Indoor Air Quality Voluntary Programs

U.S. Environmental Protection Agency (EPA)
Office of Radiation and Indoor Air
www.epa.gov/iaq

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It's As Big As All Outdoors…

- **High exposures**

  >90% of time spent indoors

  pollutant concentrations 2-5X >outdoor concentrations

- **Among Top Five Environmental Risks**

  EPA Scientists, EPA Science Advisory Board (SAB)

- **High economic costs in the U.S.**

  $150,000,000,000 –

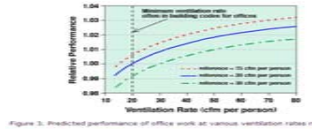
  200,000,000,000 dollars/year

Cross-Cutting Themes from EPA's Program Areas

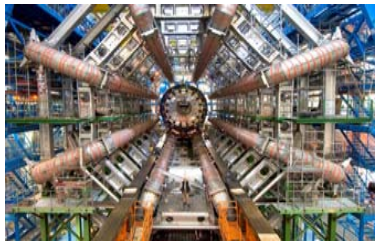
- Using voluntary IAQ guidance & initiatives to improve public health
- Goal-oriented information & action campaigns
- Focus on children's health & underserved populations

Indoor Environments Program Strategy

4 - Measures & Results



1 - Science



3 - Systems for Achieving Results

Strategic Focus

2 – Guidance & Policy Development

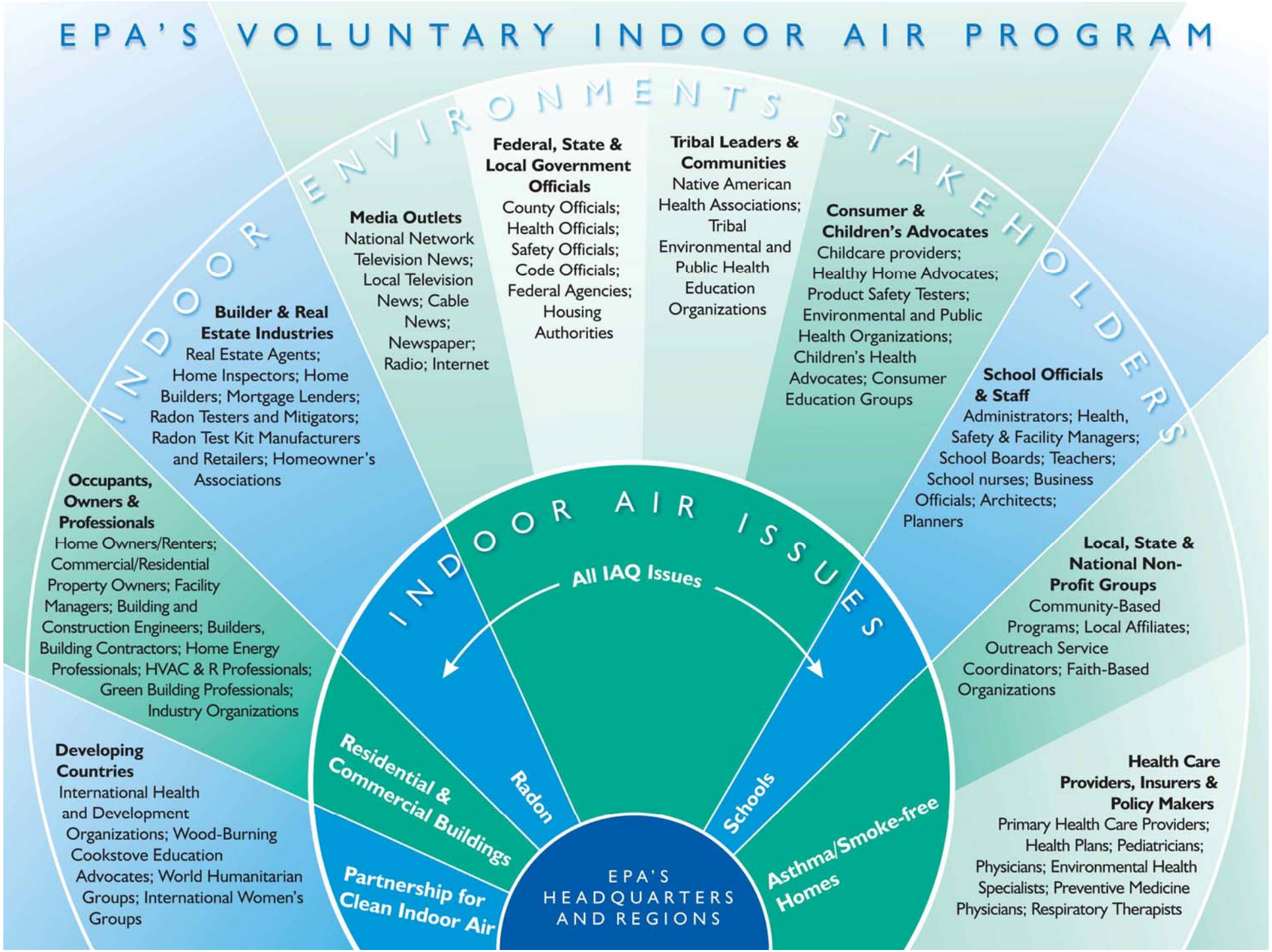
An Interdependent System for Achieving the Risk Reduction Mission

