Asthma, Environmental Health & Infection Control in Schools
The Project

VDH has contracted Informed Green Solutions to assist schools with the following:

- Conduct environmental assessments
- Promote plans & policies to reduce environmental impacts
- Increase knowledge to reduce Covid-19 transmission
- Adopt best practices for safe cleaning, sanitizing & disinfecting
- Prevent harmful chemical exposures
- Address the causes and management of asthma
Trainings & Technical Assistance

• Backgrounds:
  • 30+ years experience in K-12 & childcare
  • Administered VOSHA programs
  • Civil Service - Haz-Mat/Environmental Compliance
• Pioneered Cleaning for Health Program throughout the NE
• Worked with:
  • 150+ VT K-12 schools
  • Hospitals
  • Colleges/Universities
  • Elder Care
  • Childcare
Vermont’s 2012 Act 68 requires cleaning products* provided or sold to K-12 schools be 3rd-party-certified as safer. Training by vendors mandated.

Available through the state contracts with the Department of Buildings & General Services or directly from vendors

Third-party certifiers:
EPA Safer Choice
Green Seal
UL ECOLOGO®

* General purpose cleaners, bathroom cleaners, glass cleaners, carpet cleaners, floor care products, air fresheners, & hand soaps.
A 2022 study of 650 SDS’s found:

- 30% included inaccurate hazard warnings, including cancer risks.
- In products containing carcinogens, 15% failed to warn of cancer risks.
- In products containing reproductive toxins, 21% failed to warn of risks to fertility or fetal development.

https://www.bluegreenalliance.org/site/obstructing-the-right-to-know-report/
Vermont Trends 2022

<table>
<thead>
<tr>
<th>Cleaners</th>
<th>Conventional All Purp Cleaner</th>
<th>3PC All Purp Cleaner</th>
<th>Conventional Glass Clean</th>
<th>3PC Glass Cleaner</th>
<th>Conventional Bath Room Cleaner</th>
<th>3PC Bath Room Cleaner</th>
<th>Conventional Carpet Cleaner</th>
<th>3PC Carpet Cleaner</th>
<th>Conventional Floor Care</th>
<th>3PC Floor Care</th>
<th>Conventional Hand Soap</th>
<th>3PC Hand Soap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>19</td>
<td>2</td>
<td>13</td>
<td>47</td>
<td>21</td>
<td>33</td>
<td>36</td>
<td>38</td>
<td>24</td>
<td>16</td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td>Percentage</td>
<td>36.5%</td>
<td>3.8%</td>
<td>25.0%</td>
<td>90.4%</td>
<td>40.4%</td>
<td>63.5%</td>
<td>69.2%</td>
<td>73.1%</td>
<td>46.2%</td>
<td>30.8%</td>
<td>75.0%</td>
<td>73.1%</td>
</tr>
</tbody>
</table>

Disinfectants Found in VT K-12 2022

- **Quats**: 88.5%
- **Bleach**: 9.6%
- **2-Phenyl-Phenol**: 5.8%
- **3rd Party Certified**: 44.2%
The VT Envision Program provides tools and supports to improve the environmental health in K-12 schools usually at little or no cost.

ENVISION PROGRAM: PROMOTING HEALTHY SCHOOL ENVIRONMENTS

Poor indoor air quality in schools has been linked to decreased student and teacher performance and increased absenteeism. Poor indoor air quality can also result in acute symptoms such as eye, nose and throat irritation, headache, nausea, lethargy and chronic conditions—such as asthma and allergies. The Envision Program – Promoting Healthy School Environments was created by the Legislature in 2000 as part of the School Environmental Health Act (Act 125) to address indoor air quality issues by providing model environmental health management plans, policies and guidance to schools.

The School Environmental Health Act 125 was passed into law with goals to improve school indoor air quality, reduce hazardous exposures, and help schools earn the Envision Certificate of Achievement.

