

# ALLERGY-PROOFING YOUR HOUSE

## CONTROLLING MOLDS IN THE HOME

Because of their opportunistic nature, molds (also known as fungi) are often a source of environmental inhalants in the home. Fungi are generally dependent on other organic substances for nutrients and energy. These molds generally grow in refrigerators, shower stalls, basements, houseplant mulch, and filters used with evaporative coolers and humidifiers.

Although most fungi grow best in warm humid environments, there is no region of the earth's surface where they do not exist. They are found from the arctic to the tropic zones, in both salt and fresh water, and in desert soils. Depending on the type of mold, spores may be dispersed by rainfall, humidity or wind. Spores are most commonly found in homes near lowland areas and lakes, and older homes with damp basements. The attic is another prominent place for mold growth.

Molds can cause year-round clinical signs with flare-ups during the winter months or during humid seasons. The following are some of the most common molds.

*Alternaria*: Windows, doorways, basements, evaporative coolers and humidifiers

*Aspergillus*: Houseplants and houseplant mulch, kitchen mold

*Dreschleria*: Outdoor fungus of grasses and cereal grains

*Stemphyllium*: Vegetable crops, decaying plant material, damp paper, canvas, cotton fabric

*Cladosporium*: Bathrooms, shower stalls, condensate on tile, behind baseboards, wood paneling and floors

*Penicillium*: Soil, fruits, breads, cheeses

*Fusarium*: Stored fruits and vegetables, field crops

There are several steps you can take to control the growth of molds in your home.

- Spray wherever possible with fungicidal products to help eliminate spores.

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- Change filters on cooling systems, furnaces, and humidifiers frequently. Use dehumidifiers to reduce the population of mold spores.
- Avoid houseplants, as the mulch tends to encourage mold growth. If you cannot remove houseplants, try spreading fish tank charcoal over the soil.
- Be sure to add algae killer to your fish tank. Scrub the decorations with chlorine bleach and rinse well before returning them to the tank.
- Use synthetic fibers in pet bedding. Wash the pet bedding frequently in hot water.
- If the pet sleeps on the bed, frequently wash bedding in hot water.

#### ALLERGY-PROOFING YOUR HOME

Even the cleanest homes are often reservoirs for common allergens such as dust mites, mold, pet dander, and residue from mice or cockroaches. The home modifications listed here—some easy, some more complicated and time-consuming—can decrease your exposure to such allergens and may help reduce allergy and asthma symptoms. Because you spend a third of your life in the bedroom, that's where you should start.

#### Bedroom

1. *Bed and bedding.* Encase pillows, mattresses and box springs in dust-mite-proof covers. Wash sheets, pillowcases and blankets at least once a week in water heated to at least 130°F.
2. *Flooring.* If possible, use hardwood or linoleum flooring instead of carpeting. Otherwise, use low-pile instead of high-pile carpeting and vacuum weekly with a vacuum cleaner that has a high-efficiency particulate air (HEPA) filter.
3. *Curtains and blinds.* Use washable curtains made of plain cotton or synthetic fabric. Replace horizontal blinds with washable roller-type shades.
4. *Furnishings.* Choose simply designed, easy to clean chairs, dressers and nightstands made of leather, wood, metal or plastic.
5. *Clutter.* Remove knickknacks, tabletop ornaments, books and magazines. Store children's toys, games and stuffed animals in plastic bins.
6. *Pets.* Keep pets out of the bedroom. Bathing pets at least twice a week may reduce the amount of allergen they shed.
7. *Air filtration.* Choose an air filter that has a HEPA filter.

#### Living Room

1. *Flooring.* If possible, use hardwood or linoleum flooring instead of carpeting. Otherwise, use low-pile instead of high-pile carpeting and

- vacuum weekly with a vacuum cleaner that has a high-efficiency particulate air (HEPA) filter. Wash area rugs and floor mats weekly.
2. *Furniture.* Consider replacing upholstered sofas and chairs with furniture made of leather, wood, metal or plastic.
  3. *Curtains and blinds.* Use washable curtains made of plain cotton or synthetic fabric. Replace horizontal blinds with washable roller-type shades.
  4. *Windows.* Close windows and rely on air conditioning during pollen season. Clean mold and condensation from window frames and sills.
  5. *Plants.* Find a new home for potted plants or spread aquarium gravel over the dirt to help contain mold.
  6. *Pets.* Consider keeping your pet outside.

