**Ten Things You Should Know about Mold**

**www.epa.gov/mold**

Molds are part of the natural environment, and can be found everywhere, indoors and outdoors. Mold is not usually a problem, unless it begins growing indoors. **The best way to control mold growth is to control moisture**. This website provides guidance about mold and moisture for homes, schools, multifamily and commercial buildings. Molds can have a big impact on [indoor air quality](https://www.epa.gov/indoor-air-quality-iaq).

1. Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma and other respiratory complaints.
2. There is no practical way to eliminate all mold and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.
3. If mold is a problem in your home or school, you must clean up the mold and eliminate sources of moisture.
4. Fix the source of the water problem or leak to prevent mold growth.
5. Reduce indoor humidity (to 30-60%) to decrease mold growth by:
   * Venting bathrooms, dryers and other moisture-generating sources to the outside
   * Using air conditioners and de-humidifiers
   * Increasing ventilation
   * Using exhaust fans whenever cooking, dishwashing and cleaning
6. Clean and dry any damp or wet building materials and furnishings within 24-48 hours to prevent mold growth.
7. Clean mold off hard surfaces with water and detergent, and dry completely. Absorbent materials such as ceiling tiles, that are moldy, may need to be replaced.
8. Prevent condensation: Reduce the potential for condensation on cold surfaces (i.e., windows, piping, exterior walls, roof, or floors) by adding insulation.
9. In areas where there is a perpetual moisture problem, do not install carpeting (i.e., by drinking fountains, by classroom sinks, or on concrete floors with leaks or frequent condensation).
10. Molds can be found almost anywhere; they can grow on virtually any substance, providing moisture is present. There are molds that can grow on wood, paper, carpet, and foods.

**Mold and Health**

Molds are usually not a problem indoors, unless mold spores land on a wet or damp spot and begin growing. Molds have the potential to cause health problems. Molds produce allergens (substances that can cause allergic reactions) and irritants. Inhaling or touching mold or mold spores may cause allergic reactions in sensitive individuals. Allergic responses include hay fever-type symptoms, such as sneezing, runny nose, red eyes, and skin rash.

Allergic reactions to mold are common. They can be immediate or delayed. Molds can also cause asthma attacks in people with asthma who are allergic to mold. In addition, mold exposure can irritate the eyes, skin, nose, throat, and lungs of both mold-allergic and non-allergic people. Symptoms other than the allergic and irritant types are not commonly reported as a result of inhaling mold. Research on mold and health effects is ongoing.

The above does not describe all potential health effects related to mold exposure. For more detailed information consult a health professional, your state or local health department, or the [Centers for Disease Control and Prevention mold website](http://www.cdc.gov/mold/).

**Basic Mold Cleanup**

* The key to mold control is moisture control.
* It is important to dry water damaged areas and items within 24-48 hours to prevent mold growth.
* If mold is a problem in your home, clean up the mold and get rid of the excess water or moisture.
* Fix leaky plumbing or other sources of water.
* Wash mold off hard surfaces with detergent and water, and dry completely. Absorbent materials (such as ceiling tiles & carpet) that become moldy may have to be replaced.

## Asthma and Mold

The following links are to non-federal government sites [Exit](https://www.epa.gov/home/exit-epa)

Molds can trigger asthma episodes in sensitive individuals with asthma. People with asthma should avoid contact with or exposure to molds. Read more about asthma triggers on EPA's [Asthma Website](https://www.epa.gov/asthma)

