



Go Green!

Move to green cleaners for worker health and a safer environment

GREEN CLEANING IN YOUR WORKPLACE TRAINING WORKBOOK



UConn | **HEALTH
CENTER**

Division of Occupational and Environmental Medicine

June 2013

This training workbook is based on a research study
**Green Cleaning: Exposure Characterization
and Adoption Process Among Custodians**

funded by the Center for Disease Control and Prevention/National Institute of Occupational Safety and Health (NIOSH) (Grant number: R21 OH009831-01). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC/NIOSH.

Acknowledgments

- Connecticut Employees Union Independent (CEUI), Service Employees International Union (SEIU), Local 511
- Connecticut Counsel on Occupational Safety and Health (ConnectiCOSH)
- Connecticut School Indoor Environment Resource Team
- Cleaning for Healthy Schools Toolkit
- Informed Green Solutions
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Introduction

Go Green Cleaning Training

Let's begin

Tell everyone

- ◇ Your first name
- ◇ One thing you like about green cleaning products
- ◇ One thing you'd like to change about green cleaning products

What is Green Cleaning?

“Green cleaning is defined as cleaning to protect health without harming the environment ... Current products, processes and procedures aren't necessarily bad, but newer technologies and processes make it possible to clean effectively, efficiently, and with less impact on health and the environment. And to be clear, green cleaning is more than switching a few products; it's about *effective* cleaning to create healthier buildings and at the same time reduce environmental impacts.”

Green Cleaning Network—<http://www.greencleaningnetwork.org/gc-home.html>

Connecticut law requires state agencies to use green cleaners in state owned buildings (Public Act No. 07-100). Non-profit organizations, Green Seal or EcoLogo, certify green cleaning products.

A Green Cleaning Program in Connecticut includes:

- ◇ GreenSeal or EcoLogo certified cleaning products
 - ✱ Green cleaning products are tested to make sure they work well when directions are carefully followed.
 - ✱ Green cleaning products use less harmful chemicals than conventional cleaners so they are less likely to cause illness or harm the environment.
- ◇ Procedures — Green cleaning products work well when you follow the instructions on the label. For example, workers should add the right amount of water to cleaning concentrate and some products need to sit on the surface for a while to work the best way.
- ◇ Specialized equipment — The cleaning equipment you use is important and may include dilution stations, microfiber cloths and mops, steam units, spray and vacuum machines, floor care equipment, and walk-off mats. Many of the new tools help you to work with less stress on your muscles, joints and bones. Using green cleaners does not mean you have to scrub harder to get the job done.
- ◇ Training — Workers need to be trained on how to use green cleaning products, and what they need to know to work safely.

Green Cleaning - It's the Law

Connecticut Public Act No. 07-100 is a law that requires state agencies to use green cleaners certified by a national or international environmental certification program (Green Seal or EcoLogo). The CTDAS, Connecticut Department of Administrative Services, Buildings and General Services contracts with companies to provide green cleaning products. Disinfectants, sanitizers, and other antimicrobial/antigerm products are not part of this Connecticut law. The EPA/US Environmental Protection Agency regulates sanitizers and disinfectants (called antimicrobial pesticides). Green cleaning products are thought to be safer for humans and the environment. They are certified by non-profit organizations that use science to evaluate chemicals and determine how they may affect health and the environment. They help us identify safer cleaning products and publish lists of certified green cleaning products. Connecticut uses these organizations to identify safer cleaning products:

EcoLogo – a program of Underwriters Laboratory, based in Canada

Green Seal – a program based in the United States and used by many institutional purchasers

Look for the logos:	
	
EcoLogo	Green Seal

At the end of the training you will know...

- ◆ What a green cleaning program is
- ◆ How cleaning with green cleaning products is different from cleaning with conventional products
- ◆ How to effectively use green cleaners and disinfectants
- ◆ What the information on the cleaning product label tells you
- ◆ More about health and safety in your workplace

SMALL GROUP ACTIVITIES



Small Group Activity 1

A Green Cleaning Program

A green cleaning program works best when everyone on the cleaning team knows how to use the cleaning products and the equipment. Training on how to use cleaning products correctly is important to protect the health and safety of workers.

A Green Cleaning Program starts with smart cleaning methods:

- ◆ Having written procedures for cleaning, sanitizing and disinfecting
- ◆ Following label directions
- ◆ Adding the amount of water listed on the product label to the concentrate
- ◆ Leaving the disinfectant solution glistening wet on the surface for the amount of time listed on the product label (dwell time)
- ◆ Cleaning from the top down
- ◆ Spraying into a cloth instead of on the surface
- ◆ Using a stream rather than a mist when you are spraying a product
- ◆ Training on using personal protective equipment (PPE) like gloves and goggles
- ◆ Wearing gloves, goggles, aprons, respirators and other personal protective equipment when it is listed on the product label or MSDS/ Material Safety Data Sheet

Special equipment can help green cleaners work even better.

Microfiber - Microfiber cloths and mops are made up of fibers that are smaller than a human hair so they can get into small cracks that cotton or paper towels can't reach. They have an electrical charge that holds dirt, dust and germs in the cloth until they are washed. Microfiber mops are designed to reduce muscle and joint pain and injuries.

Microfiber cloths and mops can be used for the following cleaning tasks:

- ✱ Dusting
- ✱ Floor finishing
- ✱ Glass and stainless steel cleaning
- ✱ Removing germs
- ✱ Wet cleaning
- ✱ Wet mopping

Shine and Smell with Green Cleaning Products

Green cleaners are different from conventional cleaners. You may have noticed a difference in shine and smell when using green cleaning products.

Shine - Shiny floors seem to tell us that they have been cleaned and cared for. Floors cleaned with green products may not have a high shine but the surface is clean. After switching to a green cleaning program, clean floors may not be shiny. The ingredients in conventional cleaners that made the floors shine are not used in green cleaners. The ingredients don't help the product clean and they can be bad for the environment.

Smell - We are used to smells like bleach, pine, and lemon in cleaning products to tell us that an area has been cleaned. These smells come from chemicals that do not help cleaning. Here are some tips about smells.

- ✱ The best way to clean is to get rid of bad smells (urine, germs) without adding new chemical smells. Fragrance added to cleaners and deodorizers that plug-in to walls can contain chemicals that may irritate our breathing and may be harmful to our health. These chemicals often do nothing to clean.
- ✱ Many people link the smell of bleach with clean because bleach kills germs. But bleach can irritate breathing. There are other ways to get rid of germs without using a chemical that can hurt your breathing.

