School Environmental Health and Safety Program

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Office of Environmental Health and Safety
May 12, 2016
Washington State Department of Health
School Environmental Health & Safety Program

Our Mission

To protect and improve the Environmental Health and Safety condition of schools in Washington state.
DOH School Environmental Health & Safety Program

Provide technical support & training
- Local Health Jurisdictions (LHJs)
- Schools

Authority
- RCW 43.20.050(2)(c) Adopt rules controlling public health related to environmental conditions including but not limited to heating, lighting, ventilation, sanitary facilities, cleanliness and space in all types of public facilities including but not limited to food service establishments, schools, institutions, ...
- WAC 246–366
- DOH / OSPI K12 Health & Safety Guide
WAC 246-366

- 030 Site Approval
- 040 Plan Review & Inspections
- 050 Buildings
- 060 Plumbing, Water Supply, & Fixtures
- 070 Sewage Disposal
- 080 Ventilation
- 090 Heating
- 100 Temperature Control
- 110 Sound Control
- 120 Lighting
- 130 Food Handling
- 140 Safety
Partners & Associates (some)

- 35 Local Health Jurisdictions
- 295 School Districts, private and tribal schools
- 9 Educational Service Districts (ESDs)
- Risk Managers and Insurance Carriers
- School Nurses
- Office of The Superintendent of Public Instruction (OSPI) School Facilities, Safety Center, School Nurse Corp
- Federal Agencies: EPA, ATSDR, CDC, NIOSH, PEHSU
- UW and WSU
- DOH Partners
  - Zoonotic Diseases & Pesticides
  - Site Assessment & Toxicology
  - Epidemiology – CD & ENV
  - Injury Prevention Group
  - Prevention and Community Health
Local Health Jurisdictions (LHJs) with school inspection programs

- Snohomish
- Thurston
- Pierce
- Kittitas
- NE Tri County
- Spokane
- Island
- Pacific
- New in 2015
- Walla Walla
- Coming soon!
- Clark
School Environmental Health and Safety

- Animals
- Control of Communicable & Zoonotic Diseases
  - Disinfection and Green Cleaning
- Hazardous Chemicals
  - Arts, Science Labs, CTE
- Indoor Air Quality
  - Asthma, Mold, Ventilation, Filtration
- Injury Prevention
  - Athletics, Playgrounds, Fall Protection
- Integrated Pest Management
- Lighting
- Noise
Air Quality

- Air Pollution and School Activities Guide (PDF)
- Asthma and Schools
- Good Ventilation is Essential for a Healthy and Efficient Building, WSU (PDF)
- Healthy Air Quality in Schools – Tips for Administrators, Custodians, and Teachers
- Improving Indoor Air Quality in King County Schools, Local Hazardous Waste Management Program in King County
- Improving Ventilation during Wildfire Smoke Events (PDF)
- Indoor Air Quality Tools for Schools, EPA
- Indoor Air Quality Topics
- Measuring Carbon Dioxide Inside Buildings, WSU (PDF)
- Responding to Indoor Air Quality Concerns in our Schools, 2005 (PDF)
School Environmental Health and Safety  
www.doh.wa.gov/schoolenvirenment

**Biological Issues**

- Animals in Public Settings Compendium, NASPHV
- Classroom Cleaning - Tips for Teachers
- Infectious Disease Control Guide for School Staff, OSPI, 2014 (PDF)
- Integrated Pest Management for Schools, WSU
- Mold Remediation in Schools and Commercial Buildings, EPA
- MRSA (Methicillin-resistant Staphylococcus aureus)
- Pests - Bed Bugs, Bees, Lice, Rodents

**Career and Technical Education, Art, and Science**

- Art Hazards, Local Hazardous Waste Management Program in King County
- Career and Technical Education Health and Safety Education Guide, OSPI, 2009 (PDF)
- Lab Safety Videos, Local Hazardous Waste Management Program in King County
- School Chemical List, Local Hazardous Waste Management Program in King County
- Teen Workers, L&I
School Environmental Health and Safety

www.doh.wa.gov/schoolenvironment

Contaminants

- Contaminants such as Lead, Mercury, and Asbestos
- Lead Care II Loaner Program
- Mercury in Schools
- Pesticides and Schools

Facilities and Construction

- Children's Health & the Built Environment, CDC
- High Performance School Building Program, OSPI

Playgrounds and Playfields

- Public Playground Safety Handbook, CPSC (PDF)
- Public Playground Safety Checklist, CPSC
- Synthetic Turf Containing Crumb Rubber

