



Unit 5

Protecting Your Home from Fires

Objectives: At the end of this unit, participants will be able to:

- 1. Name three types of alarm systems that protect your home and family from fires.*
- 2. Describe four ways to create fire-safe landscaping in wildland-urban interface.*
- 3. List two mitigation measures that reduce the homeowner's susceptibility to wildfires.*
- 4. Describe five fire safety precautions in preventing electrical fires.*
- 5. Describe four precautionary measures homeowners should take during the holiday season.*
- 6. Explain why older Americans are at a greater risk of fire mishaps than the rest of the population.*

INTRODUCTION

Every day Americans experience the tragedy of fire. Each year more than 4,500 Americans die in fires and more than 30,000 are injured. The tragedy is that fires kill more Americans than all natural disasters combined. Fortunately, unlike other disasters, most fire losses can be prevented through effective public education and awareness initiatives.

In areas known as wildland-urban interface, the risk of fire destroying homes and property greatly increases. More people are making their homes in woodland settings – in or near forests, rural areas or remote mountain sites. There, homeowners enjoy the beauty of the environment but face the very real danger of wildfire. The wildland-urban (also known as rural-urban) interface is the area where homes and structures meet the natural environment of forests and wildlands.

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Whether simple cabins, mobile homes, or large expensive developments -- many are constructed in the wakes of past fires and in the path of future fires. In areas where wildfires have occurred naturally for centuries, homes and gardens now add fuels that can accelerate the spread of fire. When wildfires occur today in these areas, limited resources often force fire fighters to choose between attacking the fire or defending the home.

There are time-tested ways to prevent a fire. It's not a question of luck. It's a matter of planning ahead.

If you aren't sure whether your house is at risk from wildfires, check with your local fire marshall, building official, city engineer, or planning and zoning administrator. They can tell you whether you are in a wildfire hazard area. Also, they usually can tell you how to protect yourself and your house and property from wildfires.

Fire protection can involve a variety of changes to your house and property -- changes that can vary in complexity and cost. You may be able to make some types of changes yourself. But complicated or large-scale changes and those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city.

If you live in the wildland-urban interface, you must increase your role to protect lives and property in your community beyond the city limits. Before we address the things you can do to increase your protection from wildfires, let's take a look at some important facts about rural living:

- Once a fire starts outdoors in a rural area, it is often hard to control. Wildland firefighters are trained to protect natural resources, not homes and buildings.
- Many homes are located far from fire stations. The result is longer emergency response times. Within a matter of minutes, an entire home may be destroyed by fire.
- Limited water supply in rural areas can make fire suppression difficult.
- Homes may be secluded and surrounded by woods, dense brush, and combustible vegetation that fuel fires.

PROTECTING YOUR HOME FROM WILDFIRES

This section includes mitigation steps that will protect your home and family during a wildfire or help to prevent a fire.

1. **Replace flammable roofing with fire-resistant materials.** Some roofing materials, including asphalt shingles and especially wood shakes, are less resistant to fire than others. When wildfires and brush fires spread to houses, it is often because burning branches, leaves, and other debris buoyed by the heated air and carried by the wind fall on roofs. If the roof of your house is covered with wood or asphalt shingles, you should consider replacing them with fire-resistant materials like stone, brick and metal to protect your home.

As shown in the figure, you can replace your existing roofing materials with slate, terra cotta or other types of tile, or standing-seam metal roofing. Replacing roofing materials is difficult and dangerous work. Unless you are skilled in roofing and have all the necessary tools and equipment, you will probably want to hire a roofing contractor to do the work. Also a roofing contractor can advise you on the relative advantages and disadvantages of various fire-resistant roofing materials.



Tips

Keep these points in mind if you plan to have your existing roofing materials replaced:

- Tile, metal, and slate are more expensive roofing materials, but if you need to replace your roofing anyway, it may be worthwhile to pay a little more for the added protection these materials provide.
- Slate and tile can be much heavier than asphalt shingles or wood shingles. If you are considering switching to one of these heavier coverings, your roofing contractor should determine whether the framing of your roof is strong enough to support them.
- If you live in an area where snow loads are a problem, consider switching to a modern standing-seam metal roof, which will usually shed snow efficiently.