### Kitchen

1. *Stove.* Install and use an exhaust fan to remove cooking fumes and reduce moisture. Most stove-top hoods simply filter cooking particulates without venting outside.
2. *Sink.* Wash dishes daily. Scrub the sink and faucets to remove mold and food debris.
3. *Refrigerator.* Wipe up excessive moisture to avoid mold growth. Discard moldy or out-of-date food. Regularly empty and clean dripping pan and clean or replace moldy rubber seals around doors.
4. *Cabinets and counters.* Clean cabinets and countertops with detergent and water. Check under-sink cabinets for plumbing leaks. Store food—including pet food—in sealed containers.
5. *Food waste.* Place garbage in a can with an insect-proof lid and empty trash daily.

### Bathroom

1. *Ventilation.* Install and use an exhaust fan to reduce moisture while taking baths or showers.
2. *Floors.* If possible, use wood or linoleum flooring.
3. *Walls.* Remove wallpaper and install tile, or paint walls with mold-resistant enamel paint.
4. *Tub.* Towel-dry the tub and enclosure after use. Scrub mold from tub and faucets. Clean or replace moldy shower curtains and bathmats.

### Basement

1. *Flooring.* Remove moldy or water damaged carpeting. If possible, use cement or linoleum flooring; otherwise, use low-pile instead of high-pile carpeting and vacuum weekly with a vacuum cleaner that has a small particle or HEPA filter. Install plastic sheeting (vapor barrier) under carpeting to prevent moisture seepage.
2. *Furniture.* Consider replacing upholstered sofas and chairs with furniture made of leather, wood, metal or plastic.
3. *Foundation, windows and stairwells.* Check for and repair any sources of leaks or water damage.

4. *Air quality.* Use a dehumidifier to reduce dampness, and clean it once a week.
5. *Storage.* Store collectibles and clothes in plastic storage bins.
6. *Clothes dryer.* Use an exhaust fan to vent moisture outside.

#### Entire House

1. *Temperature and humidity.* Hot, humid houses are breeding grounds for dust mites and mold. Maintain temperature at 70°F and relative humidity at 30-50%. Clean or replace small particle filters in central heating and cooling systems and in-room air conditioners at least once a month.
2. *Infestations.* Control cockroaches and mice with inexpensive traps from the hardware store. If that's not effective, hire a professional exterminator. To remove allergy-triggering insect and mouse residue, thoroughly vacuum carpeting and wet-wash hard surfaces. To prevent reinfestation, seal cracks or other entryways.
3. *Mold.* Close doors and windows during warm weather and use air conditioning and dehumidifiers. Remove nonwashable contaminated materials such as carpeting. Clean washable material with a solution of 5% chlorine bleach and wear a protective mask when cleaning away mold.
4. *Weekly cleaning routine.* Damp-mop wood or linoleum flooring and vacuum carpeting. Use a vacuum cleaner with a small particle or a HEPA filter. Use a damp cloth to clean other surfaces, including the tops of doors, windowsills, and window frames. If you're allergic, either wear a dust mask or get a nonallergic person to do this job.
5. *Smoking.* Don't allow smoking anywhere inside your house.

#### CONTROLLING MOLD GROWTH IN YOUR HOME

Molds are fungi, usually microscopic in size, that occur in nature in large quantities. They reproduce by releasing spores into the air that settle on surfaces and, under the right conditions, grow. Growths of mold can often be seen in the form of a discoloration, ranging from white to orange and green to brown and black. Mold can sometimes be detected by its musty odor. Mildew is a common mold.

When mold spores settle on organic or contaminated surfaces and when other conditions of temperature, humidity, shade or darkness, and oxygen supply are conducive, they germinate and develop new colonies of mold. Even surfaces from which mold has previously been removed can have mold growing again if the conditions are right.

#### What are the conditions that support mold growth?

1. *Molds thrive on organic materials* like natural fibers (such as cotton and wool), paper, leather, wood, or surfaces coated with the slightest amount of organic matter such as food, grease, and soil. Molds that continue to grow can eventually eat away the organic medium that is their source of

food. Wooden structural materials and textiles can deteriorate when mold is allowed to thrive on them.

2. *Molds grow best in warm temperatures, 77°-86°F*, though some growth may occur anywhere between 32°-95°F.
3. *Molds require moisture.* Moisture can come from water leaks, flooding, capillary movement (wicking from one area to another), high relative humidity, and condensation. The moisture may be in the host material, on its surface, or in the form of humidity in the air.