As a group, circle all items that are part of a green cleaning program. Pick one person to record and report the group's answers.

Fragrance free

Pine scent

Lemon scent

High shine

Spray and wipe

Let sit the recommended time

Microfiber mop

Cotton dust cloth





Small Group Activity 2

Germinator: Part 1

When do you clean? • When do you sanitize? • When do you disinfect?

We use cleaners, sanitizers and disinfectants for different tasks. Green cleaning programs choose the least hazardous chemical that will get the job done.

This is how the U S Centers for Disease Control and Prevention explains the difference among cleaners, sanitizers, and disinfectants:

<http://www.cdc.gov/mrsa/environment/index.html>.

- ◆ “Cleaners or detergents are products that are used to remove soil, dirt, dust, organic matter, and germs (like bacteria, viruses, and fungi). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water. The same thing happens when you wash your hands with soap and water or when you wash dishes.”
- ◆ “Sanitizers are used to reduce germs from surfaces but (do) not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that (are) considered safe.”
- ◆ “Disinfectants are chemical products that destroy or inactivate germs and prevent them from growing. Disinfectants have no effect on dirt, soil, or dust.”

A green cleaner works well for most general cleaning jobs and is less hazardous than sanitizers and disinfectants. Public health laws tell us where to use sanitizers and disinfectants, so you need to use sanitizers

and disinfectants for some tasks. For example, sanitizers are often used in food preparation areas in kitchens. Disinfectants are important to use in hospitals to reduce the spread of infection. The facilities department at your work will have a cleaning plan to tell you where you need to use sanitizers and disinfectants.

As a group read the definitions below. Pick one person to write down your group's answers and share the answers with the larger group.

Circle the correct word for each definition:

1. Reduces, but does not eliminate, surface germs to levels that are considered safe for public health. Required in some areas covered by law or regulation including child care areas, food service areas/ kitchens.

Cleaning

Sanitizing

Disinfecting

2. Destroys almost all germs on a surface that cause infections when used as the label directs. Are not a green cleaning product. Used to protect from infectious disease. Should be used where required by law, high-risk areas, or in case of infectious disease.

Cleaning

Sanitizing

Disinfecting

3. Physically removes dirt and germs using water, detergent and rubbing of the surface.

Cleaning

Sanitizing

Disinfecting



Small Group Activity 2

Germinator: Part 2

When should you use disinfectants?

Disinfectants and sanitizers are used in many cleaning programs. Disinfectants are usually the most hazardous chemicals that custodians use.

Disinfectants do not need to be used everywhere. An all-purpose green cleaner and microfiber cloth (without any disinfectants) can get rid of over 90% of germs. Disinfectants and sanitizers should be used according to your cleaning plan and where required by law.

Read the information on disinfectants and high risk or high touch. As a group, answer the following question. Identify one person to record and report back the results of your discussion.

High Risk and High Touch

High Risk: High risk areas are places where there is a strong possibility of germs that cause infections. **Disinfectants are used to reduce the spread of illness.** These areas include rest rooms, nurses' offices, some parts of athletic facilities, and hospitals. The product label on the disinfectant will say what germs the disinfectant will destroy (for example H1N1 flu virus or tuberculosis).

High Touch: High touch areas are places where many people touch the surface. **Disinfectants are also used on high touch areas.** Your cleaning plan should tell you when and how often to use a disinfectant

on a high touch surface. Doorknobs, push bars, and railings are things that people often touch.

Floors and other areas usually need to be cleaned but not disinfected (unless your cleaning plan says to disinfect to control infection).

Examples of High Risk and High Touch areas:

High Risk Areas	High Touch Areas
Places where blood or body fluids have spilled	Door knobs
Drinking fountains	Keyboards
Gym mats	Push bars
Hospital patient rooms	Light switches
Diaper changing tables	Railings
Bathroom fixtures	Floors

Here are some tips on reducing the spread of infections and using disinfectants:

- ◆ Know your cleaning plan and where disinfecting must be used.
- ◆ Disinfect spots of blood, body fluids, sewage wastes and other things that spread disease
- ◆ Reduce the use of disinfectants by:
 - ✱ Cleaning with an all-purpose cleaner before you disinfect. Disinfectants work better when you clean the area first to get rid of dirt and other hiding places for germs.
 - ✱ Using microfiber mops and cloths to clean.

- ◆ Don't move germs from one area that you have cleaned to the next. For example, if you use a microfiber mop, remove the used mop pad and put it in a bag to launder before moving to the next room or area. Put a clean mop pad on when you get to the next room or area.
- ◆ Follow the label directions. If using a concentrate, make sure you mix the chemical with the right amount of water. Disinfectants must be left wet on the surface for the right amount of time in order to kill germs. Wipe or rinse the surface if it says so on the label.
- ◆ Know how to protect yourself. Bleach is good at killing germs but can also hurt your breathing and can combine with other chemicals like ammonia or "quats" to make a dangerous gas. Bleach is not used in most green cleaning programs. Accelerated hydrogen peroxide is a safer disinfectant.
- ◆ Learn about new technologies. New ways to disinfect may become available that use less hazardous chemicals. New equipment like steam machines and water-based devices can clean, sanitize and disinfect.

Now that you have read the information on disinfectants and high risk or high touch areas, it's time to answer some questions. Pick one person in your group to write down your group's answers and share the answers with the larger group.

Questions:

1. Is a keyboard high risk or high touch?
2. When would you disinfect a doorknob?







Small Group Activity 3

411 on Product Labels: Part 1

Cleaning product labels have information on health hazards, how to use the product safely, and what PPEs to use. It is important to understand this information to protect your health and safety.

Read the labels on the cleaning products you brought to the training (or use a label from the trainer).

As a group, answer the following questions. Pick one person to write down your group's answers and share them with the larger group.

1. Do the labels give information about health hazards?
What hazards?
2. What does the label tell you about how to use the product safely?
3. What information does the label tell you about the personal protective equipment (PPE) to use?
4. Are any of the cleaning products certified by a third party?