Estimated Cost. If you hire a contractor to replace your existing roof covering, you can expect to pay about \$4 per square foot of roof area for tile or metal roofing and about \$7 per square foot of roof area for slate. For example, a house measuring 60 feet by 30 feet will have about 1,800 square feet of roof area. So for this house, tile or metal roofing would cost about \$7,200 and slate would cost about \$12,600.

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- 2. Remove vegetation and combustible materials.** If the area immediately surrounding your house contains trees, shrubs, and other vegetation; yard debris; or other materials that burn easily, your house will be at an increased risk of damage during wildfires and forest fires. These combustible materials provide a path by which fire from nearby areas can reach your house. Reduce excess leaves, plant parts and low-hanging branches.

You should clear the area around your house. Shrubs, brush, woodpiles, and combustible debris should be removed within a radius of 30 feet. The distance between your house and any nearby tree should always be greater than the height of the mature tree or at least 10 feet. Similarly, any outbuildings, such as storage sheds, should be at least as far away as their height.



Tips

Keep these points in mind when you remove vegetation and other combustible materials from around your house:

- Removing large trees near your house can be very dangerous, for both you and your house, and is therefore a job for a skilled contractor.
- Rather than plant shrubs near your house, consider landscaping alternatives such as creating a rock garden.

Estimated Cost. If you hire a contractor to remove a large tree, you can expect to pay about \$300 to \$500. The charge for removing smaller trees and shrubs will be less.

TIPS FOR FIREPROOFING YOUR PROPERTY

- ❖ Keep lawns trimmed, leaves raked, and the roof and rain-gutters free from debris such as dead limbs and leaves.
- ❖ Beyond 30 feet, remove dead wood, debris and low tree branches. Stack firewood at least 30 feet away from your home.
- ❖ Store flammable materials, liquids and solvents in metal containers outside the home at least 30 feet away from structures and wooden fences.
- ❖ Post home address signs that are clearly visible from the road.
- ❖ Provide emergency vehicle access with properly constructed driveways and roadways, at least 12 feet wide with adequate turnaround space.

- ❖ Make sure water sources, such as hydrants and ponds, are accessible to the fire department.
- ❖ Burning yard waste is a fire hazard. Check with your local fire department on a non-emergency number for fire permit requirements and restricted burning times.

FIRE-SAFE LANDSCAPING

Wildland fires destroy hundreds of homes and acres of land every year across the country. Fire-safe landscaping is an effective tool that creates an area of defensible space between your home and flammable vegetation that protects against devastating fires. This section gives specific details on fire-safe landscaping, including landscape design, pruning, maintenance and water management, in areas known as the wildland-urban interface.

LANDSCAPE DESIGN

Firewise designs incorporate the needs of relatively public and formal front yards and more private and personal backyards, the structure, and surrounding properties. Often firewise techniques such as subtle adjustments in plant selection and placement can improve fire safety and meet the needs of the homeowner and the requirements of the environment.



Listed below are nine fire-safe landscaping tips:

- 1. Create a defensible space perimeter** by thinning trees and brush within 30 feet around your home.

During the 1993 raging Malibu fires, a number of homes were saved as a result of the owners' careful pruning and landscaping techniques that protected their homes. In a fire situation, the dead trees and shrubs surrounding your home act as fuel for fire. Removing flammable vegetation reduces the threat of fire. Follow these basic rules to create defensible space that works:

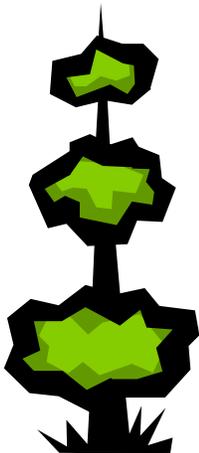
- Remove all dead plants, trees and shrubs from the site.
- Reduce excess leaves, plant parts and low-hanging branches.
- Replace dense flammable plants with fire-resistant plants.

The choice of plants, spacing, and maintenance are crucial elements in any defensible space landscaping plan.

- 2. Landscape your property with fire-resistant plants and vegetation** to prevent fire from spreading quickly.