Rules and Regulations

- Chapter 246-366 WAC, Primary and Secondary Schools
- School Rule Revision, State Board of Health
School Environmental Health and Safety

www.doh.wa.gov/schoolenvironment

Student Health and Safety

- A-Z Health Topics, OSPI
- Children's Health Protection at School, EPA
- Concussion Management for School Sports
- Emergency Preparedness and Response
- How to Respond to Injury and Illness at School, OSPI/DOH (PDF)
- Wi-Fi Safety Concerns in Our Schools

Content Source: School Environmental Health and Safety Program
Some of the things I work on
Indoor Air Quality Principals

- Source Control
- Ventilation

“If there is a pile of manure in the room, do not try to remove the odor by ventilation. Remove the pile of manure.”

Max Joseph Von Pettenkofer, 1818–1901
Indoor Air Quality

Indoor air quality can have a significant effect on your health. Studies show that people spend 65 to 90 percent of their time indoors, and indoor air can be two to five times more polluted than outdoor air. The young, elderly, chronically ill, and those with respiratory or cardiovascular disease are often the most impacted by poor indoor air quality.

- Asbestos
- Asthma
- Bleach Mixing Dangers
- Carbon Monoxide
- E-Cigarettes and Vaping
- Fiberglass
- Formaldehyde
- Hiring an Investigator or Contractor
- Mercury
- Mold
- Outdoor Air
- Pesticides
- Radon
- Renters, Landlords, and Mold
- School Indoor Air Quality
- Tobacco Smoke
- Vapor Intrusion

Fresh Air for a Healthier Home, Guide to Ventilation Systems

More Resources

- Green Cleaning and Toxic Free Tips - Department of Ecology
- Free Home Health Assessment for Seattle/King County Area - American Lung Association
- Local Clean Air Agencies
- Indoor Air Quality - EPA

Content Source: Indoor Air Quality Program

Also my responsibility
www.doh.wa.gov/iaq
## Air Quality Conditions

First, check local air conditions at [https://fortress.wa.gov/ecy/enviwa/](https://fortress.wa.gov/ecy/enviwa/) and then use this chart.

<table>
<thead>
<tr>
<th>Good</th>
<th>Moderate</th>
<th>Unhealthy for Sensitive Groups</th>
<th>Unhealthy</th>
<th>Very Unhealthy/Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recess</strong> (15 minutes)</td>
<td>No restrictions.</td>
<td>Keep students with asthma, respiratory infection, lung or heart disease indoors.</td>
<td>Keep all students indoors and keep activity levels light.</td>
<td>Keep all students indoors and keep activity levels light.</td>
</tr>
<tr>
<td><strong>P.E.</strong> (1 hour)</td>
<td>Monitor students with asthma, respiratory infection, lung or heart disease. Increase rest periods or substitutions for these students as needed.</td>
<td>Limit to light outdoor activities. Allow any student to stay indoors if they don't want to go outside. Keep students with asthma, respiratory infection, lung or heart disease, and diabetes indoors. Limit these students to moderate activities. Students with asthma should follow their Asthma Action Plan.</td>
<td>Conduct P.E. indoors. Limit students to light indoor activities. Students with asthma should be following their Asthma Action Plan.</td>
<td>Keep all students indoors and keep activity levels light. Students with asthma should be following their Asthma Action Plan.</td>
</tr>
<tr>
<td><strong>Athletic Events and Practices</strong> (Vigorous activity 2-3 hours)</td>
<td>No restrictions. Monitor students with asthma, respiratory infection, lung or heart disease. Increase rest periods and substitutions for these students as needed. Students with asthma should follow their Asthma Action Plan.</td>
<td>Consider moving event indoors. If event is not cancelled, increase rest periods and substitutions to allow for lower breathing rates. Students with asthma, respiratory infection, lung and heart disease, or conditions like diabetes shouldn't play outdoors. Students with asthma should follow their Asthma Action Plan.</td>
<td>Cancel the event. Or move the event to an area with &quot;Good&quot; air quality — if this can be done without much time spent in transit through areas with poor air quality.</td>
<td>Cancel the event. Or move the event to an area with &quot;Good&quot; air quality — if this can be done without much time spent in transit through areas with poor air quality.</td>
</tr>
</tbody>
</table>

**Light Activities:** Playing board games, throwing and catching while standing, and cup stacking.

**Moderate Activities:** Yoga, shooting basketballs, dance instruction, and ping pong.

**Vigorous Activities:** Running, jogging, basketball, football, soccer, swimming, cheerleading, and jumping rope.

Mold

- Leaks, inadequate ventilation, poor drainage, Condensation, high humidity.
- Irritation, allergic reactions, infections
- Fix all causes of moisture accumulation
- Prevention – Keep it dry
Playgrounds
Certified Playground Safety Inspector