Hint: do you see





Small Group Activity 3

411 on Product Labels: Part 2

Using Material Safety Data Sheets (MSDSs)

1. OSHA requires your employer to have a MSDS for every hazardous chemical that you work with.
2. MSDSs have information on:
 - ◇ Hazardous chemicals in the product and the common chemical names
 - ◇ Health effects
 - ◇ Exposure limits
 - ◇ Whether the chemical is considered to cause cancer
 - ◇ Precautionary measures
 - ◇ Emergency and first-aid procedures
 - ◇ The organization that prepared the MSDS
3. To use an MSDS effectively, it is important that your employer train you. It is also the law. The employer must train you on all the chemicals you work with. If you have to wear a respirator, or other personal protective equipment (PPE), you have to be trained to use the PPE the correct way.
4. Workers should review the MSDSs before using the product. Ask for help or more information from Environmental Health and Safety.

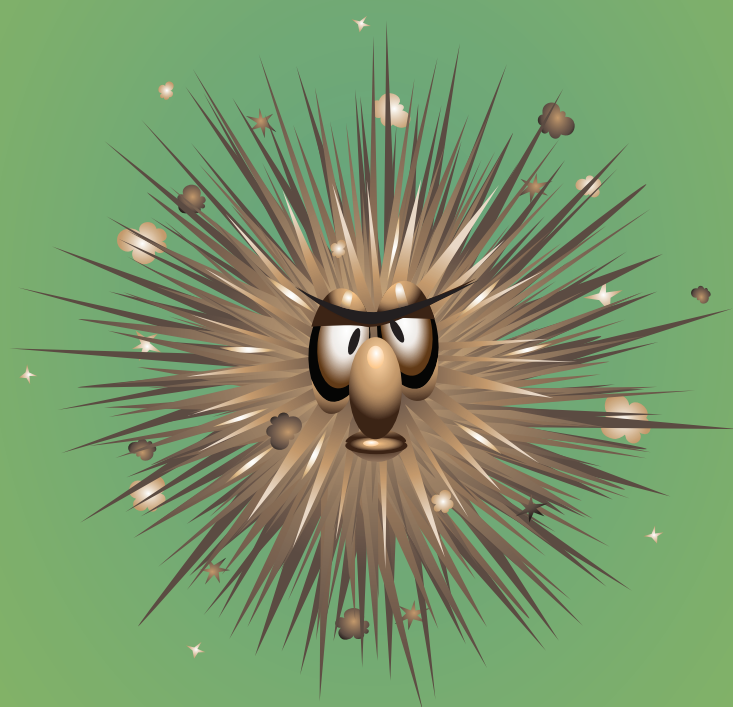
5. Part of your “right-to-know” is to have MSDS for each product that contains hazardous chemicals on file in your work area where you can get them.

Now that you have read the fact sheet about MSDS...

Where are the Material Safety Data Sheets (MSDS) located in your workplace?

References

- University of Connecticut Health Center, Division of Occupational and Environmental Medicine - Green Cleaning Project
<http://oehc.uchc.edu/greencleaning.asp>
- Air Quality Sciences, Inc. – *Green Cleaning for Health*
http://www.aerias.org/uploads/Green_Cleaning_for_Health.pdf
- CT Department of Administrative Services
http://das.ct.gov/images/1090/EPP_Cleaning_Policy_072011.pdf
- Informed Green Solutions Fact Sheets
www.informedgreensolutions.org
- OSHA/NIOSH Infosheet, Protecting Workers Who Use Cleaning Chemicals
<http://www.osha.gov/Publications/OSHA3512.pdf>
- The University of Connecticut's Green Cleaning Agenda
<http://www.ecohusky.uconn.edu/documents/GreenCleaningAgenda.pdf>



OSHA·NIOSH INFOSHEET

Protecting Workers Who Use Cleaning Chemicals

Workplaces, such as schools, hospitals, hotels, restaurants and manufacturing plants, use cleaning chemicals to ensure the cleanliness of their buildings. Workers who handle these products include building maintenance workers, janitors and housekeepers. Some cleaning chemicals can be hazardous, causing problems ranging from skin rashes and burns to coughing and asthma. Many employers are switching to green cleaning products because they are thought to be less hazardous to workers and the environment. This INFOSHEET provides information to employers on practices to help keep workers safe when working with cleaning chemicals, including green cleaning products.

Potential Health Problems Caused by Cleaning Chemicals

Many factors influence whether a cleaning chemical will cause health problems. Some important factors to consider include:

- Chemical ingredients of the cleaning product;
- How the cleaning product is being used or stored;
- Ventilation in the area where the cleaning product is used;
- Whether there are splashes and spills;
- Whether the cleaning product comes in contact with the skin; and
- Whether mists, vapors and/or gases are released.

Chemicals in some cleaning products can be irritating to the skin or can cause rashes. Cleaning products that contain corrosive chemicals can cause severe burns if splashed on the skin or in the eyes.

Mists, vapors and/or gases from cleaning chemicals can irritate the eyes, nose, throat and lungs. Symptoms may include burning eyes, sore throat, coughing, trouble breathing and wheezing. Chemicals in some cleaning products can cause asthma or trigger asthma attacks. Some cleaning products contain hazardous chemicals that can enter the body through skin contact or from breathing gases into the lungs. ***Mixing cleaning products that contain bleach and ammonia can cause severe lung damage or death.***

Choosing Safer Cleaning Chemicals: Cleaners, Sanitizers or Disinfectants

The Environmental Protection Agency (EPA) defines cleaners, sanitizers and disinfectants as follows:

Cleaners remove dirt through wiping, scrubbing or mopping.

Sanitizers contain chemicals that reduce, but do not necessarily eliminate, microorganisms such as bacteria, viruses and molds from surfaces. Public health codes may require cleaning with the use of sanitizers in certain areas, like toilets and food preparation areas.

Disinfectants contain chemicals that destroy or inactivate microorganisms that cause infections. Disinfectants are critical for infection control in hospitals and other healthcare settings.

Cleaners, sanitizers and disinfectants serve different purposes, and it is important to choose the least hazardous cleaning chemical that will accomplish the task at hand. Before purchasing cleaning products, determine whether or not sanitizing or disinfecting is necessary. If sanitizing or disinfecting is not required, then choose a cleaner. In general, disinfectants and sanitizers are more hazardous than cleaners.

If sanitizing or disinfecting is necessary, be sure that the product purchased is effective for the microorganisms being targeted. EPA regulates sanitizers and disinfectants (termed “antimicrobial pesticides”) and is a useful resource. For further information, see EPA’s webpage “What Are Antimicrobial Pesticides?” (http://www.epa.gov/oppad001/ad_info.htm).