### Additional Asthma Resources:

* [Allergy & Asthma Network/Mothers of Asthmatics (AAN/MA)](http://www.allergyasthmanetwork.org/)
  + (800) 878-4403
* [American Academy of Allergy, Asthma & Immunology (AAAAI)](http://www.aaaai.org/home)
  + For information [Contact AAAAI](http://www.aaaai.org/global/contact-us)
* [American Lung Association](http://www.lung.org/)
  + (800) LUNG-USA (586-4872)
  + See also their [Healthy Air Site](http://www.lung.org/healthy-air/)
* [Asthma & Allergy Foundation of America](http://www.aafa.org/)
  + (800) 7ASTHMA (727-8462)
* Canada Mortgage & Housing Corporation ["Fighting Mold - The Homeowner's Guide"](http://www.building-insights.com/ModuleFile/Fighting+Mold+-+The+Homeowners+Guide+(CMHC).pdf?id=10)
* U.S. Dept. of Health and Human Services, National Institute of Health, [National Institute of Allergy and Infectious Diseases](https://www.niaid.nih.gov/)
  + (866) 284-4107/(301) 496-5717
* [National Jewish Medical and Research Center](https://www.nationaljewish.org/)
  + (800) 222-LUNG (5864)

## Mold Cleanup

If you already have a mold problem - **ACT QUICKLY**. Mold damages what it grows on. The longer it grows, the more damage it can cause.

Who should do the cleanup depends on a number of factors. One consideration is the size of the mold problem. If the moldy area is less than about 10 square feet (less than roughly a 3 ft. by 3 ft. patch), in most cases, you can handle the job yourself, follow the [Mold Cleanup Tips and Techniques](https://www.epa.gov/mold/mold-cleanup-your-home#TipsandTechniques). However:

* If there has been a lot of water damage, and/or mold growth covers more than 10 square feet, consult EPA guide [Mold Remediation in Schools and Commercial Buildings](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide). Although focused on schools and commercial buildings, this document is applicable to other building types.
* If you choose to hire a contractor (or other professional service provider) to do the cleanup, make sure the contractor has experience cleaning up mold. Check references and ask the contractor to follow the recommendations in EPA guide [Mold Remediation in Schools and Commercial Buildings](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide), the guidelines of the American Conference of Governmental Industrial Hygenists (ACGIH), or other guidelines from professional or government organizations.
* If you suspect that the heating/ventilation/air conditioning (HVAC) system may be contaminated with mold (it is part of an identified moisture problem, for instance, or there is mold near the intake to the system), consult EPA guide [Should You Have the Air Ducts in Your Home Cleaned?](https://www.epa.gov/indoor-air-quality-iaq/publications-about-indoor-air-quality#should-you-have) before taking further action. Do not run the HVAC system if you know or suspect that it is contaminated with mold - it could spread mold throughout the building.
* If the water and/or mold damage was caused by sewage or other contaminated water, then call in a professional who has experience cleaning and fixing buildings damaged by contaminated water.
* If you have health concerns, consult a health professional before starting cleanup.\*

## Tips and Techniques

The tips and techniques presented in this section will help you clean up your mold problem. Professional cleaners or remediators may use methods not covered in this publication. Please note that mold may cause staining and cosmetic damage. It may not be possible to clean an item so that its original appearance is restored.

* **Fix plumbing leaks and other water problems as soon as possible. Dry all items completely.**
* **Scrub mold off hard surfaces with detergent and water, and dry completely.**
* Absorbent or porous materials, such as ceiling tiles and carpet, may have to be thrown away if they become moldy. Mold can grow on or fill in the empty spaces and crevices of porous materials, so the mold may be difficult or impossible to remove completely.
* Avoid exposing yourself or others to mold. See discussions:
  + [What to Wear When Cleaning Moldy Areas](https://www.epa.gov/mold/brief-guide-mold-moisture-and-your-home#tab-4)
  + [Hidden Mold](https://www.epa.gov/mold/brief-guide-mold-moisture-and-your-home#tab-7)
* Do not paint or caulk moldy surfaces. Clean up the mold and dry the surfaces before painting. Paint applied over moldy surfaces is likely to peel.
* If you are unsure about how to clean an item, or if the item is expensive or of sentimental value, you may wish to consult a specialist. Specialists in furniture repair, restoration, painting, art restoration and conservation, carpet and rug cleaning, water damage, and fire or water restoration are commonly listed in phone books. Be sure to ask for and check references. Look for specialists who are affiliated with professional organizations.\*

## Bathroom Tip

Places that are often or always damp can be hard to maintain completely free of mold. If there's some mold in the shower or elsewhere in the bathroom that seems to reappear, **increasing ventilation** (running a fan or opening a window) and **cleaning more frequently** will usually prevent mold from recurring, or at least keep the mold to a minimum.