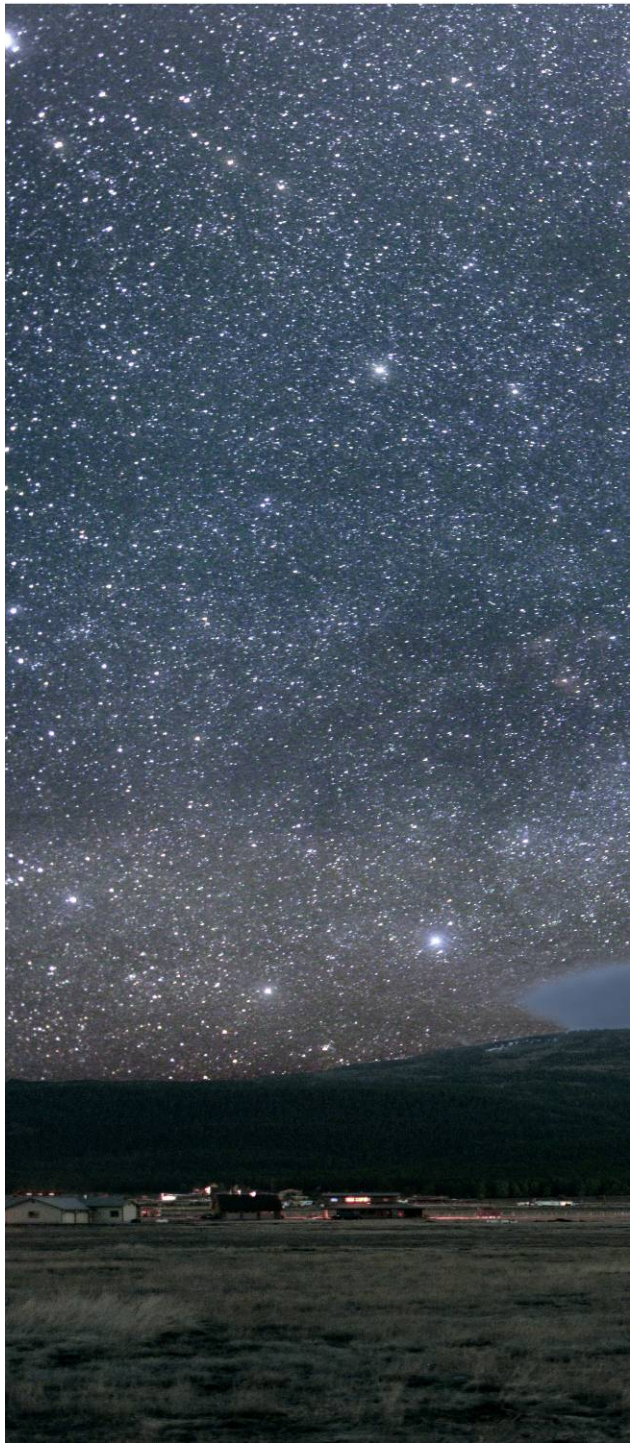
System to Build Capacity for Effective Community Action