Relative humidity levels above 70% appear to be optimal for fungal or mold spore growth. A lower relative humidity level reduces the rate of mold growth as the mold goes dormant but does not stop growth and development entirely. In fact, at low relative humidity levels, there is increased spore release into the air.

Materials that are exposed to a constant leak or have been soaked and not dried thoroughly can support mold growth. Some molds can take hold and form a new colony in one or two days on damp material. When the relative humidity is low, the temperature is too high or too low, or the organic material is gone, molds go dormant. But when the relative humidity gets high, they can regenerate.

4. *Molds require oxygen, but not light, for growth.* Mold growth can continue indefinitely without light.

#### What are the health effects of exposure to mold?

We are all exposed to many kinds of mold both inside and outside the house. However, some people seem to be more sensitive to mold and have allergies to some types of mold. These people may suffer from cold-like symptoms.

When people are experiencing these symptoms, it is difficult to know if they are the result of exposure to molds or have other causes. When breathed, some mold spores are small enough to go deeply into the lungs and cause serious illness. It is not healthy to live in a home with high levels of mold.

#### How do I know if there is mold in my house?

Many times, mold can be detected by a musty odor. Although mold spores are too small to be seen, colonies of mold growth are sometimes visible on damp walls and musty-smelling textiles. Mildew is one type of mold that can often be seen.

In most cases, it is not practical to test for mold growth in a house. There are no standards for "acceptable" levels of mold in a dwelling, and when testing is done, it is usually to compare levels of mold spores inside the house with levels outside the house. It is generally better to look for mold in those places where conditions promote mold growth.

#### Where would mold be most likely to grow?

Generally, mold may be found anywhere where moisture or relative humidity levels are high. Wet or damp basements may have mold growing on the walls, floor, carpeting, or on materials stored in the basement.

Moisture from the earth can migrate through concrete walls causing them to remain damp. Water standing in sump holes, condensate from an air conditioner or dehumidifier, leaky pipes, or water seeping into the basement are all sources of moisture that can support mold growth.

Basement carpeting often has mold growing on or under it if the carpeting is installed on a concrete floor that remains cool and damp. Materials stored in a damp basement may have mold growing on them. In particular, firewood stored in the basement puts moisture into the air and is an excellent medium for mold growth. The mold spores can then spread throughout the house.

Crawlspaces built over uncovered earth can have mold problems when the moisture in the ground causes dampness in the space. Crawlspaces that are sloped incorrectly and have water pooling in them are particularly likely to have problems.

Mold can often be found growing in the bathroom. If an exhaust fan is not used during bathing, large amounts of moisture can remain in the shower or tub area. Soap scum on bath and shower walls, even on ceramic tile or fiberglass, is a nutrient source for mold growth.

In the laundry room, unvented clothes drying produces high levels of relative humidity that support mold growth. Damp towels and clothes in laundry hampers, washers, or dryers can develop mildew growth.

Using a humidifier sometimes raises the relative humidity high enough that mold will grow. Particularly in the winter, high relative humidity in areas where there is little air movement results in condensation on cold walls and subsequent mold growth. Dark patches of mold can sometimes be seen inside the upper corner of a closet on an outside wall or behind furniture placed against outside walls. Window condensation can result in mold growth where the moisture runs onto the sill or wood trim.

Mold growth can be found on kitchen walls if household cooking involves large amounts of boiling water and no exhaust fan is used. The cooking spatters and grease film on walls are the source of nutrients for the mold, combined with the high humidity levels in those areas. Floor-level pans that collect the condensate from automatic defrosting refrigerators often have mold growing in them.

New construction materials, such as new wooden wall studs and floor joists, drywall compound, and masonry materials emit moisture into the home while the construction components dry.

Unvented combustion heaters, such as kerosene heaters, emit large amounts of humidity into the air with the exhaust gases.

Spills or leaks, such as a sink or toilet overflow onto carpet and other flooring materials, can cause those materials to become moldy.

Flooded and fire-damaged houses that have had water soaked into carpeting and other materials often have mold growth starting in those materials within a day or so after being soaked. Some materials can wick the moisture beyond the original wet spot. Plaster, drywall, insulation, and flooring materials are all likely to wick the moisture into the wall cavities and to larger areas on walls and floors.