## Floods and Flooding

During a flood cleanup, the indoor air quality in your home or office may appear to be the least of your problems. However, failure to remove contaminated materials and to reduce moisture and humidity can present serious long-term health risks. Standing water and wet materials are a breeding ground for microorganisms, such as viruses, bacteria, and mold. They can cause disease, trigger allergic reactions, and continue to damage materials long after the flood.

To learn more about flood clean up and indoor air quality, visit: [Flood Cleanup and Effects on Indoor Air Quality](https://www.epa.gov/indoor-air-quality-iaq/flood-cleanup-protect-indoor-air-quality).

# Mold Testing or Sampling

Is sampling for mold needed? **In most cases, if visible mold growth is present, sampling is unnecessary.** Since no EPA or other federal limits have been set for mold or mold spores, sampling cannot be used to check a building's compliance with federal mold standards. Surface sampling may be useful to determine if an area has been adequately cleaned or remediated. Sampling for mold should be conducted by professionals who have specific experience in designing mold sampling protocols, sampling methods and interpreting results. Sample analysis should follow analytical methods recommended by the American Industrial Hygiene Association (AIHA), the American Conference of Governmental Industrial Hygienists (ACGIH), or other professional organizations.

## Are there federal regulations or standards regarding mold testing?

Standards or Threshold Limit Values (TLVs) for airborne concentrations of mold, or mold spores, have not been set. Currently, there are no EPA regulations or standards for airborne mold contaminants.

* Read the publication, ["A Brief Guide to Mold, Moisture, and Your Home"](https://www.epa.gov/mold/brief-guide-mold-moisture-and-your-home) **[EPA 402-K-02-003]**
* Read the publication ["Mold Remediation in Schools and Commercial Buildings](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide) **[EPA 402-K-01-001, March 2001]**