Knowledge Management	❖ Capture current knowledge & IAQ management best practices grounded in research ❖ Recognize success and highlight best practices ❖ Tools & Resources ❖ Awards Program ❖ Research
Networking	❖ Leverage stakeholders and champions to expand and support communities - Local, State, Federal & Nonprofit organizations - Partners - Local Affiliates & Coalitions - Professional organizations - Public & Environmental Health Community - EPA Regions - Tribal Nations - Faculty, Champions, Mentors, Trainers
Action Learning	❖ Create platforms to rapidly transfer knowledge and field-tested strategies ❖ Engage and equip communities to take action, improve, and sustain IAQ management programs ➢ National, Regional and Local Pacing Events ➢ Webinars, discussion forums, mentorships

CIAQ
Federal Interagency
Committee on Indoor Air Quality

GREEN INDOOR
ENVIRONMENTS
www.epa.gov/iaq/greenbuilding
PROGRAM


EPA'S VOLUNTARY INDOOR AIR PROGRAM
INDOOR ENVIRONMENTS STAKEHOLDERS
Builder & Real Estate Industries
Real Estate Agents; Home Inspectors; Home Builders; Mortgage Lenders; Radon Testers and Mitigators; Radon Test Kit Manufacturers and Retailers; Homeowner's Associations
Media Outlets
National Network Television News; Local Television News; Cable News; Newspaper; Radio; Internet
Federal, State & Local Government Officials
County Officials; Health Officials; Safety Officials; Code Officials; Federal Agencies; Housing Authorities
Tribal Leaders & Communities
Native American Health Associations; Tribal Environmental and Public Health Education Organizations
Consumer & Children's Advocates
Childcare providers; Healthy Home Advocates; Product Safety Testers; Environmental and Public Health Organizations; Children's Health Advocates; Consumer Education Groups
School Officials & Staff
Administrators; Health, Safety & Facility Managers; School Boards; Teachers; School nurses; Business Officials; Architects; Planners
Occupants, Owners & Professionals
Home Owners/Renters; Commercial/Residential Property Owners; Facility Managers; Building and Construction Engineers; Builders, Building Contractors; Home Energy Professionals; HVAC & R Professionals; Green Building Professionals; Industry Organizations
Local, State & National Non-Profit Groups
Community-Based Programs; Local Affiliates; Outreach Service Coordinators; Faith-Based Organizations
Developing Countries
International Health and Development Organizations; Wood-Burning Cookstove Education Advocates; World Humanitarian Groups; International Women's Groups
Health Care Providers, Insurers & Policy Makers
Primary Health Care Providers; Health Plans; Pediatricians; Physicians; Environmental Health Specialists; Preventive Medicine Physicians; Respiratory Therapists
INDOOR AIR ISSUES
All IAQ Issues
Radon
Residential & Commercial Buildings
Partnership for Clean Indoor Air
Schools
Asthma/Smoke-free Homes
EPA'S HEADQUARTERS AND REGIONS



EPA Indoor Air Quality (IAQ) program areas & priorities

Residential Guidance – home IAQ label program (Indoor Air Plus)

Commercial / Institutional Guidance – best practices guidance documents

Climate Change and IAQ - guidance and research

IAQ Research Needs - includes ventilation & energy efficiency, source reduction, filtration, performance/ productivity, asthma, mold

Science Support – Scientific Findings Resource Bank, BASE study analysis

Emerging Issues – such as nanotechnology

Asthma – control indoor environmental triggers of asthma

Schools – comprehensive IAQ management, IAQ Tools for Schools

Mold - focus on prevention, moisture control

Radon – residential focus -- radon resistance new construction

Partnership for Clean Indoor Air (PCIA) – international cookstove initiative


EPA programs
&
resources

Radon

Long term goal – *By 2012, prevent 1250 future cancer deaths annually through the mitigation of existing homes and the construction of new radon resistant homes*.