- Corrosion, wearing, opening of closures
- Pinch & crush hazards
- Head entrapment
- Protrusions
- Impalement
- Entanglement
Integrated Pest Management

- UPEST – Urban Pesticide Education Education Strategies Team
  - WSU, EPA, DOH, ECY, WSDA, NEESD, Eden
- Guidelines for Schools Next to Agricultural Operations
- School Gardens
- IPM for Microorganisms: Cleaning, Disinfecting, and Sanitizing
- https://schoolipm.wsu.edu/
Chemistry Labs and Hazard Control
# Hazardous Chemicals in Schools Data Base

## Hazards, Use, Storage

![Local Hazardous Waste Management Program in King County, Washington](image)

## Hazardous Chemicals in Schools

**Home >> Resources for Schools >> Schools Chemical List**

### Search for Chemical Name, Acute/Chronic Exposure Hazard, etc.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Acute Exposure Hazard</th>
<th>Chronic Exposure Hazard</th>
<th>Environmental Toxicity</th>
<th>Hazard Rank</th>
<th>Lowest Grade Level Allowed</th>
<th>Storage Category</th>
<th>Experiments Where Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>No acute toxicity data reported</td>
<td>No confirmed human disease-related or reproductive hazard data reported</td>
<td>No fish toxicity data</td>
<td>1</td>
<td>Elementary demos only</td>
<td>O-1</td>
<td>Botany - effects of plant hormones</td>
</tr>
<tr>
<td>Acetal</td>
<td>Explosion risk from peroxide formation. Flammable. Slightly toxic by ingestion &amp; skin contact. Irritant.</td>
<td>No confirmed human disease-related or reproductive hazard data reported</td>
<td>No fish toxicity data</td>
<td>5</td>
<td>Ban Candidate</td>
<td>O-3 Flam Cabinet</td>
<td>NONE</td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>Explosion risk from peroxide formation.</td>
<td>Liver function impairment</td>
<td>Toxic to fish</td>
<td>5</td>
<td>Ban Candidate</td>
<td>O-3 Flam Cabinet</td>
<td>NONE, Formerly used as: Organic</td>
</tr>
</tbody>
</table>
Art Hazards in Schools

Art Chemical Hazards Project

Many art techniques involve the use of chemicals that can pose risks to human health and the environment if mishandled. The objective of the Art Hazards Project, a project of the Local Hazardous Waste Management Program in King County, is to protect artists’ health and the natural environment in King County from the risks posed by hazardous chemicals in art supplies.

The Art Hazards Project helps identify potentially hazardous chemicals in art supplies and provides information on ways to reduce risks from these chemicals to artists, museum and gallery staff, art educators, and art suppliers through seminars and trainings.

The project team collaborates with artists, art colleges, cooperatives, museums, galleries and suppliers to help artists and art educators understand risks, reduce potential exposures to chemical hazards, and ensure hazardous art materials are properly recycled or disposed when no longer needed.

For more information on the Art Hazards Project or to schedule a training, seminar or initial meeting, contact Dave Waddell at 206-263-3069 or dave.waddell@kingcounty.gov.

Art Supplies – Risks and Alternatives

Selecting Safer Art Adhesives (PDF, 281 KB)

Related Materials

Guidelines for the Safe Use of Art and Craft Materials
http://www.oehha.org/education/art/artguide.html

INFORM - Strategies for a better environment (PDF)
Zoonotic Diseases
Animal Concerns

- **Salmonella**
  - Reptiles
  - Chicks
  - Owl Pellets

- Psittacosis (parrot fever)

- Classroom Pets
  - *Compendium of Measures to Prevent Disease Associated with Animals in Public Settings*

- Rabies
- West Nile Virus
- Hanta Virus
- Lice
- Bed bugs
Worried?

- Clostridium difficile (C. diff)
- Enterovirus D68
- Influenza
- Measles
- MRSA
  *Methicillin Resistant Staphylococcus aureus*
- Norovirus
- Pertussis
  *Whooping Cough*
The Basics

- Wash your hands with plain soap and water – often!
- Cover your cough or sneeze.
- Avoid touching your eyes, nose, or mouth.
- Stay out of spit zones.
- Get vaccinations.
- Good ventilation.
- Stay home when ill.
- Support Public Health.
Local School Credits Handwashing Stations with Drop in Absences

Lake Charles, Louisiana
Posted: Nov 21, 2014 3:50 AM PST, By Britney Glaser, KPLCtv.com

Electric Hand Dryers

“Modern hand dryers are much worse than paper towels when it comes to spreading germs, according to new research. Airborne germ counts were 27 times higher around jet air dryers in comparison with the air around paper towel dispensers.”