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- Check your local nursery or county extension service for advice on fire resistant plants that are suited for your environment.
 - There are no “fire-proof” plants. Select high moisture plants that grow close to the ground and have a low sap or resin content.
 - Choose plant species that resist ignition such as rockrose, iceplant, and aloe.
 - Fire-resistant shrubs include hedging roses, bush honeysuckles, currant, cotoneaster, sumac, and shrub apples.
 - Plant hardwood, maple, poplar and cherry trees that are less flammable than pine, fir, and other conifers.
3. Eliminate small trees and plants growing under trees. They allow ground fires to jump into tree crowns.
 4. Space trees 30 feet apart and prune to a height of 8 to 10 feet.
 5. Place shrubs at least 20 feet from any structures and prune regularly.
 6. Plant the most drought-tolerant vegetation within 3 feet of your home and adjacent to structures to prevent ignition.
 7. Provide at least 10 to 15-foot separation between islands of shrubs and plant groups to effectively break-up continuity of vegetation.
 8. Create fire-safe zones with stone walls, patios, swimming pools, decks, and roadways.
 9. Use rock, mulch, flowerbeds and gardens as ground cover for bare spaces and as effective firebreaks.



PRUNING

Maintain a well-pruned and watered landscape to serve as a green belt and protection against fire. As trees grow, careful pruning preserves their appearance, structural integrity, and functional values. But pruning also maintains its ability to resist fire. Pruning tree branches at least 6-10 feet from the ground helps to interrupt the fire's path.

Pruning cuts should be clean and smooth, avoiding flush cuts and stubs. A well-pruned tree heals quickly while poor pruning results in scarring and possible disease. No more than one-third of a tree's live foliage should be removed at one time to avoid stress.

Young, vigorous trees can withstand more severe pruning than older, weaker trees. Remove dead and diseased branches from trees. This reduces the potential for fire spreading into the crown. Shrubs should be well spaced to break up the fire ladder and keep the vegetation density low. Except for formal clipped or sheared shrubs, shrubs should be maintained by thinning, maintaining size, and removing excess leaf litter.

Vines and ground covers can build up heavy underbrush of dead leaves and branches, which should be removed to lessen fuel for fire. Remove or mow dry grasses, weeds and underbrush.

Mulch over bare soil can provide many benefits while adding little fire risk. Even in healthy landscapes, the buildup of leaf litter and other debris can give fires a chance to start under porches and decks and on roofs.

MAINTENANCE AND FIRE SAFETY

Landscapes that are easy to maintain are more desirable than highly complex arrangements that may be neglected. Over time, plants grow and spread; mulches dry out; leaves and pine needles accumulate. All contribute to the fuels which can accelerate a wildfire. Proper maintenance improves the appearance of plants and helps protect your home from wildfire.

Fire needs fuel -- something to burn, like grass, trees, or the homes nestled among them. To an interface fire, homes and other structures become merely fuel. Fires start easily and burn rapidly in light fuels like dry grasses. These, in turn, provide a path to larger fuels like trees. Once at the base of a tree, fire can move into low branches and climb to the top, or crown. This arrangement, known as ladder fuels, provides a path along which to grow and spread.

Interrupting a potential fire's path is a primary concern in maintaining the property and the landscape. A firewise landscape is a healthy landscape - one whose plants are durable, fire resistant, compatible with the fire terrain and climate and well-maintained.

WATER MANAGEMENT

When plants dry out, they become more flammable. Proper watering is, therefore, essential. The results of over-watering and under-watering can be the same -- damaged plants and increased flammable litter.

Irrigation systems -- whether drip or spray-- play an important role in maintaining the health of plants, shrubs and trees. If an irrigation system is not working effectively, vegetation may become stressed and dry, providing wildfire a way to spread to other vegetation. Familiarity with the system, along with routine inspection and maintenance is necessary to keep the landscape in top condition.



SOURCES OF HOME FIRE PROTECTION

There are three types of alarm systems which can be used in the home. You can decide which ones provide the level of assurance you need in protecting your family and home from fire. The following are described below in detail:

- **Smoke detectors**
- **Residential sprinklers**
- **Fire alarms**

SMOKE DETECTORS

Why should my home have smoke detectors?