Choosing Safer Cleaning Chemicals: Green Cleaners

Many employers and building managers are purchasing “green” cleaning chemicals with the expectation that green cleaning products are safer for workers and the environment. However, placing the word “green” in a name or on a bottle does not

ensure that a chemical is safe. Employers should review the cleaning chemicals they purchase, including green cleaning products, to understand their health and safety hazards. Employers should choose the least hazardous cleaners.

Independent organizations are now certifying chemicals, including cleaners, as “green.” *Certified green cleaners* must meet specific criteria as defined by the certifying organization. Employers may find information from these certifying organizations helpful when purchasing cleaning chemicals. Some certifying organizations are listed under the Resources section below. The EPA webpages “Cleaning” (<http://www.epa.gov/epp/pubs/products/cleaning.htm>) and “Greening Your Purchase of Cleaning Products: A Guide for Federal Purchasers” (<http://epa.gov/epp/pubs/cleaning.htm>) provide comprehensive guidance for purchasers of cleaning products.

Choosing Safer Cleaning Chemicals: Material Safety Data Sheets

When choosing safer cleaning chemicals, employers can learn much from **Material Safety Data Sheets** (MSDSs). Employers must obtain and maintain MSDSs for all hazardous cleaning products and chemicals that they use. MSDSs must be readily accessible to workers. Employers can use the information contained in the MSDSs to ensure that workers are properly protected. MSDSs include the following important information:

- Hazardous chemical ingredients;
- Symptoms and health problems that may be caused by the chemical ingredients;
- First-aid measures if workers are exposed;
- Recommended personal protective equipment, such as gloves, safety goggles or respirators; and
- Proper procedures for cleaning up spills.

Safe Work Practices When Using Cleaning Chemicals

Employers must provide safe working conditions for employees using cleaning chemicals. When cleaning chemicals are hazardous, employers must train workers on safe work practices for using these chemicals. Safe work practices when using cleaning chemicals include the following:

- Warning workers not to mix cleaning products that contain bleach and ammonia;
- Making sure that workers know which cleaning chemicals must be diluted and how to correctly dilute the cleaners they are using;

- Thoroughly reviewing and training workers on the use, storage and emergency spill procedures for cleaning chemicals;
- Reviewing the proper protective equipment needed, such as gloves and goggles, and providing the proper protective equipment to the workers using the cleaning product;
- Ensuring that all containers of cleaning products and chemicals are labeled to identify their contents and hazards;
- Operating ventilation systems as needed during cleaning tasks to allow sufficient air flow and prevent buildup of hazardous vapors; and
- Providing workers with a place to wash up after using cleaning chemicals.

Worker Training

Chemicals pose a wide range of health and safety hazards. OSHA’s Hazard Communication standard (29 CFR 1910.1200) is designed to ensure that information about these hazards and associated protective measures is communicated to workers. Worker training must be provided if the cleaning chemicals are hazardous. This training must be provided BEFORE the worker begins using the cleaner. Required training under the OSHA Hazard Communication standard includes:

- Health and physical hazards of the cleaning chemicals;
- Proper handling, use and storage of all cleaning chemicals being used, including dilution procedures when a cleaning product must be diluted before use;
- Proper procedures to follow when a spill occurs;
- Personal protective equipment required for using the cleaning product, such as gloves, safety goggles and respirators; and
- How to obtain and use hazard information, including an explanation of labels and MSDSs.

The following are important issues to be discussed with workers during training:

- Never mix different cleaning chemicals together. Dangerous gases can be released.
- Cleaning chemicals should not be used to wash hands. Wash hands with water after working with a cleaning chemical, especially before eating, drinking or smoking.

Employers must provide training to workers at a level and in a language and vocabulary that they can understand.

Better Ways to Clean

Employers should note recent advances in safe cleaning practices and the availability of modern cleaning equipment that minimizes the use of chemicals. Practices and equipment to consider include:

- Walk-off mats placed inside and outside of entryways (to prevent dirt from being tracked into the building);
- Microfiber mops, cloths and dusters;
- High-filtration HEPA vacuums;
- Walk-behind hard floor auto-scrubbers;
- Hands-free mops; and
- Chemical-free cleaning systems.

Building owners and planners should take building cleaning into consideration when designing new buildings, remodeling old buildings and choosing materials, such as flooring. See NIOSH's Prevention through Design (PtD) program (<http://www.cdc.gov/niosh/topics/PtD>) and EPA's Design for the Environment (DfE) (<http://www.epa.gov/dfe>) for more information.

Resources

The Occupational Safety and Health

Administration (OSHA) provides additional information on the webpage "OSHA Assistance for the Cleaning Industry" (<http://www.osha.gov/dcsp/products/topics/cleaningindustry/index.html>). OSHA's Safety and Health Topics webpage "Hazard Communication" (<http://www.osha.gov/dsg/hazcom/index.html>) has information on OSHA's Hazard Communication standard. OSHA's guidance document, Chemical Hazard Communication (<http://www.osha.gov/Publications/osh3084.pdf>), provides information on putting together a comprehensive chemical hazard communication program. OSHA has guidance on personal protective equipment (<http://www.osha.gov/Publications/osh3151.html>), including the types of gloves recommended for exposures to different chemicals.

The National Institute for Occupational Safety and Health (NIOSH) leads a national initiative called Prevention through Design (PtD) (<http://www.cdc.gov/niosh/topics/PtD>) that addresses workplace safety and health during the design and planning of workplaces, materials and equipment in order to prevent or minimize hazards and risks.

The Environmental Protection Agency (EPA) has standards for safer cleaning products under the EPA's Design for the Environment (DfE) Safer Product Labeling Program (<http://www.epa.gov/dfe>). A DfE label on a cleaner indicates that the cleaner meets the EPA's safety standards.