“jet–air” and warm air dyers studied

Hand Sanitizers

- Not a substitute for hand washing.
- Not effective on dirty hands.
- At least 60% alcohol.
- Hands should stay wet for 10-15 seconds.
- Not considered effective on non-enveloped viruses/spores.
- Flammable / Poison
- Preferred: Fragrance free.
- Not recommended:
  - Benzalkonium chloride / “quat” based / non-alcohol / “natural”
Good Cleaning Practices

Prevention / Walk-off mats
High efficient vacuum filters
No chemicals brought in by staff/parents
Avoid aerosols / Spray into cloths
Read the MSDS
No upholstered furniture
Clutter control
Control food in classrooms – including snack storage
Nitrile or vinyl gloves, not latex
Microfiber cloths
Clean – Sanitize – Disinfect?

- **Cleaners, Soaps, Detergents**
  - Remove dirt/organics.

- **Sanitizers**
  - Reduce germs from surfaces – 99.9%.

- **Disinfectants**
  - Destroy or inactivate germs and prevent them from growing.

Guidelines for Cleaning, Disinfecting, and Handling Body Fluids in School – Appendix 8

OSPI Infectious Disease Control Guide for School Staff 2014

A. Standard Precautions
B. General Precautions
C. Hand Washing Procedures
D. Use of Gloves
E. Contaminated Needles, Broken Glass, or Other Sharp Items
F. Cardiopulmonary Resuscitation
G. General Housekeeping Practices
H. Disinfectants
I. Procedures for Cleaning and Disinfection of Hard Surfaces
J. Blood or Body Fluid Spills
K. Cleaning up vomit
L. Athletics
M. Procedures for Cleaning and Disinfection of Carpets/Rugs
N. Disposal of Blood–Containing Materials
O. Procedures for Cleaning and Disinfection of Cleaning Equipment
P. Procedures for Cleaning and Disinfection of Clothing and Linens soiled with Body Fluids
Q. Signs and Labels
R. Cleaning and Disinfecting Musical Mouth Instruments
Evaluation of Ultraviolet Germicidal Irradiation in Reducing the Airborne Cultural Bacteria Concentrations in an Elementary School in the Midwestern United States

May 2015 Journal of Environmental Health
Choosing Products

- Third Party Certified (Green Seal, UL GREENGUARD)
- EPA Safer Choice
- Neutral pH
- Low hazard rating
- Use only when and where needed
- Meets or exceeds the California VOC requirements
- Say No
  - phosphates, dye, fragrance, butyl cellusolve, nonylphenol ethoxylate
- Disinfectants – EPA approved for the intended purpose

http://www.epa.gov/oppad001/chemregindex.htm
Special Concerns

- Cake toilet deodorizers
  - paradicholorobenzene
- Citrus & Terpene Solvents
  - D–Limonene
- Nano Technology
  - nano–silver
- “Air Fresheners”
- Ozone generators
- Anti–microbial soaps
  - Triclosan / Triclocarban
Perfumed, Fragranced, & Scented

- Added fragrances can trigger asthma attacks, allergies, sensitization.
- Eye, skin, and respiratory irritation.
- “Fragrance” – a thousand components.
- Limonene, pinenes, acetone, ethanol, camphor, benzyl alcohol, ethyl acetate, limonene, benzene, formaldehyde, 1,4-dioxane, methylene chloride, acetaldehyde, synthetic musks, phthalates, etc.
- Natural oils – lavender, lemon, etc.
- Look for “fragrance-free,” not “unscented”.
FIG. 1. Descending order of resistance to antiseptics and disinfectants. The asterisk indicates that the conclusions are not yet universally agreed upon.