## How can mold growth be controlled?

### *Keep It Clean!*

1. Keep surfaces and household textiles clean because mold grows on materials contaminated with soil and grease. Use a grease-cutting solution of detergent and water to wash hard surfaces like walls and floors to remove organic material that supports mold growth.  
Trisodium phosphate is an effective cleaner for removing grease. Commonly called TSP and highly alkaline, it can sometimes be found in paint and hardware stores for washing walls in preparation for painting. Precautions should be taken when using strong cleaners such as TSP; wear rubber gloves, and avoid breathing the powder or getting it in the eyes.  
Rinse with clear water to remove any cleaner residue. Dry quickly and thoroughly using fans and a dehumidifier, if possible.
2. Store textiles dry and clean. Dry soiled textiles can be kept for a few days before washing. Store clean textiles in a closet or container that discourages the growth of mildew.
3. Filtration of indoor air with an air cleaner can sometimes be effective in removing mold spores before they settle on damp surfaces and colonize. Some mold spores are large enough that standard furnace filters remove them. Some types of electrostatic air cleaners also remove mold spores.

### *Keep It Dry!*

1. Reduce the moisture produced inside the home. Discontinue using a humidifier if relative humidity levels are high (over 50%). Use exhaust fans vented to the outside when taking baths or showers or when cooking.  
Wipe down shower walls with a squeegee or sponge after bathing. Vent clothes dryers to the outside. Do not use unvented kerosene or gas heaters. Repair all plumbing leaks. Do not store firewood inside the home.
2. Dehumidify humid areas. A dehumidifier, air conditioner, or furnace will help to dry the air. Increasing ventilation by opening windows or installing vents may help if relative humidity level is lower outside the house than inside. It is particularly important to dehumidify or ventilate the house when new construction materials have been added.
3. Increase the air flow in problem areas. Move furniture a few inches away from outside walls so that air flow will decrease the problem of condensation on the walls.  
If mold is growing in closets, keep closet doors open to promote air flow. Closets should not be over-filled, as this will reduce air circulation in the closet. Louvered closet doors aid in ventilation. Circulating fans may help with air flow in problem areas.
4. Keep textiles dry. Always dry textiles that are damp or wet before storing, and do not store laundry in damp places. When cleaning textiles, follow the recommendations given on the care label. Quickly and thoroughly dry the products.  
Although plastic bags may be desirable to protect textiles for short periods of time, they should not be used for long-term storage because condensation may occur in the bag. Cloth bags or fabric, such as sheets,

draped over stored textiles allow ventilation, provide protection from light and soil, and prevent condensation in storage.

Desiccants such as silica gel can be used in clothes storage areas to reduce moisture. Desiccants are more effective in small confined storage compartments such as drawers and boxes. Adequate ventilation, such as in closets with louvered doors or doors that are opened frequently, discourages mold growth as does leaving on a light in the closet.

5. Prevent condensation problems by installing adequate insulation to keep walls warm. Installing storm or thermal pane windows raises the temperature of the glass during winter months resulting in less condensation on windows.
6. Reduce sources of moisture coming from the outside. Seal cracks in the basement walls and foundation. Slope the earth away from the house to promote drainage away from the foundation walls. Use downspouts to direct rainwater away from the house. Cover window wells.
7. Install vapor barriers in crawlspaces to prevent ground moisture from entering. Crawlspaces that continue to have high humidity need ventilation.

### Strategies for Preventing or Removing Mold Growth after Contamination

#### *Clean It and Dry It*

After a flood, fire, or water leak, walls and floors that were soaked for more than a few hours may have absorbed large amounts of water. These areas must be cleaned, dried, and disinfected. If necessary, remove the wall board and flooring materials to dry out these areas.

Mold has been found growing in wet insulation several months after a flood. Remove and discard wet insulation. The insulation and the wooden studs may be wet for two or more feet above the flood's high-water level because of absorption by the materials and wicking to other areas.

Organic matter from flood water must be cleaned up. Using a solution of detergent, water and trisodium phosphate, scrub all contaminated areas with a brush and rinse thoroughly. Scrub any exposed wood in the wall cavities with a detergent before disinfecting and drying.

Use fans, dehumidifiers, and air conditioners to dry a wet area. If using a dehumidifier, empty the water collection pan frequently or drain it through a hose to a floor drain. Mold can grow in the water standing in the collection pan. Air conditioners remove moisture from the air and help promote drying. Several weeks or months may pass before soaked walls and floors are dry enough to re-insulate and re-install wall board or flooring.

