Mold in Your Home

A 15- to 30-Minute Lesson for Small Groups

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Desired Outcomes

After this program, participants will:

1. Be able to identify if mold is a problem in their homes by using their senses of sight and smell.
2. Be able to identify resources available from their county Extension office for proper cleanup of a mold problem.
3. Know how mold can impact health.
4. Know that chlorine bleach and ammonia are a deadly mix.
5. Know what conditions are right for mold to grow.
6. Know where mold most often grows in a home.

Before the Lesson

1. Read through this lesson plan and the publication *Remove Mold for a Healthy Home,* NDSU Extension Service AE-1202. Additional resources are at http://www.homemoisture.org .
2. Obtain copies of the *Remove Mold* publication for all participants from the county Extension office.
3. Make sure time, space and participant number are right for the activities you plan.
4. Additional program ideas include:
   A. Have participants list things that mold helps produce (cheese, medicines).
   B. Display *Keep Your Home Healthy* posters.
   C. Demonstrate a wood moisture meter, which is available from the Extension office.
5. Make copies of the post-lesson assessment if you choose to use it. Return them to your county Extension office after they've been completed. The Extension office will forward them to Ken Hellevang for tabulation.

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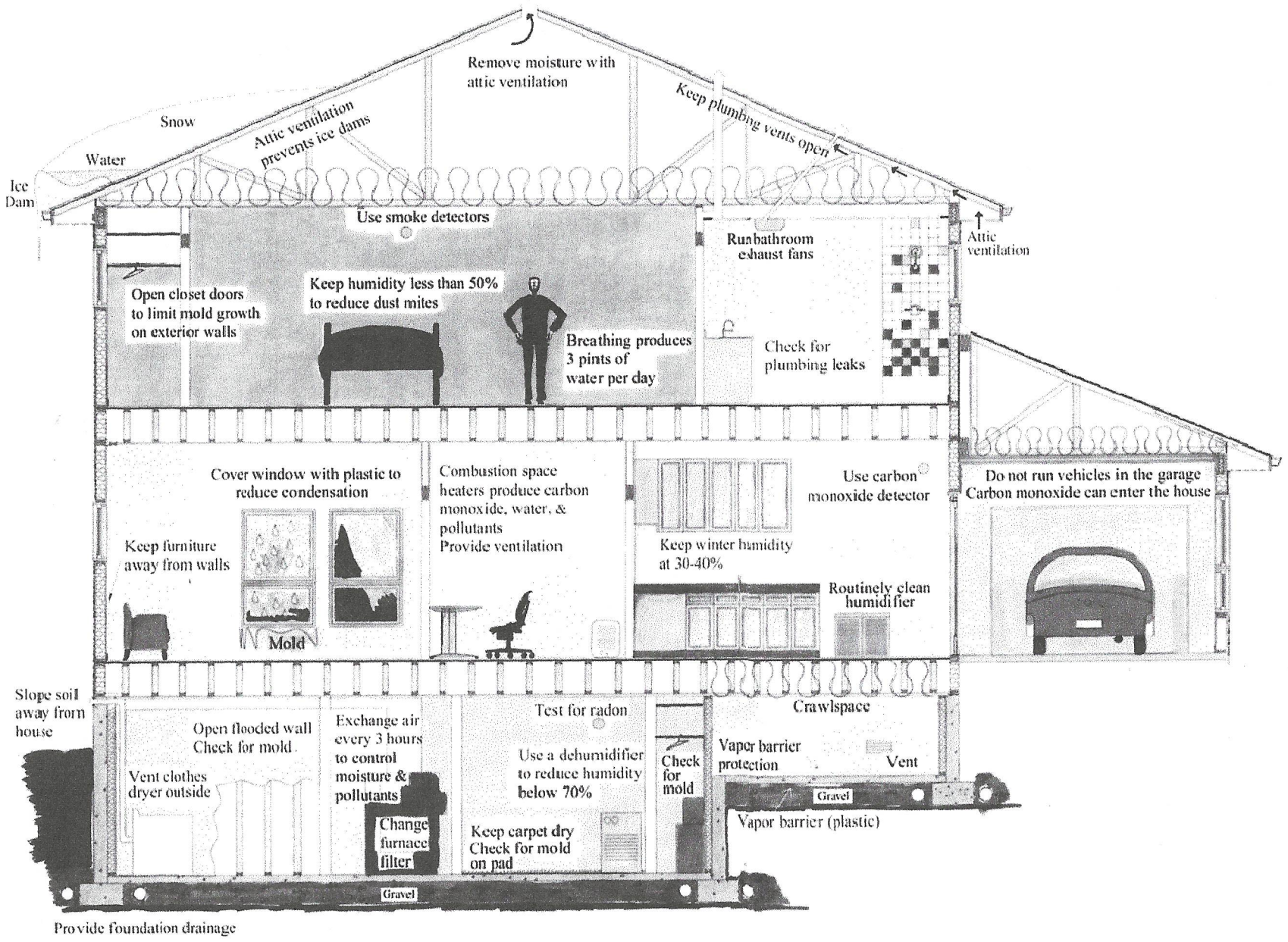

Keep Your Home Healthy Poster

Roll Call Idea

Name locations where you've seen mold grow inside or outside.