› Learn more about Act 125

From unblocking air vents to limiting the use of disinfecting wipes, you can take simple steps to make your school healthier. Check out the video below and learn how to inspect your school building to identify potential environmental health issues. Then scroll down to find important resources about the Envision Program and how to address indoor air quality and environmental health in your school.
SARS-CoV-2, the virus that causes COVID-19, is primarily transmitted via airborne droplets and aerosols.

The risk of getting COVID-19 from surfaces is very low, 1 in 10,000.

Follow Vermont Standards of Practice regarding cleaning and disinfecting the School Health Office between patients.
Ventilation is the most effective way to remove SARS-CoV-2 particles from the air.

- Filtration
- Air changes per hour
Portable Air Cleaners with HEPA filters can be 99% effective in removing viruses & asthma triggers. Avoid those that emit ozone.

- California Air Resources Board approved machines
- Air cleaners certified by the Association of Home Appliance Manufacturers.
- Harvard – CU Portable Air Cleaner Calculator

Look for an AHAM certification stamp on the air cleaner, check the Clean Air Delivery Rate (CADR) and the room size the unit can filter.
Breaking the Chain of Infection - Cleaning

Essential to infection control: uses water, detergent and abrasion.

- Removes most germs & conditions they need to survive (e.g. dirt, moisture).
- Helps break down the outer lipid/fat shell of viruses like SARS-CoV-2.
- Prepares the surface for disinfecting.
Breaking the Chain of Infection - Sanitizing

- **Sanitizing**
  - Cleaning
  - Removing Germs up to 99%
  - **Sanitizing**
  - Killing/Inactivating Bacteria
    - 99.9 to 99.999%
  - **Disinfecting**
  - Killing/Inactivating All Germs Tested Except Their Spores

For use on food contact surfaces:

- Counters, tables/desks used for eating, dishes, cooking utensils
- COVID-19 is caused by a **virus**, and sanitizers only work on **bacteria**.
- Some products are approved to be both a sanitizer and disinfectant at different concentrations and contact times.
Registered pesticides designed to kill organisms

- Use on hard nonporous surfaces such as door handles, tables, and other high-touch areas. Requires cleaning first and possibly rinsing surface after disinfecting!
- Choose no-rinse disinfectants with short contact times and safer ingredients.
- Always clean before disinfecting.
Ingredients in common cleaning, sanitizing & disinfecting products are linked to:

- Asthma & asthma episodes
- Brain, nervous system, reproductive organ, kidney, & liver damage
- Eye irritation & headaches
- Breathing problems & illnesses
- Hormone disruption or mimicking
- Cancer
Exposure

Children exposed to the same dose of chemical toxins as adults are harmed more severely.
Many cleaning, sanitizing, and disinfecting products can irritate lungs, and trigger or even cause new onset asthma.

Asthma is a chronic inflammatory disorder of the airways in the lungs that results in:

- Wheezing
- Coughing
- Chest tightness
- Trouble breathing
Asthmagens & Asthma Triggers

**Benzalkonium Chloride**

**Bisphenol A (BPA)**

**Chlorine Bleach**

**Ethanolamines**
- monoethanolamine
- diethanolamine
- triethanolamine

**Fragrance Ingredients:** volatile organic compounds, aerosols, etc.

**Parabens and Phthalates**

**Quaternary Ammonium Compounds (QUATS):**
- (N)-alkyl dimethyl benzyl ammonium chloride
- Benzalkonium chloride
- (octyl & dioctyl) didecyl dimethyl benzyl ammonium
- Didecyl dimethyl ammonium chloride
- Diemethyl ethel benzyl ammonium chloride
- Lauryl dimethyl benzyl ammonium chloride
• EDCs interrupt or imitate natural hormonal messages.

• Hormones and EDCs work in tiny doses, parts per billion.

• EDCs may cause:
  - Reduced fertility in women & men
  - Early puberty in girls
  - Increases in cancers of the breast, ovaries, and prostate

Minute doses of EDC’s can harm people in different ways, essentially tricking the body into responding to chemicals as hormones during key stages of development.
Anybody from the school community can nominate a school for recognition. Categories include policy, practices and products. They fall under the scope of facilities staff, administrators & school nurses.