Source: McDonnell & Russell, 1999
## Safer Products and Practices for Disinfecting and Sanitizing Surfaces
San Francisco Department of the Environment

### Table 1. Summary of Health and Environmental Attributes of 11 Active Ingredients Commonly Found in Surface Disinfectants and Non-food Contact Sanitizers

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CANCER</th>
<th>REPRODUCTIVE TOXICITY</th>
<th>ASTHMA</th>
<th>SKIN SENSITIZATION</th>
<th>AQUATIC TOXICITY</th>
<th>PERSISTENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caprylic Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Med acute</td>
<td>Low</td>
</tr>
<tr>
<td>Citric Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>Hydrogen Peroxide</td>
<td>No&lt;sup&gt;1&lt;/sup&gt;</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>High acute</td>
<td>Low</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>Ortho-Phenylphenol (OPP)</td>
<td>Known</td>
<td>Suspected</td>
<td>No</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Peroxyacetic Acid (PAA)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Pine Oil</td>
<td>No&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No</td>
<td>No&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>Quaternary Ammonium Chloride Compounds (Quats)</td>
<td>No</td>
<td>Suspected</td>
<td>Yes</td>
<td>One compound&lt;sup&gt;4&lt;/sup&gt;</td>
<td>High acute, med</td>
<td>Very High</td>
</tr>
<tr>
<td>Silver</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>High acute</td>
<td>Very High</td>
</tr>
<tr>
<td>Sodium Hypochlorite (Chlorine Bleach)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Thymol</td>
<td>No</td>
<td>No&lt;sup&gt;5&lt;/sup&gt;</td>
<td>No</td>
<td>Yes</td>
<td>High acute</td>
<td>Low</td>
</tr>
</tbody>
</table>
**Disinfecting and Sanitizing with Bleach**

**Guidelines for Mixing Bleach Solutions for Child Care and Similar Environments**

### Preparation Tips
- **Prepare** a fresh bleach solution each day in a well-ventilated area that is separate from children.
- **Label** bottles of bleach solution with contents, ratio and date mixed.
- **Use cool water.** Always add bleach to cool water, **NOT** water to bleach.
- **Wear** gloves and eye protection.
- **Prepare** solution in an area with an eye wash.

### Disinfecting Solutions

- For use on diaper change tables, hand washing sinks, bathrooms (including toilet bowls, toilet seats, training rings, soap dispensers, potty chairs), door and cabinet handles, etc.

<table>
<thead>
<tr>
<th></th>
<th>Water</th>
<th>Bleach Strength*</th>
<th>Bleach Strength*</th>
<th>Bleach Strength*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.75%</td>
<td>5.25-6.25%</td>
<td>8.25%</td>
<td></td>
</tr>
<tr>
<td>1 Gallon</td>
<td>1/3 Cup, plus 1 Tablespoon</td>
<td>3 Tablespoons</td>
<td>2 Tablespoons</td>
<td></td>
</tr>
<tr>
<td>1 Quart</td>
<td>1 1/2 Tablespoons</td>
<td>2 1/4 Teaspoons</td>
<td>1 1/2 Teaspoons</td>
<td></td>
</tr>
</tbody>
</table>

### Sanitizing Solutions

- For use on eating utensils, food use contact surfaces, mixed use tables, high chair trays, crib frames and mattresses, toys, pacifiers, floors, sleep mats, etc.

<table>
<thead>
<tr>
<th></th>
<th>1 Gallon</th>
<th>1 Tablespoon</th>
<th>2 Teaspoons</th>
<th>1 Teaspoon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Quart</td>
<td>1 Teaspoon</td>
<td>1/2 Teaspoon</td>
<td>1/2 Teaspoon</td>
</tr>
</tbody>
</table>

Disinfection of non-porous non-food contact surfaces can be achieved with 600 parts per million (ppm) of chlorine bleach. To make measuring easier, the strengths listed in this table represent approximately 600-800 ppm of bleach for disinfecting, and approximately 100 ppm for sanitizing. Chlorine test strips with a measuring range of 0-800 ppm or higher can also be used to determine the strength of the solution.

**Contact your local health jurisdiction** for further instructions on cleaning and disinfecting if specific disease or organisms are identified as causing illness in your program.

*Use only plain unscented bleach* that lists the percent (%) strength on the manufacturer’s label. Read the label on the bleach bottle to determine the bleach strength. For example, Sodium Hypochlorite...6.25% or 8.25%.

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**Steps to Follow**
- **Clean** the surface with soap and water before disinfecting or sanitizing.
- **Rinse** with clean water and dry with paper towel.
- **Apply** chlorine bleach and water solution to the entire area to be disinfected or sanitized.
- **Air dry** for at least 2 minutes.

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This chart was created by the Disinfection Workgroup led by the Washington State Department of Health. Workgroup members consist of staff from the Department of Early Learning, Snohomish Health District, Local Hazardous Waste Management Program in King County, Washington State Department of Transportation, and Washington State University Puyallup Research and Extension Center.
Thank You

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360–236–3072

Resources available:
www.doh.wa.gov/schoolenvironment
Join my list serve for timely information!