Visual #1

Mold in Your Home

Explanation

Have you ever come upon a pile of old leaves and turned the leaves over to find a growth of mold? Mold is everywhere inside and outside. Can you name some places where mold is apt to grow? (Ask participants to name places where mold can grow. Answers may include greenhouses, farms, compost piles, wooded or shaded areas, lake areas, about anyplace since mold spores are everywhere and just need moisture to grow.)

Mold can grow anywhere there is moisture. For this lesson, we will talk about mold in the home and classify mildew as mold too. We will explore why some people are more at risk for allergies to mold, and we will learn that mold can be good but can also impact our health.

Visual #2

Health Effects of Mold

- Watery or itchy eyes
- Sore throat
- Stuffed up nose
- Coughing
- Skin irritations
- May trigger asthma attacks

What are the health risks from exposure to mold? Some people are very sensitive to mold. A small amount can trigger reactions such as a sore throat, itchy eyes and nasal stuffiness. Severe reactions may be shortness of breath and fever. Mold may even trigger asthma attacks and cause respiratory problems.

Visual #3

Who's at Most Risk?

- Infants and young children
- Pregnant women
- People with lower immunities
- The elderly
- Asthma suffers

Some people are at higher risk for adverse reactions to mold. Infants and young children, pregnant women, individuals who have lowered immunities, the elderly and asthma sufferers are at greater risk.

- Infants and young children are at risk because their immune systems are still immature.
- People whose immune systems aren't working at normal levels are susceptible to mold reactions. This group includes people who have had surgery recently and those with cancer, AIDS and other diseases.
- Seniors may be at more risk due to chronic problems. As we age, our immune systems weaken.
- Mold can trigger attacks in people with asthma.

Visual #4

Recognizing Mold

- Use your eyes: look for it
- Use your nose: smell for musty odors
- Experiencing health effects of mold

If you smell a musty odor or see mold, you have a problem. You can have your home tested for mold, but it is very expensive and generally is not necessary if you smell or see mold.

If you've ever walked into a closed-up home or entered an old building, you may have smelled a musty odor. Sometimes your nose tightens up, or you might even get a headache. If you re-enter your home or cabin after it's been locked up, you may smell a musty odor. This odor is caused by mold. Find where the odor is most intense to see if mold is present.

Since the sense of smell decreases rapidly, it is best to smell for mold after being away for a while.

Visual #5

What is Required for Mold to Grow?

- Food source of organic material such as drywall, carpet, wallpaper
- Moisture
- Moderate temperature

Mold needs a food source. It grows on organic materials, such as paper, dirt, wood and soap scum. Even materials that seem solid are often cellulose based so can be a food source for mold.

Visual #6

Moisture Sources

- Water leaks
- Flooded areas
- Humidity levels above 65% – 70%
- Condensation

The moisture required for mold to grow can come from water leaks, flooded areas, high humidity, condensation and other sources. What are some other moisture sources in the home?

Show the Keep Your Home Healthy poster, and ask participants to name a few places where mold can grow and possible solutions.

Visual #7

Protect Yourself when Removing Mold

- Respirator or mask to filter mold spores
- Rubber gloves
- Eye protection

Some individuals react to mold whether it is living or dead. The mold must be removed either way. When removing mold, protect your health by using a respirator or two-strap mask to filter out mold spores, wearing eye protection and using rubber gloves. Suggested masks are N-95, 3M #1860 or TC-21C. Immediately wash clothes after completing removal of mold.

Visual #8

Remove Mold

- Clean with detergent and brush
- Disinfect with chlorine bleach solution
- Rinse with water and dry quickly

It is impossible to completely remove mold from porous surfaces such as paper, drywall and carpet padding, so these materials should be removed and discarded.

To remove mold from the surface of non-porous materials, first scrub with a brush and detergent solution. Ventilate the work area well. Then disinfect with a chlorine bleach solution. A clean surface requires less bleach than a dirty surface. A solution of ¼ cup chlorine bleach (sodium hypochlorite) to 1 gallon of water should be adequate for clean surfaces. Leave the bleach solution on the surface for 15 minutes, then rinse with water and dry quickly. Just splashing full-strength bleach on mold is not effective. It must be cleaned.

Air cleaners and ozone machines will not solve a mold problem. A high-efficiency air filter that removes mold spores may reduce the number of spores in the air, but the spores rapidly settle onto surfaces where air filters cannot remove them.

Visual #9

Never Mix Chlorine Bleach and Ammonia

- The fumes are toxic

Don't mix ammonia with chlorine bleach. The fumes of this mixture can quickly overcome you and can be deadly. Check the ingredient list to verify the cleaner does not contain ammonia.

If time allows, pass around cleaners that list chlorine bleach (sodium hypochlorite) as an ingredient to identify those that should not be combined with ammonia. Many mold and mildew bath cleaners contain bleach.