#### *Discard Wet Materials That Cannot Be Dried Quickly*

Carpets and carpet padding, draperies, mattresses, box springs, and upholstered furniture that have been soaked or stored in a damp environment are nearly impossible to clean and dry quickly enough to prevent mold growth. Mold thrives under wet carpet or padding and inside mattresses and upholstery. If these products have only a small amount of mold growth on the surface, they may be dried in the sun. Sunlight kills mold but it may also fade textiles; therefore, sun drying may be a method of last resort in attempting to save items that are about to be discarded.



### *Disinfect It*

Disinfectants kill mold growing on hard surfaces, such as walls and hard floors. Products that claim to be disinfectants must be registered with the Environmental Protection Agency and have an EPA registration number on the product label. Only products with the EPA registration number have been tested as disinfectants. Read labels and choose a product that disinfects and is appropriate for the material being treated.

One of the most effective and least expensive disinfectants is chlorine (sodium hypochlorite) bleach. Check the label and use only bleach with 5.25% sodium hypochlorite. Following the directions on the label, a bleach solution can be applied to hard, clean surfaces. The walls should be thoroughly cleaned with a detergent solution before disinfecting.

For many hard surfaces, disinfecting with a solution of one cup of bleach to one gallon of water is effective. The area must be kept wet with the bleach for 10-15 minutes to kill the mold. If the surface is porous like wood, the bleach solution may need to be reapplied to keep the surface wet for the required time. If large areas of a basement need to be disinfected, a garden sprayer can be used to apply the bleach solution to the walls. If the walls have been contaminated with sewage, increase the proportion of bleach to water.

During a long drying period (such as after flooding), it may be necessary to use the disinfectant every few days until the wood is no longer damp. The bleach solution kills mold only for the few minutes before the bleach evaporates. Because mold spores in the air that settle on the wet wood can germinate and develop a new colony of mold, a surface will not remain mold-free just because it has been treated once with bleach. Covering wet wood with wall board or flooring material will not stop the mold growth, as mold does not need light to grow.

After a flood, test whether wooden studs in the walls are dry enough to reseal the wall cavity by inserting a moisture probe into the wood. If the level of moisture in the wood is above 12.5%, continue drying the wood before resealing the wall cavities.

**Never mix bleach with ammonia** or other household cleansers containing ammonia. When cleaning with chlorine bleach solution, wear rubber gloves and protect skin. Avoid contact of the solution with the eyes and skin and avoid prolonged breathing of vapors.

Some products will disinfect hard surfaces but are ineffective for disinfecting textiles. To be sure that textiles that can be laundered are disinfected, use products with the EPA registration number and with specific directions for disinfecting laundry. Two types of disinfectants that are effective on fabrics are chlorine bleaches (5.25% sodium hypochlorite) and quaternary compounds. When caring for textiles, directions provided on the care label should be carefully followed. Some textiles are harmed by chlorine bleach and labels on those products indicate that chlorine bleach should not be used. Liquid chlorine bleaches are safe for most fibers except wool, silk, or resin-coated fabrics, but often cause color fading (as do quaternary compounds). Test any disinfecting compound on an inconspicuous portion of the textiles before applying to the entire product.

Pine oil cleaners and phenolic cleaners are considered safe for textiles and are often recommended for their disinfecting action. However, many formulations of these compounds only reduce the mold and number of bacteria and do not totally disinfect textiles. For example, a pine oil cleaner should be at least 70% pine oil to disinfect textiles. Most formulations sold are much lower concentrations.

For some textiles, such as leather, none of the disinfectants discussed above are appropriate. In the table that follows, additional details of methods for preventing, killing, and removing mold are suggested for both textiles and interior and exterior surfaces.

**Remember, to prevent mold, keep it clean and keep it dry.** To remove mold after contamination, clean it, dry it and disinfect it. Unless these methods are used, molds may continue to plague homes.