- The DfE Safer Product Labeling Program's list of certified products (<http://www.epa.gov/dfe/pubs/projects/formulat/formpart.htm>)

Other EPA resources:

- Cleaning (<http://www.epa.gov/epp/pubs/products/cleaning.htm>)
- Greening Your Purchase of Cleaning Products: A Guide for Federal Purchasers (<http://www.epa.gov/epp/pubs/cleaning.htm>)
- What Are Antimicrobial Pesticides? (http://www.epa.gov/oppad001/ad_info.htm)

Independent organizations that certify green cleaners:

- Green Seal (www.greenseal.org)
- Ecologo (www.ecologo.org)

Other helpful resources:

- See the New Jersey Department of Health and Senior Services' Controlling Chemical Exposure Industrial Hygiene Fact Sheets (<http://www.nj.gov/health/surv/documents/ihfs.pdf>) for more information on worker safety when working with chemicals.
- The Department of Health and Human Services provides an online Household Products Database (<http://hpd.nlm.nih.gov/index.htm>) containing health and safety information on many household products, including cleaners.
- The Janitorial Products Pollution Prevention Project (<http://wsppn.org/studies/janitorial/fact-sheets>) has fact sheets on specific cleaning tasks, such as carpet cleaning, metal cleaning and toilet cleaning and has a cleaning fact sheet in Spanish.
- Informed Green Solutions (<http://www.informedgreensolutions.org>) has a number of fact sheets and publications on safe cleaning practices.
- A 2002 report entitled "Cleaning for Health: Products and Practices for a Safer Indoor Environment" (<http://www.informinc.org/cleanforhealth.php>) published by INFORM also provides good information.

OSHA Educational Materials

OSHA has an extensive publications program. For a listing of free items, visit OSHA's web site at www.osha.gov/publications or contact the OSHA Publications Office, U.S. Department of Labor, 200 Constitution Avenue, N.W., N-3101, Washington, DC 20210. Telephone (202) 693-1888 or fax to (202) 693-2498.

Contacting OSHA

To report an emergency, file a complaint or seek OSHA advice, assistance or products, call (800) 321-OSHA (6742) or contact your nearest OSHA regional, area, or State Plan office; TTY: 1-877-889-5627.

Contacting NIOSH

To receive documents or more information about occupational safety and health topics, please contact NIOSH: 1-800-CDC-INFO (1-800-232-4636); TTY: 1-888-232-6348; e-mail: cdcinfo@cdc.gov or visit the NIOSH web site at www.cdc.gov/niosh.

This guidance document is not an OSHA standard or regulation but contains recommendations that are advisory in nature and intended to assist employers in providing a safe and healthful workplace. The mention of any non-governmental organization or link to its web site in this guidance does not constitute an endorsement by NIOSH or OSHA of that organization, its products or services or web site.

For more information:





A Green Cleaning Program for Connecticut Facilities

Legislation

Connecticut law requires state agencies to use green cleaners certified by the Green Seal or EcoLogo. Disinfectants, sanitizers, and other antimicrobial products are not currently regulated under this law.

Purchasing

Connecticut's Department of Administrative Services (DAS) has general information and a training video on their website about the "Environmentally Preferable Purchasing (EPP) Program." Connecticut DAS currently has contracts with vendors to provide EPP "Green Seal" or "EcoLogo" certified cleaning products, and disinfectants, disinfecting cleaners, sanitizers and antimicrobial products sanitizers. To access the contract for janitorial and custodial supplies and find lists of suppliers and specific cleaners, disinfectants and sanitizers, please visit the DAS website.²

A Green Cleaning Program

A comprehensive green cleaning program includes:

1. Environmentally preferable (third-party certified) cleaning products
2. Best practices
3. Advanced technology equipment
4. Implementation plan
5. Worker health and safety

1. Environmentally Preferable Cleaning Products

Third-Party Certification

Non-profit organizations that evaluate products using science-based criteria for health and environmental impacts are called third-party certifiers. They identify safer cleaning products and publish lists of these products.

The two certification agencies stipulated under Connecticut requirements are:



Look for the logos:

EcoLogo – a program of Underwriters Laboratory, based in Canada



Green Seal – a program based in the United States and used by many institutional purchasers



Third-Party Certified Cleaning Products

Third-party certified products are available in a growing list of categories including the following:

- | | |
|----------------------------------|----------------------------------|
| ✓ all-purpose cleaner | ✓ drain cleaner |
| ✓ floor finish and stripper | ✓ glass & window cleaner |
| ✓ hand soaps and hand sanitizers | ✓ heavy-duty cleaner |
| ✓ neutral floor cleaner | ✓ stainless steel cleaner |
| ✓ toilet bowl cleaner | ✓ whiteboard cleaner and markers |

Sanitizers/Disinfectants

Sanitizers and disinfectants are some of the more hazardous products used as part of a cleaning program. While environmentally preferable sanitizers and disinfectants are not currently regulated under Connecticut law, the following types of environmentally preferable sanitizers and disinfectants are available: ³

- **Acid-based sanitizers/disinfectants** – use an acid as the active ingredient. Generally these products do not require rinsing.
- **Hydrogen peroxide-based sanitizers/disinfectants** – combine an acid, such as acetic acid, with hydrogen peroxide to create a higher level of effectiveness.
- **Dry steam vapor technology** - for sanitizing and cleaning surfaces has been shown to be effective and is used by animal labs, major food chains, hospitals and the military.⁴ Heat has long been considered an effective way to kill microbes.

2. Best Practices

A green cleaning program is most successful when best practices are implemented so that everyone on the cleaning team knows what procedures to use and is trained in the proper use of chemicals and equipment. This ensures that there is consistency in the methods used to clean and that the health of workers is protected. Best practices may include the following:

- Written procedures for cleaning, sanitizing and disinfecting
- Training on cleaning products and equipment use

- Instruction and certification on blood-borne pathogens procedures
- Training and preparation on personal protective equipment (PPE)
- Education on chemical right-to-know programs

An important Best Practice involves gaining an understanding of the differences between cleaning, sanitizing and disinfecting. The Centers for Disease Control and Prevention (CDC) defines these activities as follows:

- “**Cleaners** or detergents are products that are used to remove soil, dirt, dust, organic matter, and germs (like bacteria, viruses, and fungi). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water. The same thing happens when you wash your hands with soap and water or when you wash dishes.”
- “**Sanitizers** are used to reduce germs from surfaces but (do) not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that (are) considered safe.”
- “**Disinfectants** are chemical products that destroy or inactivate germs and prevent them from growing. Disinfectants have no effect on dirt, soil, or dust.”

3. Advanced Technology Equipment

In addition to green cleaning products, there are ways to work more safely and improve cleaning by using some useful equipment and approaches.

Microfiber Cloths and Mops

Microfibers are polyester and nylon (polyamide) materials that are many times smaller in diameter than human hair and are used to make cleaning cloths and mop heads. Microfibers come in different grades. The preferred product is the ultra-fine microfiber with a denier measurement of 0.13. A denier is a measurement used to describe the fineness of a fiber.