**Frequently Asked Questions**

## Mold and Moisture

* [Can mold cause health problems?](https://iaq.zendesk.com/hc/en-us/articles/211432938-Can-mold-cause-health-problems-)
* [Are there Federal regulations or standards regarding mold?](https://iaq.zendesk.com/hc/en-us/articles/212104637-Are-there-Federal-regulations-or-standards-regarding-mold-)
* [Has EPA issued specific recommendations on how frequently carpet should be cleaned?](https://iaq.zendesk.com/hc/en-us/articles/212104627-Has-EPA-issued-specific-recommendations-on-how-frequently-carpet-should-be-cleaned-)
* [Does ultraviolet (UV) radiation from UV lamps kill mold?](https://iaq.zendesk.com/hc/en-us/articles/211432918-Does-ultraviolet-UV-radiation-from-UV-lamps-kill-mold-)
* [Does carpet cause IAQ problems in schools?](https://iaq.zendesk.com/hc/en-us/articles/211432928-Does-carpet-cause-IAQ-problems-in-schools-)
* [How can I tell if I have a mold problem?](https://iaq.zendesk.com/hc/en-us/articles/212104617-How-can-I-tell-if-I-have-a-mold-problem-)
* [How do I get rid of mold?](https://iaq.zendesk.com/hc/en-us/articles/211432908-How-do-I-get-rid-of-mold-)
* [How does mold affect people with asthma?](https://iaq.zendesk.com/hc/en-us/articles/212104597-How-does-mold-affect-people-with-asthma-)
* [How do molds affect people?](https://iaq.zendesk.com/hc/en-us/articles/212104607-How-do-molds-affect-people-)
* [Is sampling/testing for mold necessary?](https://iaq.zendesk.com/hc/en-us/articles/212104587-Is-sampling-testing-for-mold-necessary-)
* [Should I have the air ducts in my home cleaned?](https://iaq.zendesk.com/hc/en-us/articles/211432898-Should-I-have-the-air-ducts-in-my-home-cleaned-)
* [Should I test or sample for mold in my home using the Environmental Relative Moldiness Index, or ERMI?](https://iaq.zendesk.com/hc/en-us/articles/211432888-Should-I-test-or-sample-for-mold-in-my-home-using-the-Environmental-Relative-Moldiness-Index-or-ERMI-)
* [What about mold in large buildings?](https://iaq.zendesk.com/hc/en-us/articles/212104577-What-about-mold-in-large-buildings-)
* [What about schools, mold, and indoor air quality?](https://iaq.zendesk.com/hc/en-us/articles/212104567-What-about-schools-mold-and-indoor-air-quality-)
* [Should I use bleach to clean up mold?](https://iaq.zendesk.com/hc/en-us/articles/211432878-Should-I-use-bleach-to-clean-up-mold-)
* [What does mold smell like?](https://iaq.zendesk.com/hc/en-us/articles/211432858-What-does-mold-smell-like-)
* [What are the basic mold cleanup steps?](https://iaq.zendesk.com/hc/en-us/articles/211432868-What-are-the-basic-mold-cleanup-steps-)
* [What are the main ways to control moisture in your home?](https://iaq.zendesk.com/hc/en-us/articles/212104537-What-are-the-main-ways-to-control-moisture-in-your-home-)
* [What are ten things I need to know about mold?](https://iaq.zendesk.com/hc/en-us/articles/212104547-What-are-ten-things-I-need-to-know-about-mold-)
* [What are some common asthma triggers?](https://iaq.zendesk.com/hc/en-us/articles/212104557-What-are-some-common-asthma-triggers-)
* [What is the difference between Mold and Mildew?](https://iaq.zendesk.com/hc/en-us/articles/212104527-What-is-the-difference-between-Mold-and-Mildew-)
* [What is mold?](https://iaq.zendesk.com/hc/en-us/articles/211432848-What-is-mold-)
* [Who can test my home or clean, fix and remediate my home for mold?](https://iaq.zendesk.com/hc/en-us/articles/211432838-Who-can-test-my-home-or-clean-fix-and-remediate-my-home-for-mold-)

[Why is mold growing in my home?](https://iaq.zendesk.com/hc/en-us/articles/211432828-Why-is-mold-growing-in-my-home-)

## Organizations, Local Help and Outreach

### Find Public and Private Organizations

The following list of resources includes information created and maintained by other public and private organizations. The U.S. EPA does not control or guarantee the accuracy, relevance, timeliness or completeness of this outside information. Further, the inclusion of such resources is not intended to endorse any views expressed or products or services offered by the author of the reference or the organization operating the service on which the reference is maintained.

* [Resource List for Public and Private Organizations Dealing with Environmental Exposures](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-7)

Each EPA Regional Office is responsible within its states for the execution of the Agency's programs. Use the [Indoor Air Quality Map](https://www.epa.gov/indoor-air-quality-iaq/epa-regional-office-and-state-indoor-air-quality-information) to find regional information about your EPA Regional Office relating to indoor air quality issues (e.g., radon, indoor air quality, asthma, mold, IAQ Tools for Schools, etc.)

# Mold Remediation in Schools and Commercial Buildings Guide

The content on this web page is based on the publication [Mold Remediation in Schools and Commercial Buildings](https://www.epa.gov/mold/printable-version-mold-remediation-schools-and-commercial-buildings)[EPA 402-K-01-001, Reprinted September 2008]. Updates have been made to some resources and links.

