts that have committed to providing a healthy and safe environment for students and staff as demonstrated by:


- Senior-level commitment to establish and maintain a sustainable IAQ program.
- Relating your school IAQ strategies to the Framework for Effective School IAQ Programs

Indoor Air Quality (IAQ)



EPA IAQ TTS 2008 National Excellence Award is to demonstrate that your program incorporates the Framework for School IAQ Program Success

These programs consistently demonstrate a commitment to student and staff health and wellness and have proven that a proactive IAQ management program can have a positive, lasting impact on the school, the staff and students, and the entire community.




National IAQ TTS 2008 Special Achievement Award are individuals that demonstrate a significant dedication to student and staff health and wellness, and have taken steps to leave a positive, lasting impact on school buildings, staff and students and the entire community

EPA IAQ TTS 2009 Mentoring Award is for helping other School Districts to develop a School IAQ Program

- EPA National Symposium Presentations
 - Faculty ISD, Green Cleaning, & Asthma in Schools
- National AASA / ASBO Conferences
- Hosting Regional EPA/CEFP1 conference
- Webinars, Site Visits
- School Nurse conferences

Indoor Air Quality (IAQ)




EPA IAQ TTS 2010 Model of Sustained Excellence Award is for demonstrating that the District has a Sustainable School IAQ Program

- Districts must demonstrate how they have sustained their IAQ practices, established IAQ management goals, and tracked short-term and long-term progress on IAQ management.

Indoor Air Quality (IAQ)

- System that gathers relevant data/information
- **Data drives change**
- Performance
- Attendance
- Healthier Children Learn Better

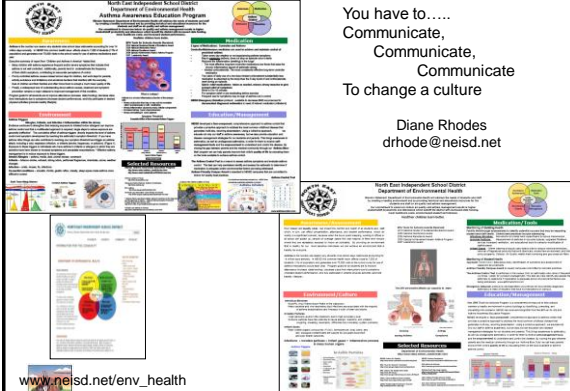


EPA Six Key Driver Framework

Indoor Air Quality (IAQ)

You have to.....
 Communicate,
 Communicate,
 Communicate
 To change a culture

Diane Rhodes
 drhode@neisd.net



www.neisd.net/env_health

Indoor Air Quality (IAQ)