- Microfiber mops and cloths can be used for the following cleaning tasks:

✓ Dusting	✓ Floor finishing
✓ Glass and stainless steel cleaning	✓ Removing biofilm
✓ Wet cleaning	✓ Wet mopping
- The small-size allows for penetration of surface contours, such as cracks that conventional cloths or paper towels are not able to reach. The increased surface area and star shape fibers enable the cloths to absorb up to 7 to 8 times their weight in liquid. Absorption is mechanically increased by the scrubbing. These features also enable the microfiber to pick up grease and oil better than conventional cloths and mops.⁵
- Microfiber is superior at capturing microbes and breaking up biofilms that form where water may collect around sinks. The University of California, Davis Medical Center compared the amount of bacteria picked up by a cotton-loop mop and by a microfiber mop. The cotton-loop mop reduced bacteria on the floors by 30%, whereas the microfiber mop reduced bacteria by 99%.¹
- Cross-contamination in facilities can be reduced by using microfiber mops and cloths. 

Changing mop pads after each room reduces the opportunity for spreading microbes from one room to another. Microfiber cloths and mops are available in different colors so that a color-coding system can be implemented for specific uses.

- Microfiber mop systems are ergonomically designed for ease of use and to reduce injury. A University of Massachusetts Lowell study reported the risk of worker injury was reduced by two factors: 1) reduced weight, and 2) elimination of wringing.
- Microfiber cloths and mops can be washed and reused. A laundering system for microfiber should include:
 - o *Washing:* Microfiber should be washed only with other microfiber materials because it can extract material, such as lint, from cotton or other fabrics during the washing and drying process. A mild laundry detergent is recommended. Bleach, fabric softener, or dryer sheets degrade the fabric and should never be used.
 - o *Drying:* Microfiber can be line dried safely. If an automatic dryer is used, the setting should always be at **LOW**. The manufacturer's cleaning and maintenance instructions should be followed.

4. Implementation Plan

Involving staff members in transitioning to the new products and procedures will help ensure they understand and fully adopt the green cleaning program. Additionally, building occupants need to be aware of the transition and what changes they may expect. For example, smells and shine may be different with green cleaning. With the reduction of scented products, occupants may not recognize that an area has been cleaned. Floors may not be as shiny because the heavy metals that made the floors shine have been removed.

The following steps can assist in making the transition to a green cleaning program more successful:

- Involve the Environmental Health and Safety Committee in the process, such as reviewing new cleaning products and procedures. Initiate a pilot project and have staff members evaluate the cleaning products for their ease of use and efficacy. Their evaluation should be shared with all the staff members who will be using the products.
- Schedule trainings with the distributor on how to use the new cleaning products and equipment. Training should allow time for questions, demonstrations and hands-on application. It is helpful to have a translator for workers with English as a Second Language when possible.
- Monitor success through the acceptance of the new products by custodians and building occupants.
- Inform the public about the changes that have taken place through a newsletter, emails, or posters.

5. Worker Health and Safety

Training and safe work practices are important in green cleaning programs. Custodians may experience inhalation or skin exposures.

Custodial Job Hazards

Exposures can happen when a custodian breathes in fumes, or when materials spill or splash on skin or into eyes, nose and mouth. Biological exposures can happen during cleaning or waste removal when the custodian encounters unexpected sharp objects that may contain biological materials.

Biological and chemical exposure examples:

- o Biohazard wastes and dusts; blood and needles, kitchen and animal wastes
- o Chemical cleaning products including “green” products, disinfectants and sanitizers

Custodial work may include physical hazards as well.

Physical hazard examples:

- o Lifting, bending, stooping, climbing
- o Electric shock
- o Trips and falls- uneven, wet and/or slippery floors, ladders
- o Abrasions and cuts- waste materials and glass

Hazard control

After hazards are identified, they can be prevented or controlled. Listed in order of preference for protecting workers, hazard control in a green cleaning program may include the following:

- o Substitution, elimination or replacing a conventional cleaning product with a less hazardous cleaning product, replacing conventional tools with ergonomically designed equipment
- o Engineering - Physically removing contaminants from a worker; increasing ventilation/ airflow
- o Administrative - Implementing trainings which may include: safe work practices; proper use of materials and products; blood borne pathogen first aid, ergonomics, fire emergency response, hazard identification and communication, personal protective equipment use
- o Personal Protective Equipment (PPE) - the last line of defense includes skin (gloves and protective clothing), respiratory (respirator and/or dust mask) or eye (goggle) protection



- ¹ DAS Procurement - Environmentally Preferred Purchasing: <http://das.ct.gov/cr1.aspx?page=132>
- ² DAS contract for janitorial and custodial supplies: http://www.biznet.ct.gov/SCP_Documents/Results/6556/009_0049.pdf (Green cleaning products) http://www.biznet.ct.gov/SCP_Documents/Results/9462/010_0263.pdf (Disinfectants, disinfecting cleaners, sanitizers and antimicrobial products sanitizers)
- ³ US Food and Drug Administration. Code of Federal Regulations Title 21. Sec. 178.1010 Sanitizing Solutions. Available at: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=178.1010>
- ⁴ Sexton, J., MS, Tanner, B., PhD, Maxwell, S., BS, Gerba, C., PhD. *Reduction of microbial load on high touch surfaces in hospital rooms by treatment with a portable saturated steam vapor disinfection system*. 2011. Available at: <http://digitalreprints.elsevier.com/issue/40750>.
- ⁵ Microfiber.com, Fabric of the Future, "What is microfiber?" Available at: <http://www.microfiber.com/microfiber.html>.
- ⁶ Environmental Protection Agency, *Using Microfiber Mops in Hospitals*, Environmental Best Practices for Health Care Facilities November 2002. Region 9 Pollution Prevention Program. Available at: <http://www.epa.gov/region9/waste/p2/projects/hospital/mops.pdf>.

Special thanks to Informed Green Solutions for information used in this factsheet.



This fact sheet was created by the UConn Health Center ***Green Cleaning: Exposure Characterization and Adoption Process Among Custodians*** project team (supported by a grant R21 OH009831-01 from the US Center for Disease Control and Prevention, National Institute of Occupational Safety and Health (NIOSH)). The fact sheet is part of a training program for custodians designed to increase acceptance and support proper use of green cleaning products and disinfectants. Connecticut state agencies are mandated to use green cleaning products in state owned buildings—*Public Act 07-100- Concerning the Use of Cleaning Products in State Buildings*. The contents of this fact sheet are solely the responsibility of the project team and do not necessarily represent the views of NIOSH.