Item	To Prevent Mold Growth	To Remove Mold
Painted surfaces inside the home	Keep surfaces dry and warm to prevent condensation. Clean surfaces to remove dirt and grease. Provide adequate ventilation. Check the label of paint being purchased to see if a mildewcide is one of the additives. Local paint stores carry mildewcides to add to paint if extra protection is needed. With wallpaper, use sizing and a wallpaper paste that is mildew resistant. wallpaper paste that is mildew resistant.	Scrub mildewed surfaces with a of one cup of chlorine bleach to one gallon of water. A detergent such as trisodium phosphate (TSP) or liquid dishwashing detergent may be added to the solution. Do not mix bleach with cleaners that contain ammonia. Rinse with clean water and allow to dry thoroughly Before painting or wallpapering.
Bathrooms	Keep bathrooms as clean and dry as possible. Wipe down shower walls with a towel, sponge, or squeegee after showering. Use a vented exhaust fan to pull moist air out of the bath during and after showering or bathing. Be sure the fan is vented to the outside, not into the attic or crawlspace.	Scrub surfaces with a solution of one cup of liquid chlorine bleach, one tablespoon of detergent that does not contain ammonia, and one gallon of water. Use a brush or old toothbrush to clean the grout. Keep the surface wet for about ten minutes, then rinse well with water. If the shower curtains can be washed by machine, add chlorine bleach with the detergent. Use a warm water rinse for plastic curtains and hang while warm to allow wrinkles to fall out.
Painted exterior surfaces	Get rid of damp soil or heavy vegetation near walls. Rearrange plantings for good air circulation around the house foundation. Commercial fungicide products will inhibit mildew growth but may be toxic for humans and pets. Follow instructions carefully.	Scrub mildewed paint with a solution of 1/3 c. detergent that does not contain ammonia, 1 qt. chlorine bleach, and 3 qt. of water. Repaint with a mildew-resistant paint.
Roofs—asphalt shingles and fiberglass panels	Shaded areas are more likely to be affected by mold than are sunny areas. Provide adequate ventilation by removing vegetation growing close to the roof. Clean the debris from the roof using a garden hose and a stiff broom. To prevent mildew growth, spray clean the roof annually with a mixture of one part liquid chlorine bleach and nine parts water at the rate of one gallon per 30 square feet. Chlorine bleach can damage some roofing materials, so test before using. Shingles containing small zinc granules are available. Zinc granules are a fungicide as they dissolve. They are slightly more expensive than other shingles. Commercial fungicidal products will inhibit mildew growth but may be toxic for humans or pets. Follow instructions carefully.	To clean a mildewed roof, use a mixture of three parts liquid chlorine bleach and one part water at the rate of one gallon per 30-50 sq. ft. Discolored roofs should be treated in strips, starting at the peak and working toward the eaves. Any shrubs or plants below the eaves should be draped with plastic to prevent contact with dripping solution. Dilute the solution that drips on the ground by spraying it with water. If the house has rain gutters along the eaves, a garden hose laid in the gutters can be used to dilute the solution as it runs through the eaves and downspouts. The same treatment is also effective on fiberglass roof panels like those used on

Item	To Prevent Mold Growth	To Remove Mold
		<p>greenhouses. Chlorine bleach can damage some roofing materials, so test before using. Treated roofs are slippery when wet, so workers should walk on a ladder or other support placed on the roof. Avoid skin contact with chlorine bleach solution.</p>
<p>Wood shingles, decks, and other untreated wood</p>	<p>Sealants are available for clean, dry wood. They penetrate the wood surface and moisture from penetrating the wood, inhibiting mold growth. Shaded areas are more likely to be affected by mold than are the sunny areas. Provide adequate ventilation by removing vegetation growing close to the roof or deck. Keep the roofs free from debris that retains moisture by washing with a garden hose and a stiff broom.</p>	<p>Scrub surfaces with a solution of 1 qt. chlorine bleach, 3 oz. TSP, and 1 oz. of detergent in 3 qt. water. Rinse thoroughly. Rinse plants that have been splashed with the solution. If stains remain, increase the concentration of bleach to water and re-treat. For stubborn areas, use granular chlorine (calcium hypochlorite)—used for algae control in swimming pools—mixed at the rate of 2 oz. per gallon of water. Apply with brushes or sprayers. Do not let bleaching solutions remain on the wood for more than an hour before rinsing. Repeat the application several times if needed. Use these solutions out of direct sunlight.</p>
<p>Clothing/ other textiles</p>	<p>Keep fabrics dry. Dry textiles quickly and thoroughly. Dry soiled, damp laundry before placing it in a laundry hamper. Remove wet laundry from the washer immediately and thoroughly dry it in a dryer or air dry. Clean all textiles before storing. Soil promotes mildew growth. Store in dry environments that are well-ventilated and lighted. Do not store in plastic bags for long periods. Textiles finished with soil and moisture repellents and bacteriostats are more resistant to soil, stain, and microorganisms and, thus, more resistant to mildew growth than untreated fabrics.</p>	<p>Work quickly when mildew is discovered. Brush, shake, sun, and air mildewed textiles outdoors. Microorganisms and stains that remain can be successfully removed with chlorine bleach. Check the care label to determine if chlorine bleach can be safely used. Pretest an inconspicuous area of the fabric for color change before using the bleach. Launder washable items with soap or detergent and chlorine bleach when appropriate. Send non-washable items to the dry cleaner and inform the dry cleaner of the mildew stain. To remove stains on washable textiles that cannot be bleached with chlorine, use peroxygen bleaches containing sodium perborate or potassium monopersulfate. Apply at the hottest temperature safe for the fabric and leave in place for up to 12 hours. Apply all detergents and bleaches according to the product</p>