To learn more, visit: Asthma-Friendly Schools Recognition Application
Childhood Asthma rates are high in VT

Quick links:

- **Asthma Action Plan**
- **Model: Confidential Emergency Response Plan**
- **Model: School/District Wide Respiratory Emergency Response Plan**
- **Poster: Fragrance Health Impacts**
- **Brief Asthma Self Management Education** (coming soon from VT Asthma Program)
- **Standards of Practice: School Health Services Manual**
- **VT Asthma Program Manager**
- **State School Nurse Consultant**
Disinfectants such as bleach and those containing quats should not be used when children or adolescents are present, because these are known respiratory irritants.

Only products labeled as safe for humans and the environment... containing active ingredients such as hydrogen peroxide, ethanol, citric acid, should be selected from List N, because they are less toxic, are not strong respiratory irritants or asthma triggers, and have no known carcinogenic, reproductive, or developmental effects.

Susan Kaplan, J.D., Research Assistant Professor, UIC School of Public Health

## Disinfectant Details

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>AVOID</th>
<th>USE WITH CAUTION</th>
<th>PREFERRED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disinfectant</strong></td>
<td><strong>Bleach - sodium hypochlorite</strong></td>
<td><strong>Quaternary Ammonium Compounds – Quats</strong></td>
<td><strong>Thymol</strong></td>
</tr>
<tr>
<td>Status of DFE review* (see below)</td>
<td>Failed</td>
<td>Failed</td>
<td>Failed</td>
</tr>
<tr>
<td>Contact time* General &amp; COVID-19</td>
<td>30 seconds</td>
<td>3-seconds - 10 minutes</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Skin sensitizer &amp; asthmagén</td>
<td>Mixing with bleach creates a poisonous gas</td>
<td>Contact dermatitis &amp; nasal irritation</td>
<td>Respiratory sensitiser, linked to asthma and endocline disruption</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Always read product label for specifics as concentrations and corresponding efficacies vary by microbe. For Covid-19 information, check EPA’s List N.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure controls</td>
<td>PPE &amp; increased ventilation</td>
<td>PPE &amp; increased ventilation</td>
<td>No special requirements</td>
</tr>
</tbody>
</table>

*Always read product label for contact time specifics based on concentration and targeted microbes.

**Infection Control Handbook for Schools**
Identify Safer Disinfectants

EPA’s Design for the Environment Disinfectant Program:

- Certifies that products meet their health & safety standards
- Lists only safer active ingredients:
  - Hydrogen Peroxide
  - Citric Acid
  - Chitosan
  - Ethanol
  - L-lactic acid
  - Isopropanol
  - Peroxyacetic acid
  - Sodium Bisulfate
Identify Safer Disinfectants

Look for the following:

• EPA registration number = effective
• 0 Health rating on the Hazardous Materials Identification System (HMIS)
• Signal words **CAUTION** or **WARNING** instead of **DANGER** on label
• Short contact time
• No rinse requirement
Choosing Safer Sanitizers and Disinfectants

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>HEALTH</th>
<th>FLAMMABILITY</th>
<th>PHYSICAL HAZARD</th>
<th>PERSONAL PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

4. Severe Hazard  
3. Serious Hazard  
2. Moderate Hazard  
1. Slight Hazard  
0. Minimal Hazard

HMIS

NFPA
EPA created **List N** a searchable database that provides disinfectant formulations effective against the SARS-CoV-2 virus.

List N prioritizes disinfection and many listed products are hazardous to human health. Search for products using the active ingredients certified as safer by DfE.