<http://oehc.uchc.edu/greencleaning.asp>



Equipment for Green Cleaning

In addition to green cleaning products, there are ways to work more safely and improve cleaning. Here are some useful equipment and approaches that may be helpful to your work.



Microfiber mops and cloths are helpful cleaning tools. Microfiber picks up and holds onto dirt and dust better than traditional cotton cloths and mops. With more dirt and dust staying on the microfiber, less gets into the air where people might breathe it in. Less dirt and dust resettles back on the floor and surfaces, keeping the areas cleaner.

Microfiber also picks up and holds more germs than traditional cleaning cloths. Cleaning each room with a new microfiber cloth and mop pad reduces the spread of dirt and germs from one room to the next. Custodians should use a clean microfiber cloth or mop pad for each area or room, unlike the older practice of reusing the same cotton cloth or string mop that were soaked in dirty water.

Microfiber mop heads are light weight and easy to carry. Some microfiber mops come with small tanks that hold water or green cleaning solutions. Cleaning with microfiber mops may reduce some of the custodian's physical strains because the custodian does not need to lift heavy buckets, or twist wet mops, as much as when using cloth or string mops.



The use of **walk-off mats** at the entrances of buildings significantly reduces the dirt that gets tracked in. The material and the size of the mat need to be carefully selected. With building maintenance to keep the mats in good shape and in place, custodians may use less cleaning products to clean in the building.

Advanced cleaning equipment can be very helpful. For example, some machines are designed to clean restrooms and other areas with drains. The machine automatically goes through multiple cleaning steps: the machine sprays the room with green cleaner, rinses with plain water, and then vacuums the water up. There are many types of **steam cleaning systems** that reduce germs. Custodians need specific training on how to use these tools safely and effectively.

Special thanks to Informed Green Solutions for information used in this factsheet.



Where is the Shine and Smell with Green Cleaning Products?

Green cleaners are different from conventional cleaners. You may have noticed a difference in shine and smell when using green cleaning products.

Shine

Most of us like our floors to shine. The shine seems to tell us that the floors have been cleaned and cared for. After switching to a green cleaning program, the floor finishes may not be as shiny but the surface is clean. The ingredients in conventional cleaners that made the floor shine are not in green cleaners. The ingredients don't help the product clean and they can be bad for the environment. We—custodians, supervisors, and building users—need to learn that a clean floor doesn't have to be shiny.

Smell

We are used to smells like bleach, pine or lemon in cleaning products to tell us that an area has been recently cleaned. These smells come from chemicals that do not help cleaning. Here are some tips about smells:

- The best approach to cleaning is to get rid of bad smells (urine, bacteria) without adding new chemical smells. Fragrances added to cleaners or in sprays and plug-in deodorizers can contain chemicals that may irritate our breathing and are harmful to our health. These chemicals often do nothing to clean.
- Many people link the smell of bleach with clean because bleach kills germs. But bleach can irritate breathing. There are other ways to get rid of germs without using a chemical that can hurt your breathing.

Informing Building Users

- Work with the Communications Department and the Environmental, Health and Safety Department at your institution to come up with ways to discuss with building occupants what to expect with green cleaners.
- Explain about the green cleaning program to building users:
 - o Green cleaning is better for your health and the environment
 - o Green cleaning products clean well but don't have fragrances added
 - o Floors may not be as shiny when using green cleaning products but they are clean.
- Ask for ideas on how best to work together to make *your* green cleaning program better.

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Disinfectant Use in Green Cleaning Programs

Disinfectants and sanitizers are used in most cleaning programs. Disinfectants are usually the most hazardous chemicals that custodians use. They are not cleaners and are not covered by the Connecticut (CT) law that requires CT facilities to use green cleaners. So even though you are using them, they are not “green certified”. Disinfectants and sanitizers should be used only according to your cleaning plan, in high risk areas, or where required by law.

This is how the U S Centers for Disease Control and Prevention explain the difference among cleaners, sanitizers, and disinfectants:¹

- “Cleaners or detergents are products that are used to remove soil, dirt, dust, organic matter, and germs (like bacteria, viruses, and fungi). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water. The same thing happens when you wash your hands with soap and water or when you wash dishes.”
- “Sanitizers are used to reduce germs from surfaces but (do) not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that (are) considered safe.”
- “Disinfectants are chemical products that destroy or inactivate germs and prevent them from growing. Disinfectants have no effect on dirt, soil, or dust.”

Here are some tips on disinfectants.

- ▶ **Use in high risk areas.** Certain areas such as rest rooms, nurses’ offices, some parts of athletic facilities, and hospitals need disinfecting. The label will say what germs the disinfectant are designed to be used for (H1N1 flu virus, tuberculosis bacteria, etc.).
- ▶ Frequent cleaning of high touch areas (door knobs, push bars, railings etc.) **using an all-purpose green cleaner and microfiber cloth** (without any disinfectants) can get rid of over 90% of the germs. Floors and other areas usually need to be cleaned but not disinfected (unless an infection control plan says to disinfect).
- ▶ **Know where disinfecting is required.** Disinfecting or sanitizing is needed for some areas in child care centers, hospitals, food service facilities and for cleaning up blood spills.
- ▶ Reduce the use of disinfectants by:
 - **Cleaning with an all-purpose cleaner before you disinfect.** Disinfectants work better when you get rid of dirt and other hiding places for germs.
 - **Using microfiber mops and cloths to clean.**
- ▶ **Don’t move germs from one area that you have cleaned to the next.** For example, if you use a microfiber mop, remove the used mop pad and put it in a bag to launder *before* moving to the next room or area. Put a clean mop pad on when you get to the next room or area.

¹<http://www.cdc.gov/mrsa/environment/index.html>



- ▶ **Follow the label directions.** If using a concentrate, make sure the chemical is mixed with the right amount of water. Disinfectants must be left wet on the surface for the right amount of time in order to kill germs. Wipe or rinse the surface if it says so on the label. The label may have the “dwell time or contact time.” The dwell time is the amount of time needed for a disinfectant to remain glistening wet on a surface in order to kill 99.999% of microbes on a hard surface.
- ▶ **Know how to protect yourself.** Bleach is good at killing germs but can also hurt your breathing and can combine with other chemicals like ammonia or “quats” to make a dangerous gas. Bleach is not used in most green cleaning programs. Accelerated hydrogen peroxide is a safer disinfectant.
- ▶ **Learn about new technologies.** New ways to disinfect may become available that use less hazardous chemicals. New equipment like steam machines and water-based devices can clean, sanitize and disinfect.