- Second-Leading Cause of Lung Cancer, leading cause among non-smokers

- > 20,000 U.S. Deaths/ Year
  - 50% Increase from Previous Estimate
  - Non-Smokers at 4x the Risk

- Lifetime Risk at Action Level
  (4 picoCuries per liter --4pC/l)
  - Smokers: 6/100 ($6x10^{-2}$)
  - Never Smokers: 7/1000 ($7x10^{-3}$)

- Cost per life saved is low ($475,000)

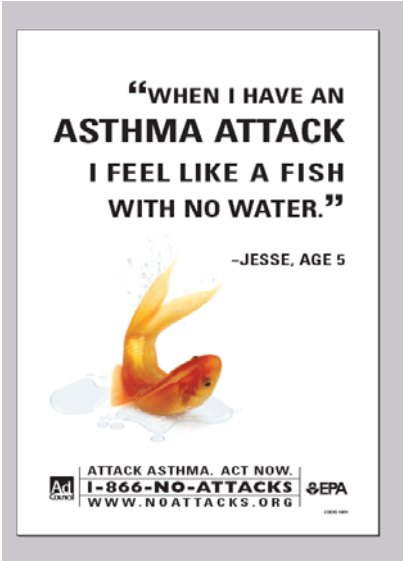
Radon Program continued
We've Done A Lot. . .And Are Doing More

- Estimated 645 Lives Saved Annually (2006)
- 714K of almost 6M "High" Homes Fixed (2006)
- Radon Resistant New Homes:
  - > 1 million New High Risk Homes through 2007
  - > 100,000 Radon Resistant New Homes annually
- New Activities:
  - Radon Leaders Saving Lives Campaign
  - Rn Web Portal – EPA website, Knowledge Base
  - New public service announcements

Asthma

Long term goal – ***By 2012, 6.5 million people taking essential actions to control exposures to their environmental triggers***

- Burden >22 million, including 6.8 million children
  - 2 million emergency room visits &13 millions missed school days/ year
  - Significant disparities/underserved population
- Environmental triggers
  - environmental tobacco smoke, mold, dust mites, pets, cockroaches…
  - outdoor ozone & PM



Asthma continued

Multi-faceted program:

-- "Goldfish" Public Service Advertising Campaign
-- Health care / Health plan partnerships
-- National action learning network of community-based programs and nonprofit organizations

- Program Results
  - 4 million people taking essential actions,
    - averting > 50,000 emergency room visits /year
  - 280 community-based programs in asthma network
    - 27% of health plans supporting environmental management
    - >2000 health care professionals trained annually

Smoke-free Homes and Cars

Long Term Goal - ***By 2012, reduce the percent of low-income and minority children aged 6 and under regularly exposed to environmental tobacco smoke in the home to be equivalent with rates in the general population***

- Environmental Tobacco Smoke (ETS) - 3,500 Lung Cancer Deaths Per Year; also cardiovascular disease, asthma, pneumonia, bronchitis, ear infections

Smoke-free Homes and Cars

continued

- Smoke-Free Homes and Cars to reduce children's exposure is a unique niche for EPA (Head Start relationship/DOT relationship)

- Program Results – Young children exposed to ETS at home reduced from 27% in 1994 to 8% in 2005

Schools

Long term goal – ***By 2012, 35% of primary and secondary schools (over 40K schools) will implement an effective indoor air quality management plan (22% of schools as of 2002).***

- In mid-90s, nearly half of nation's kindergarden - grade12 schools with IAQ-related problems
- IAQ Tools for Schools (IAQ TfS) Program launched to help schools identify, solve and prevent IAQ problems in school buildings

www.epa.gov/iaq/schools

Schools continued

- IAQ TfS program is driving a national action learning network of schools that leverages peer leadership to increase results

- Program Results: As of 2006, 50,000 schools have IAQ Management Plans based on IAQ Tools for Schools

- Cross-agency schools work, collaboration/ EPA Office of Childrens' Health
  - Healthy School Environments Web Site
  - HealthySEAT

www.epa.gov/schools/

HealthySEAT
Healthy School Environments Assessment Tool

International Partnership for Clean Indoor Air (PCIA)