[www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2](http://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)
### List N: Disinfectants for Use Against SARS-CoV-2 (COVID-19)

**Date Accessed:** 03/12/2021

<table>
<thead>
<tr>
<th>EPA Registration Number</th>
<th>Active Ingredient(s)</th>
<th>Product Name</th>
<th>Company</th>
<th>Contact Time (in minutes)</th>
<th>Formulation Type</th>
<th>Surface Types</th>
<th>Use Sites</th>
<th>Why is this product on List N?</th>
<th>To kill SARS-CoV-2 (COVID-19), follow disinfection directions for the following pathogen(s)</th>
<th>Date Added to List N</th>
</tr>
</thead>
<tbody>
<tr>
<td>84368-1</td>
<td>Ethanol (Ethyl alcohol)</td>
<td>Urthpro LLC</td>
<td>0.5 (30 seconds)</td>
<td>Ready-to-use</td>
<td>Hard Nonporous (HN); Food Contact No Rinse (FCNR)</td>
<td>Healthcare; Institutional; Residential</td>
<td>Tested against SARS-CoV-2 (COVID-19); Emerging viral pathogen claim</td>
<td>SARS-CoV-2</td>
<td>03/02/2021</td>
<td></td>
</tr>
<tr>
<td>84130-3</td>
<td>Ethanol (Ethyl alcohol)</td>
<td>Salsa GOJO Industries Inc</td>
<td>1</td>
<td>Ready-to-use</td>
<td>Hard Nonporous (HN); Food Contact No Rinse (FCNR)</td>
<td>Healthcare; Institutional; Residential</td>
<td>Kills a harder-to-kill pathogen than SARS-CoV-2 (COVID-19); Emerging viral pathogen claim</td>
<td>Hepatitis A virus</td>
<td>02/11/2021</td>
<td></td>
</tr>
<tr>
<td>84130-4</td>
<td>Ethanol (Ethyl alcohol)</td>
<td>Charleston GOJO Industries Inc</td>
<td>0.5 (30 seconds)</td>
<td>Ready-to-use</td>
<td>Hard Nonporous (HN); Food Contact No Rinse (FCNR)</td>
<td>Healthcare; Institutional</td>
<td>Kills a harder-to-kill pathogen than SARS-CoV-2 (COVID-19); Emerging viral pathogen claim</td>
<td>Hepatitis A virus</td>
<td>08/13/2020</td>
<td></td>
</tr>
<tr>
<td>84150-1</td>
<td>Ethanol (Ethyl alcohol)</td>
<td>PURELL Professional Surface Disinfectant Wipes GOJO Industries Inc</td>
<td>5</td>
<td>Wipe</td>
<td>Hard Nonporous (HN); Food Contact No Rinse (FCNR)</td>
<td>Healthcare; Institutional; Residential</td>
<td>Kills a harder-to-kill pathogen than SARS-CoV-2 (COVID-19); Emerging viral pathogen claim</td>
<td>Norovirus</td>
<td>03/03/2020</td>
<td></td>
</tr>
</tbody>
</table>

Choosing Safer Sanitizers

Look for the following:

• Approval for food contact surfaces
• No rinse required
• 0 health rating on the HMIS
• Signal words CAUTION or WARNING instead of DANGER on label
• Short contact time
• Design for the Environment Logo
• Free of fragrance & dyes
Choosing Safer Cleaning Products

Look for the Following:

- Third-party certification
- Signal word WARNING instead of DANGER on label
- Non-aerosol
- Free of fragrances & dyes
- All ingredients listed on the label or website
Third-party certifiers

Look for the logos:

• Green Seal

• Safer Choice (EPA)

• UL ECOLOGO®
Electrostatic Sprayers/Mister Foggers

Sold early in the pandemic, these disinfection application devices raise concerns in the public health community about:

• Lung Exposure:
  • Droplet size
  • PPE requirement compliance/respirators
• Effectiveness – contact time
• Disinfectant overuse
EPA/CDC have concerns with mister/foggers:

- Health risks – the fine mist stays in air longer and poses an inhalation hazard.
- Efficacy – the mist may not stay wet long enough for required contact time.

Recommend against: CDC, VT & other states
Resources

Partners:

• VT School Board Insurance Trust
• AoE- School Facility Improvement Project
• VDH Division of Health Promotion and Disease Prevention: Asthma
• Envision: VDH Division of Environmental Health
Thank You for Participating

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