Special thanks to Informed Green Solutions for information used in this factsheet.

Term	Definition
Antimicrobial	A general term used to describe substances (including medicines) that kill or slow the growth of microbes.
Bacteria	Microorganisms including germs are tiny one-cell organisms found on skin, in digestive tracts, in the air, and in the soil. Most are harmless but some are harmful and can make you sick.
Bleach (or Chlorine Bleach)	A chemical commonly sold as a 5 - 8% solution of sodium hypochlorite. Sodium hypochlorite is considered an asthma-causing substance by the Association of Occupational and Environmental Clinics (AOEC). Never mix chlorine bleach with ammonia, quaternary ammonium compounds or hydrochloric acid.
Cleaning	Removing germs, dirt, and impurities from surfaces or objects. Cleaning works by using soap (or detergent), water and friction to physically remove dirt and germs from surfaces. Cleaning does not kill germs, but takes germs away with the dirt. Cleaning before using a disinfectant may reduce the risk of spreading infection more than disinfecting alone.
Concentrate	A cleaning product that has not been diluted with water. These products must be diluted before use through a dilution station or by adding the recommended amount to a smaller container that is then filled with water.
Conventional Cleaning Product	A cleaning product that may not have been tested for environmental or health effects.
Denier	A unit of measurement for fibers. The denier is based on a natural standard: a single strand of silk is one denier. Microfiber is a fine fiber of less than one denier, usually made of synthetic materials.
Detergent (or cleaners)	Detergents or cleaners are products that are used to remove soil, dirt, dust, organic matter, and germs (like bacteria or viruses). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water.
Dilute	To add water to concentrated chemical products (cleaners). Proper dilution is required for cleaners to work effectively.
Disinfect	Destroys almost all germs on a surface that cause infections when used as the label directs. Used to protect from infectious disease. Should be used where required by law, high-risk areas, or in case of infectious disease.
Disinfectant	Disinfectants are chemical products that destroy or inactivate germs and prevent them from growing. The labels on disinfectant containers list the microorganisms the product kills (HIV, MRSA, etc.).
Dwell or Contact Time	The time needed for a disinfectant to remain glistening wet on a surface in order to kill 99.999% of microbes on a hard surface.

Green Cleaning Terms and Definitions

Term	Definition
 EcoLogo (or Environmental Choice)	An independent nonprofit organization that sets environmental and health standards for products, including institutional cleaning products, and certifies that the products meet those standards. In Connecticut, EcoLogo is a third-party certifier. http://www.ecologo.org/en/
Green Cleaning	Green cleaning is a way of cleaning that protects health without harming the environment.
 Green Seal	An independent nonprofit organization that sets environmental and health standards for products, including institutional cleaning products, and certifies the products meet those standards. In Connecticut, Green Seal is considered a third-party certifier. http://www.greenseal.org/
Health Hazard	The term “health hazard” includes (but is not limited to) chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Health hazards may cause measurable changes in the body - such as decreased lung function. These changes generally show up as signs and symptoms in exposed employees - such as shortness of breath.
High Risk Area	High risk areas are places where there is a strong likelihood that infections can spread. Public health laws and programs identify some high risk areas where disinfectants are always needed. These areas include parts of rest rooms, nurses’ offices, some parts of athletic facilities, and hospitals. The product label on the disinfectant will say what germs the disinfectant will destroy (for example H1N1 flu virus or tuberculosis).
High Touch Area	High touch areas are places where many people touch the surface. Disinfectants are used on high touch areas to reduce the spread of infection. Public health laws and cleaning plans determine when and how often to use a disinfectant on a high touch surface. Doorknobs, push bars, and railings are things that people often touch.
Material Safety Data Sheets (MSDS)	The MSDS is a detailed information bulletin prepared by the manufacturer or importer of a chemical that describes the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first-aid procedures, and control measures.
Microbes	Organisms so small they can only be seen by a microscope including bacteria (e.g., <i>Staphylococcus aureus</i>), viruses (e.g., influenza A and B, which cause the flu), fungi (e.g., <i>Candida albicans</i> , which causes some yeast infections), and some parasites, commonly known as germs..

Term	Definition
Microfiber	Microfiber cloths are usually made from synthetic materials (nylon, polyester etc.). The fibers are smaller than a human hair, so they can get into cracks that cotton or paper towels can't reach. They have an electrical charge that holds dirt, dust and germs in the cloth until they are washed, but are so soft that they won't scratch or damage surfaces unless they are dirty. Well-made microfiber cloths can hold an enormous amount of water. Microfiber is also known for its durability and doesn't shed lint like other cleaning cloths.
Microorganisms	Bacteria, yeasts, simple fungi, algae, protozoans, and a number of other organisms that are microscopic in size. Most are beneficial, but some produce disease. Others are involved in composting and sewage treatment.
OSHA	Occupational Safety and Health Administration is a government agency in the U.S. Department of Labor that helps employers to maintain a safe and healthy work environment.
NIOSH	The National Institute for Occupational Safety and Health is the federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and injury. NIOSH is part of the Centers for Disease Control and Prevention (CDC).
Personal Protective Equipment (PPE)	Personal protective equipment, also called "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators, and full body suits.
Pesticide	A substance intended to repel, kill, or control any species designated a "pest," including weeds, insects, rodents, fungi, bacteria, or other organisms.
Sanitize	To reduce, but not eliminate, surface germs to levels that are considered safe for public health. Required in some areas covered by law or regulation including child care areas, food service areas/kitchens.
Sanitizer	A product used to reduce germs from surfaces but (do) not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that (are) considered safe, as determined by public health codes or regulations (usually 99.99%). Sanitizers include food-contact and non-food-contact products.
Third-party Certification	A product receives third-party certification when an independent organization uses scientific tests to verify a product meets a set of standards. For green cleaning, product labels with EcoLogo or Green Seal symbols show that the product passes health, safety and environmental tests.
Viruses	Germs that are smaller than bacteria and cannot grow or reproduce apart from a living cell. They invade living cells and use the cell's chemical machinery to stay alive and to replicate themselves. Thus, to survive and reproduce, they must invade a host cell (animal, human, plant, or bacteria). Virus infections may be spread by way of the air, by contact with surfaces, and by the exchange of body fluids.