- ~3 billion people (1/2 of world's population) burn traditional fuels indoors for home cooking & heating.
- >1.6 million people, mainly women and children die prematurely each year from breathing indoor smoke.
- Partnership includes 190 public & private organizations in 67 countries.
- EPA coordinates, sponsors capacity building at regional and local level, & provides small grants to pilot & scale-up programs
- Partnership has resulted in more than 1.2 million homes with improved cooking technology

www.epa.gov/iaq/pcia.html

Science

BASE Data Available

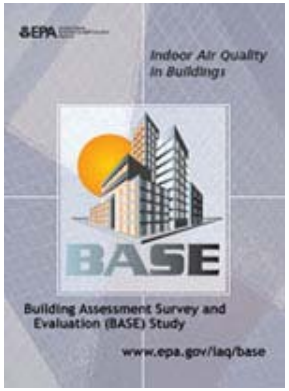
www.epa.gov/iaq/base

The Building Assessment, Survey and Evaluation (BASE) study was a cross-sectional study of 100 randomly selected office buildings in the U.S.

www.epa.gov/iaq/base/summarized_data.html

Environmental Monitoring

Particles (PM10, PM2.5)
VOCs
Formaldehyde
Bioaerosols
Radon
Temperature
Relative Humidity
Carbon Dioxide
Sound, Light
Carbon Monoxide



HVAC Characteristics

Filtration
Air Cleaning Systems
Humidification Systems
Maintenance Schedule
Inspection Schedule
Supply Air Flow Rate
Percent Outdoor Air
Outdoor Air Intake Rate
Supply Air (temperature, relative humidity)
Exhaust Fan Rates
Local Ventilation Performance

Occupant Survey

Health and Well-being
Environmental Conditions
Job Characteristics
Occupant Demographics

IAQ Scientific Findings Resource Bank

Current Topics:

Health and Economic Impacts of Building Ventilation

Impacts of Indoor Environments on Human Performance and Productivity

Indoor Dampness, Mold, and Health

Indoor Volatile Organic Compounds (VOCs) and Health

http://eetd.lbl.gov/ied/sfrb/

Developed under an interagency agreement between the
U.S. Environmental Protection Agency and the
U.S. Department of Energy - Lawrence Berkeley National Laboratory.

Indoor Air Quality Guide: Best Practices for Design, Construction, and Commissioning

for commercial and institutional buildings

Collaborating organizations:

ASHRAE - American Society of Heating, Refrigerating & Air-Conditioning Engineers
AIA - American Institute of Architects
USGBC - U.S. Green Building Council
BOMA - Building Owners and Managers Association
SMACNA - Sheet Metal and Air Conditioning Contractors of North America
U.S. EPA - Environmental Protection Agency

- ASHRAE awarded 3-yr cooperative agreement /EPA to develop the guide

- 90% draft in progress – see ASHRAE website www.ashrae.org

www.ashrae.org

New EPA label for homes

Indoor Air Plus

EPA Residential Guidance Focuses on Prevention

Components Include:

Source Control

Ventilation

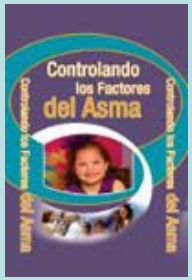
Moisture Control

Examples of EPA guidance materials

Free outreach materials - booklets, videos etc. on EPA website

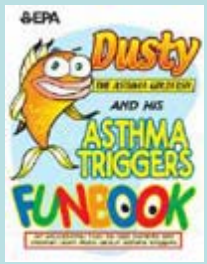
Customize &
print your own stock

EPA guidance and text is not copyrighted, it is available for use & adaptation by public health officials and others

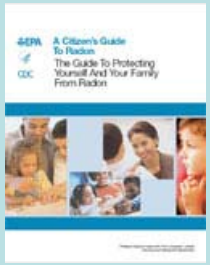


Controlando los factores del asma
(Controlling asthma triggers video)

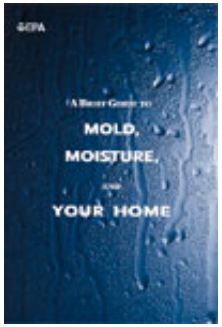
Guide to Air Cleaners in the Home
(booklet)



…Asthma Triggers Funbook
(for children)