* [Guidance Introduction](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-1)
* [Mold Prevention](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-2)
* [Investigating, Evaluating & Remediating Moisture & Mold Problems](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-3)
* [Table 1: Water Damage - Cleanup and Mold Prevention](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-4)
* [Table 2: Mold Remediation Guidelines](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-5)
* [Checklist for Mold Remediation](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-6)
* [Resources List](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-7)
* [References](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-8)
* [Glossary (Appendix A)](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-9)
* [Introduction to Molds (Appendix B)](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-10)
* [Communicating with Building Occupants (Appendix C)](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-11)
* [Acknowledgements](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#tab-0)

## Introduction

Molds gradually destroy the things they grow on. By controlling moisture and eliminating mold growth you can:

* Prevent damage to building materials and furnishings
* Save money
* Avoid potential health risks

Concern about indoor exposure to mold has been increasing as the public becomes aware that exposure to mold can cause a variety of health effects and symptoms, including allergic reactions. This document presents guidelines for the remediation/cleanup of mold and moisture problems in schools and commercial buildings; these guidelines include measures designed to protect the health of building occupants and remediators. It has been designed primarily for:

* Building managers
* Custodians
* Others who are responsible for commercial building and school maintenance

It should serve as a reference for potential mold and moisture remediators. Using this document, individuals with little or no experience with mold remediation should be able to make a reasonable judgment as to whether the situation can be handled in-house. It will help those in charge of maintenance to evaluate an in-house remediation plan or a remediation plan submitted by an outside contractor[1](https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide#IntroMold1). Contractors and other professionals who respond to mold and moisture situations in commercial buildings and schools may also want to refer to these guidelines.

**Molds can be found almost anywhere**; they can grow on virtually any organic substance, as long as moisture and oxygen are present. There are molds that can grow on wood, paper, carpet, foods, and insulation. When excessive moisture accumulates in buildings or on building materials, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. **It is impossible to eliminate all mold and mold spores in the indoor environment. However, mold growth can be controlled indoors by controlling moisture indoors.**

Molds reproduce by making spores that usually cannot be seen without magnification. Mold spores waft through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. Molds gradually destroy the things they grow on.

Many types of molds exist. **All molds have the potential to cause health effects.** Molds can produce allergens that can trigger allergic reactions or even asthma attacks in people allergic to mold. Others are known to produce potent toxins and/or irritants. Potential health concerns are an important reason to prevent mold growth and to remediate/clean up any existing indoor mold growth.

Since mold requires water to grow, it is important to prevent moisture problems in buildings. Moisture problems can have many causes, including uncontrolled humidity. Some moisture problems in buildings have been linked to changes in building construction practices during the 1970s, 80s and 90s. Some of these changes have resulted in buildings that are tightly sealed, but may lack adequate ventilation, potentially leading to moisture buildup. Building materials, such as drywall, may not allow moisture to escape easily. Moisture problems may include:

* Roof leaks
* Landscaping or gutters that direct water into or under the building
* Unvented combustion appliances
* Delayed maintenance or insufficient maintenance are also associated with moisture problems in schools and large buildings

Moisture problems in portable classrooms and other temporary structures have frequently been associated with mold problems. For more information see [IAQ Design Tools for Schools - Portable Classrooms](https://www.epa.gov/iaq-schools/maintain-portable-classrooms-part-indoor-air-quality-design-tools-schools).

When mold growth occurs in buildings, adverse health problems may be reported by some building occupants, particularly those with allergies or respiratory problems. Remediators should avoid exposing themselves and others to mold-laden dusts as they conduct their cleanup activities. Caution should be used to prevent mold and mold spores from being dispersed throughout the air where they can be inhaled by building occupants.

**EPA in Alaska**

## Contact Information

EPA Alaska Operations Office  
222 W. 7th Ave. #19  
Anchorage, AK 99513-7588  
907-271-5083