In the event of a fire, a smoke detector can save your life and those of your loved ones. A working smoke detector can double your chances of survival. They are the single most important means of preventing house and apartment fire fatalities by providing an early warning signal -- so you and your family can escape. Smoke detectors are one of the best safety features you can buy and install to protect.

The smoke detectors currently in place have saved thousands of lives, but several problems exist. First, 12% of homes without detectors have more than half of the fires; second, it is estimated that a third of the detectors in place are not working, often due to failure to replace a worn out battery; and third, many homes do not have as many smoke detectors as are needed to protect the occupants properly.

Where would I get smoke detectors?

Many hardware, home supply or general merchandise stores carry smoke detectors. If you are unsure where to buy one in your community, call your local fire department (on a non-emergency telephone number) and they will provide you with some suggestions. Some fire departments offer smoke detectors for little or no cost.

What kind of smoke detector should I get?

There are two types of home smoke detectors:

- ① the ion type
- ② the photoelectric type

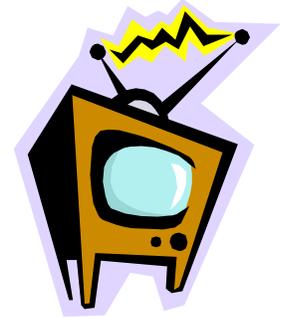
The ion type reacts faster to open flaming fires and is usually the least expensive. The photoelectric type reacts to smoldering fires and is less likely to react to cooking. Both types provide good protection and can be used without worry. If you need more than one detector, you might get one of each.

Okay, how many do I need and where do I put them?

The primary job of your smoke detector is to protect you from fires while you are asleep. Thus, your smoke detector should be located between any sleeping persons and the rest of the house -- outside bedrooms or sleeping areas. But tests conducted in the 1970's clearly showed that this may not be enough.

In multi-story homes, fires on a floor level without a smoke detector can grow to dangerous conditions before sufficient smoke can rise in a stairway to set off a detector on the upper floor. Based on this observation, most codes require that additional smoke detectors be located on each floor level of the home, including the basement.

Many fatal fires begin late at night or in the early morning. A closed door provides protection from smoke on the other side, but will also prevent smoke from reaching a smoke detector. This is particularly a problem in bedrooms. If you sleep with your bedroom door closed, you should add a smoke detector in the bedroom; particularly if you smoke in the bedroom or there is a TV, air conditioner, or other major appliance in the bedroom that might start a fire. If you sleep with the bedroom door open, the detector in the hall outside will detect a fire in the bedroom or elsewhere. For extra safety, install smoke detectors both inside and outside sleeping areas.



There are a few places where a smoke detector should not be placed. These include kitchens and garages (cooking fumes and car exhaust are likely to set them off) and unheated attics and crawl spaces (where it can get too cold or hot for the electronics to work properly). Fires beginning in these areas are generally detected by the other smoke detectors in enough time to escape safely. If a detector is desired in these spaces, heat detectors are available which can be used. But remember that the smoke detectors are the primary safety devices in any home protection scheme.

Are smoke detectors hard to install?

Not a bit. In most cases, all you will need is a screwdriver. Many brands are self-adhesive and will automatically stick to the wall or ceiling where they are placed. However, be sure to follow the directions from the manufacturer because each brand is different. If you are uncomfortable standing on a ladder, ask a relative or friend for help. Some fire departments will actually install a smoke detector in your home for you. Call your local fire department (again, on a non-emergency number) if you have problems installing a smoke detector.

How should they be installed?

Since smoke and many deadly gases rise, installing your smoke detectors at the proper level will provide you with the earliest warning possible. Always follow the manufacturer's installation instructions.



Smoke detectors are normally installed on the ceiling or high on the wall, with the top of the detector not closer than 4 inches nor further than 12 inches from the ceiling. Detectors should be no closer than 3 feet from supply registers of forced air heating systems (that might blow on the detector preventing it from seeing smoke) and no closer than 3 feet from the door to a kitchen or a bathroom containing a shower (steam can set the detector off when the door is opened).

If a detector is mounted on an exterior wall or a ceiling below an unheated attic that is poorly insulated (the surface gets noticeably cold in the winter and warm in the summer); the temperature difference can prevent smoke from getting to the detector. Placing the detector on an inside wall avoids the problem. In desert climates where evaporative coolers are being used, mount smoke detectors on walls 12 inches below the ceiling because the coolers add moisture which can cause the smoke to drop.