Visual #10

Dry Out Before Rebuilding

- Wood should be less than 15% moisture

If structural wood pieces, like studs, have stood in water, they need time to dry out. Moisture meters are available for free checkout from county Extension offices. These meters will show if the wood is below 15 percent moisture. If it is, you can replace drywall and similar materials. Even if the wood feels dry, it may still be too wet for rebuilding.

Moisture problems must be fixed to prevent future mold growth. Since there are some mold spores everywhere and since mold grows on any wet organic surface, the only way to prevent mold growth is to keep things dry.

Have copies of Cleaning Your Flooded or Water Damaged Home, NDSU Extension Service fact sheet, if participants have more questions or concerns.

Optional: Have participants complete the post-lesson assessments and send them to your Extension office.

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Mold Removal

Since people react to mold whether it is living or dead, the mold must be removed. Take steps to protect your health during mold removal. Use a mask or respirator that will filter out mold spores. Usually it will be designated as an N95, 3M #1860 or TC-21C particulate respirator. Wear eye protection, rubber gloves and clothing that can be immediately laundered. Dampen moldy materials before removal to minimize the number of airborne mold spores. Mold can be removed from hard surfaces such as hard plastic, glass, metal and counter tops by scrubbing with a non-ammonia soap or detergent. (Do not mix ammonia and bleach; the fumes are toxic.) It is impossible to completely remove mold from porous surfaces such as paper, Sheetrock (drywall) and carpet padding, so these materials should be removed and discarded.

Scrubbing may not completely remove mold growth on structural wood, such as wall studs, so it may need to be removed by sanding. Wear personal protective gear and isolate the work area from the rest of the home. After the mold is removed, disinfect the area using a bleach and water solution or another disinfectant. The amount of bleach recommended per gallon of water varies considerably. A clean surface requires less bleach than a dirty surface. A solution of 1/4 cup to 1/2 cup bleach to 1 gallon of water should be adequate for clean surfaces. The surface must remain wet for about 15 minutes to allow the solution to disinfect. Concentrations as high as 1½ cups of bleach per gallon of water are recommended for wood and concrete surfaces that could not be thoroughly cleaned. Provide adequate ventilation during disinfecting and wear rubber gloves. Finally, rinse the entire area with clean water, and then rapidly dry the surfaces. Use fans and dehumidifiers or natural ventilation that exchanges inside air with outside air.

Preventing Mold Growth

The moisture problem must be fixed to prevent future mold growth. Since there are some mold spores everywhere and since mold grows on any wet organic surface, the only way to prevent mold growth is to keep things dry.

Air Cleaners

Air cleaners will not solve a mold problem. A high-efficiency air filter that removes mold spores may reduce the number of spores in the air, but mold spores rapidly settle onto surfaces, such as the floor, where air filters cannot remove them. Filters may reduce the number of mold spores in the air but are not substitutes for removing the mold. Air cleaners that produce ozone are not effective at eliminating mold. Ozone is a lung irritant that should not be in an occupied space.

Eliminating Mold

Remove mold and clean surfaces
Disinfect
Rinse and dry quickly

Remove Mold for a Healthy Home

Remove Mold for a Healthy Home
AE-1202, Revised
Kenneth Hellevang, Ph.D., Engineer, NDSU Extension Service

Exposure to mold can cause cold-like symptoms, respiratory problems, nasal and sinus congestion, watery eyes, sore throat, coughing and skin irritations, and can trigger asthma attacks. Because some mold spores are very small and can easily be breathed deeply into the lungs, it is not safe to live in houses with high mold levels. Exposure to high mold spore levels can cause development of an allergy to mold. People can react to mold whether it is living or dead.

Everyone should minimize their exposure to mold. Children, the elderly, pregnant women and people with existing respiratory sensitivities are at higher risk for adverse health effects from mold. Some people are affected when exposed to very little mold, while others may show no adverse health symptoms when exposed to mold.

If you can smell a musty odor or see mold, you have a mold problem. Reliable sampling for mold can be expensive since it requires special equipment and training. Testing is not generally recommended as a first step.

Where to Look for Mold

Mold grows on organic materials, such as paper, dirt, wood and soap scum. Mold grows on moist materials, so mold growth is likely in areas wet by water leaks, flooding, humidity levels above about 70 percent and condensation. Any flooded area that was not completely dried within about one day is likely to have mold growth. Walls need to be opened and rapidly dried to prevent mold growth. Any area that is stained from water should be examined for mold growth. Peeling paint may be an indication of wet walls.

Moisture seeping through concrete walls and floors will cause moist conditions likely to cause mold growth on or in walls, carpeting and materials stored in the basement. Mold often grows under cabinets, behind coverings. An unvented clothes dryer creates a very humid, warm environment conducive to mold growth. Closets may have mold growth if clothing is damp or if there is a cool outside wall in the closet. Also, there is a chance mold might be growing behind furniture, particularly against an outside wall. Mold will not normally be found in furnace or air-conditioning ducts unless they were flooded because the heated or air-conditioned air is very dry.

Moisture coming through a basement floor or wall may deposit a light-colored salt and other minerals that are sometimes thought to be mold. The deposits should quickly dissolve and disappear when wet with water if they are a salt.

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