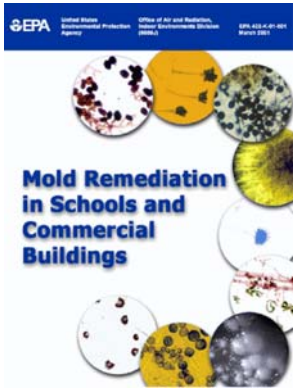


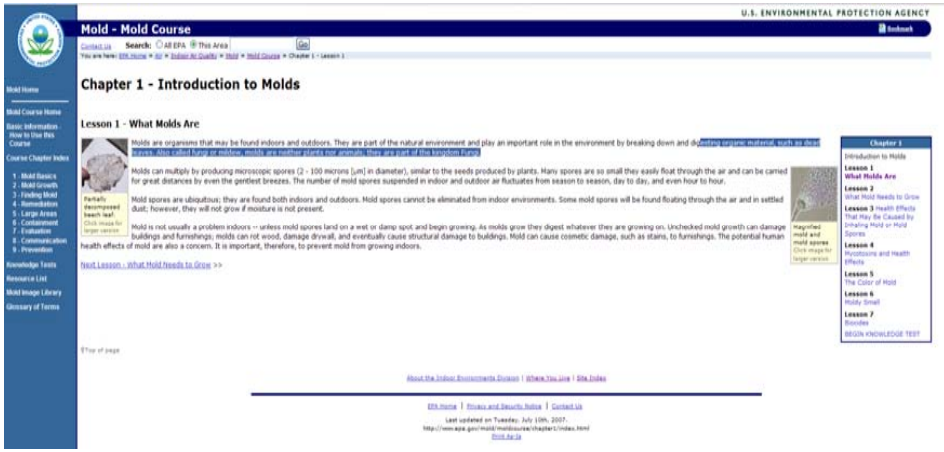
A Citizen's Guide to Radon
(booklet)



Mold publications

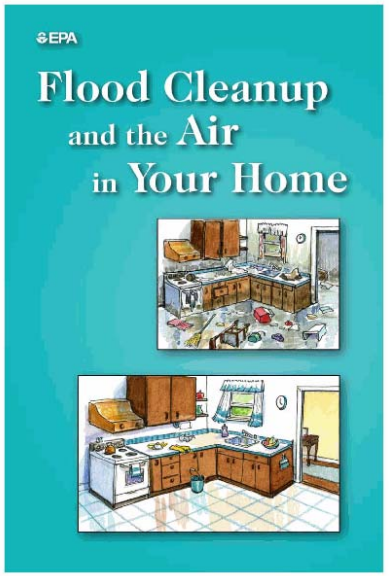
www.epa.gov/mold





Mold Course

www.epa.gov/iaq/flood



- Flood booklet and poster available

- English, Spanish,Vietnamese versions

- print files online
  for desktop printer
  for professional print jobs

-customize and print your own stock

ATTACK ASTHMA. LEARN MORE.

www.epa.gov/asthma

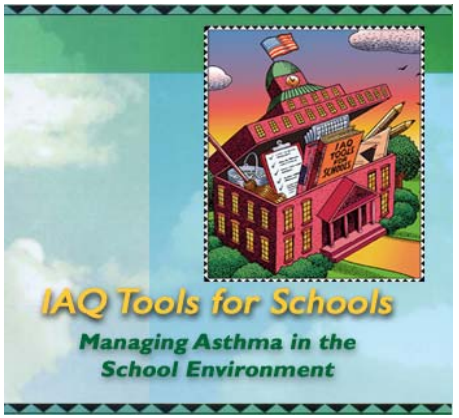
Control indoor environmental triggers of asthma

Program components:

Community Outreach and Education
National Public Awareness Campaigns
Science Support

www.epa.gov/iaq/schools

IAQ Tools for Schools



IAQ Design Tools for Schools

www.epa.gov/radon

In summary, some elements of successful voluntary IAQ programs in the U.S.

- Use science to guide development of policy and best practices
- Collaborate on programs and outreach -- Influence/ participate in/ provide/ encourage training & guidance for professionals & the public
- Track progress and results
- Refine messages and goals/ input from multiple sources
- Recognize successes and value partnerships/ collaborations
- Guide research

Institutionalize good IAQ practices

- Work with nonprofit organizations, professional associations, public health groups, local/ State/ Federal organizations
- Provide online, best practices materials and guidance documents
- Use public service announcements and campaign materials
- Use “train the trainer” model
- Reinforce & spread success with recognition programs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