Older adults may have difficulty reaching detectors on ceilings to change batteries. If house-powered detectors are impractical, wall mounting 12 inches down should be considered.

How do I keep my smoke detector working?

Smoke detectors are very easy to take care of. There are two steps to remember:

- ① **Simply replace the batteries at least once a year.** Most operate on a battery (usually 9-volt) which should be replaced at least once a year. When the battery needs changing, the smoke detector will begin to "chirp" every 20 seconds or so, which will persist for a month. This is most likely to start in the middle of the night when the temperature in the house drops) so that you have to get up and remove the battery so you can sleep. To prevent this nuisance you should pick a special day and give your detectors new batteries each year on that day. *Tip:* Pick a holiday or your birthday. Some fire safety organizations promote "change your clocks, change your batteries" when the change is made back from daylight savings time each fall. Always make sure that you use the right battery -- the required battery type is marked on the detector near where the battery goes.

Some smoke detectors now on the market come with a 10-year battery. These detectors are designed to be replaced as a whole unit, thus avoiding the need for battery replacement.

- ② **Keep them clean.** Dust and debris can interfere with their operation, so vacuum over and around your smoke detector regularly.

Smoke detectors installed in a new home will be operated from the household electrical power and do not need replacement. These types all have a "power on" light to tell you that the detector has power. Fires do not generally affect the power until they get very large, so it is rare that such detectors fail to work due to a loss of power. However, if there were a power failure due to the weather (i.e., thunderstorms, ice storms, etc.), then the smoke detector would not have power in case there is a fire. Smoke detectors are available which run on house power but also have a battery in case the main power fails. Since the battery is not normally in use, such backup batteries will last about 6 years before they need replacing (the detector will "chirp" like the battery-powered ones).

Will I be able to hear my detectors?

The ultimate test for smoke detectors is their ability to wake you when you're asleep. This generally means that the nearest detector to the bedroom can be no further away than in the next room with the intervening door open.

House-powered detectors can be connected together (with a wire) so that when one detector activates, all interconnected detectors go off. Many detectors in new homes have this feature. It means any detector in the home can awaken you in your bedroom if the nearest detector is loud enough to do so.

For homes with battery-powered detectors, there are models that contain a radio transmitter which will activate a receiver that can be placed in the bedroom. An advantage of this type is that, when you go on vacation, you can give the receiver to a neighbor who could call the fire department if a fire starts. Of course, these are a lot more expensive than the simple smoke detectors.

All battery-powered and most house-powered smoke detectors use a high pitched electronic horn which is difficult for some people to hear. Test detectors before installation to make sure that all members of the household can hear them clearly.

People with hearing impairments can get smoke detectors with bright, flashing lights or vibrating signals. To awaken you, the light needs to be over the head of the bed and should be rated at least 110 candela. Such bright lights must be powered from house power, so if it is battery operated, it is probably not bright enough to use in the bedroom.

What if the alarm goes off while I'm cooking?

Then it's doing its job. Smoke detectors are highly reliable but can sometimes be fooled by cooking or steam. Do not disable your smoke detector if it alarms due to cooking or other non-fire causes. You may not remember to put the batteries back in the detector after cooking. Instead, clear the air by waving a towel near the detector, leaving the batteries in place. The detector may need to be moved a few feet to a new position where it is not in the way of cooking vapors or steam.

Another non-fire cause could be that it has insects in it, so you should take it down and vacuum it out. If it continues to "act up," simply replace it with a new detector (they are too inexpensive to fool with).

How long will my smoke detector last?

About 8 to 10 years, after which they should be replaced, even if they seem to be working. Like most electrical devices, smoke detectors wear out. You may want to write the purchase date with a marker on the inside of your unit. That way, you'll know when to replace it. Always follow the manufacturer's instructions for replacement.

Even though prices of today's smoke detectors are many times lower than you might have paid some years ago, the detectors themselves are generally more reliable. Thus, it is usually not worth keeping an old detector rather than buying a replacement.

What about testing and maintenance?