Item	To Prevent Mold Growth	To Remove Mold
Clothing/textiles (cont.)		instructions. Some mildew stains cannot be removed and advance mold growth may have rotted or weakened the material. These products cannot be salvaged and should be discarded.
Leathers	<p>Aerosol sprays for leathers are formulated to prevent mildew growth. Pretest the product on an inconspicuous area to determine that the color of the leather will not change. Always apply according to package instructions.</p> <p>A wax dressing will also help prevent mildew growth. Some wax dressings also contain anti-mildew ingredients. Again, pretest the item for color change before using.</p> <p>Dry all leather products thoroughly before storing. Leathers should be dried away from direct heat and where air is circulating. Always store in a dry, well-ventilated place. Never allow mildewed leather to remain in storage with other leathers.</p>	<p>Dyes used on leathers are very sensitive to numerous substances. Always test any compound to be used on leather for colorfastness.</p> <p>Moisten a cloth with diluted alcohol (one cup of denatured alcohol to one cup of water). Wipe away visible mildew. Dry in circulating air.</p> <p>Leathers that have no protective finishes are harmed easily by any cleaning compound. Cautiously apply thick suds of mild soaps or detergents to remove the remaining mildew. Wipe with a damp cloth and dry in an airy, sunny place.</p>
Books or paper	<p>Store books and papers in conditions that allow air circulation and provide light. Chemical dehumidifiers, such as silica gel, will keep small storage spaces dry. Burn a light bulb in an enclosed bookcase to discourage mildew growth.</p> <p>Spraying books or papers with a fungicide according to product directions or wiping with a cloth wetted with a solution of 3/8 ounce (11 g) salicylanilide in one quart (0.95 l) rubbing alcohol will provide some protection.</p>	<p>Dry the item because mold and mildew on paper products is easier to remove when dried. (Don't try to remove fuzzy or slimy mold). Remove the items from hot, humid or stagnant air and darkness, if possible. (Do not place in an oven). Lower the temperature and humidity and dry the items immediately, or freeze them to buy time. (Never freeze photos or negatives). If the mold remains after freezing, expose to one or two hours of sunlight to dry out.</p> <p>Observe the following procedures as you dry the item: handle soggy paper gently. Place wet items on paper towels or unprinted newspaper paper. Use fans to circulate air around (but not directly at) the documents. Spread loose material in single layers. Use waxed paper between every page of</p>

Item	To Prevent Mold Growth	To Remove Mold
Books or paper (cont.)		<p>bound books. Place paper towels inside the covers and then intermittently throughout the book. Open the books and stand them on edge. Replace the inserted paper towels as they become soaked and invert the book. Some distortion and staining is probable.</p> <p>Air-dry most photos, negatives and slides face up, placing blotting material beneath the photographs. Avoid touching the surfaces. Photos that are stuck together may separate and may need to be reprinted. If the items are not stuck, dry them intact with the glass side down.</p> <p>After the item is dry, remove the dry and powdery mold by brushing it outdoors. Remove stains that remain by wiping gently with a cloth that has been soaked with suds and wrung out. Then rinse the stain. For stubborn stains, use a chlorine bleach and water solution. (Test in an inconspicuous area to determine if a bleach solution can be safely used). Try not to wet the paper and do not scrub. Air-dry the item.</p>
Carpet and rugs	<p>If carpet is to be installed in spaces where mildew growing conditions are present, choose carpets made of all man-made fibers (both face and back). Concrete subfloor should be sealed. In areas prone to flooding or moisture, install carpet using a direct glue-down technique (without pad) to maximize drying and cleaning and to prevent mildew growth. Use a dehumidifier to reduce moisture.</p> <p>In the case of a wet carpet, the following circumstances will determine the appropriate action to prevent mildew growth: what caused the carpet to get wet, the amount and source of the water, the type and size of the carpet or rug, the location, the kind of flooring, the method of installation, and</p>	<p>If a musty mildew odor is detected, stop its growth immediately. Discard pads containing mildew. It is nearly impossible to clean and destroy all the mildew in a pad. (Compared to carpet, padding is a relatively low-cost item). It is best to hire a professional rug cleaner or restorer to clean wall-to-wall carpet.</p> <p>If you try to save the carpet yourself, you will have best results with carpet that can be removed from the floor. Apply rug shampoo with a carpet shampooer according to the manufacturer's directions. Remove all detergent used in cleaning. Detergent left in the carpet will accelerate soiling.</p>

Item	To Prevent Mold Growth	To Remove Mold
Carpet and rugs (cont.)	<p>the cleaning equipment and service available. Some carpet (i.e. carpet contaminated by sewage-laden flood water) cannot be cleaned and should be discarded.</p> <p>The longer the carpet remains wet, the greater the chances of damage, including shrinkage, color change and soil staining. Once the textile starts drying, the longer it remains damp, the more likely mildew will develop. It is important to rapidly clean and dry the carpet.</p> <p>For best results, call a professional rug and carpet cleaner who is equipped to clean and dry wet rugs and carpets. Homeowner's and renter's insurance may cover the cost.</p> <p>If you decide to clean and dry the carpet yourself, take the rug and pad outside to flat, clean area, such as a concrete driveway. Place the rug face down to prevent wicking of stain to the face yarns. Clean by hosting and applying a carpet cleaning solution. If the carpet cannot be removed, extract as much of the water as possible with a vacuum or hot water extraction unit. Care should be taken to prevent electrical shock when using a vacuum on wet carpet. If a carpet has a pad, it may be impossible to extract the water and the pad will need to be removed for drying.</p> <p>Dry the floor, pad and carpet before reinstalling. Smaller amounts of water in the pad can be removed by blowing air between the carpet and pad. To do this, lift a corner of the carpet or attach a vacuum hose to the exhaust of the vacuum and put it in the slit in a seam. A dehumidifier in a closed room will pull water out quickly.</p>	<p>Expose mildew growing on the back of the carpet to the direct rays of the sun. Paint the carpet backing with a weak chlorine solution of ¼ teaspoon of chlorine bleach to one cup of water or another sanitizing product applied according to the label directions.</p> <p>After shampooing and sanitizing, dry rugs or carpets quickly. Hang rugs on an outdoor clothesline or lay them out flat in a warm, dry place. Use electric fans to speed drying. Dry carpets and rugs thoroughly.</p>
Upholstered furniture and mattresses	<p>Upholstered furniture and mattresses are thick and porous and often filled with cellulosic and foam materials that absorb moisture. <b>Do not use these products in areas that are damp, dark or have poor ventilation.</b></p> <p>Upholstered furniture and mattresses finished with soil- and moisture-repellents and bacteriostats resist</p>	

Item	To Prevent Mold Growth	To Remove Mildew
Upholstered furniture and mattresses (cont.)	soil, stain and microorganisms and are more resistant to mildew growth.	<p data-bbox="998 252 1356 682">Take upholstered pieces and mattresses outdoors and brush the surface mold away with a broom. Vacuum using an upholstery attachment on the surface to draw out more mold. Discard the disposable vacuum cleaner bag immediately or empty the non-disposable bag outdoors to prevent the spread of mold spores. Place the mildewed item in the sun for a few hours and air it thoroughly to stop further mold growth.</p> <p data-bbox="998 714 1380 1081">If the mildew remains, use the services of a professional upholstery cleaner. If you are doing the cleaning yourself, sponge the item with thick, dry soap or detergent suds and wipe with a clean, damp cloth. Avoid getting the stuffing wet. Wipe the furniture with a cloth moistened with a solution of one cup of denatured or rubbing alcohol to once cup of water and dry thoroughly.</p> <p data-bbox="998 1113 1372 1291">If the mold is growing deep in the padding of an upholstered piece or mattress, nothing will eliminate the mold or odor except renovation by a trained upholsterer or <b>replacement of the item.</b></p>