Smoke detectors should be tested at least once a month. All smoke detectors have a test button which you push to check out the entire detector, including its sensitivity (how much smoke it takes to set it off). If the testing mechanism does not work properly, the detector should be replaced immediately. Never use open flame devices to test a detector.

Older adults and the physically impaired may have problems reaching their detectors to test them. There is one brand of smoke detector on which the test feature can be activated by shining a flashlight on it. Another brand has an automatic test which activates at the same time and day, once a week. These models can be used where proper testing might not otherwise be done.

Smoke detectors need no maintenance other than changing batteries (in those that have batteries) and an occasional vacuuming of dust or cobwebs. Every smoke detector comes with a homeowner booklet which describes how to use and take care of that particular detector. You should read that booklet and keep it in a safe place for future reference.



Anything else I should know?

Reminder: Some smoke detectors are considered to be "hard wired." This means they are connected to the household electrical system and may not have battery backup. It is important to test every smoke detector **monthly**. And always use new batteries when replacing old ones.

RESIDENTIAL SPRINKLERS

Why should I consider a home sprinkler system?

Fire sprinklers have been used to protect commercial buildings for more than 100 years. More recently, a new type of sprinkler system has been developed for residences which offers an unprecedented level of fire safety for both lives and property.

Sprinklers are affordable--they can increase property value and lower insurance rates. New technology will allow sprinklers to be connected directly to your standard home plumbing system. Individual sprinkler heads are only activated where fire strikes. Consider a home sprinkler system whenever renovating, buying or building a house. Contact your local fire department if you need more information.

How much do residential sprinklers cost?

The cost of a sprinkler system is about \$1.50 per square foot in a new home (for a 1000-square foot home this is \$1500). In an existing home they range from \$2.50 to \$5.00 per square foot, depending on how difficult it is to run the pipes. This assumes the availability of adequate and reliable water supply.

How do residential sprinklers differ from commercial sprinklers?

The sprinklers that you have come to expect in hotels, offices, and other commercial buildings are there primarily to protect property and to protect people who are not in the immediate vicinity of the fire's point of origin. Sprinklers work by limiting the size and impact of the fire to a small area. Sprinklers in commercial buildings use larger quantities of water because fires in these types of buildings can involve large fuel loads.

Sprinklers used in the home are a special type referred to as residential sprinklers. These sprinklers use a fast acting element to allow the sprinkler to activate when the fire is still in its very early stages of development. No matter what type of building sprinklers are in, inadvertent operation of the sprinkler system is extremely unlikely. Smaller fuel loads coupled with activation when the fire is smaller allow these sprinklers to require much less water, so much so that the typical home's domestic water system is usually sufficient for such systems.

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Why are sprinklers so powerful?

The primary reason is that as soon as it activates, the sprinkler sprays water on the burning object and puts out or controls the fire. In fact, the sprinkler system not only stops the growth of the fire, it also acts directly on the potentially deadly effect of the fire, for example, by lowering the air temperature.

This means that a combination of sprinklers and smoke detectors can save most potential victims of home fires. The principal exceptions are victims of clothing fires, explosions, or flash fires. For some potential victims, there is no substitute for prevention.

What about water damage?

Unlike fires you often see on TV and in the movies, in a real fire, only one or two sprinklers near a fire activate and discharge water. Residential sprinklers discharge water at a low rate, so your home will not be flooded. (Flooding is not a danger with sprinklers in commercial buildings either.) After the fire is out, the supply valve can be simply shut off -- *but never do this yourself*. Always call the fire department and let the professionals determine when it is safe to shut off the water.

Do you need smoke detectors too?

YES! When home fire sprinklers are used with working smoke detectors, your chances of surviving a fire are greatly increased. Smoke detectors will tend to react first, providing extra time to escape. In some fires, sufficient smoke can be released to impair judgment or even threaten persons with pre-existing medical problems before enough heat is released to set off the sprinkler. Also, smoke detectors provide early warning of fires that may start out of range of the sprinklers, such as within a wall space. Therefore, it is important that smoke detectors be installed in all of the places discussed earlier in this section.

FIRE ALARM SYSTEMS

What is a fire alarm system?

A home fire alarm system is usually part of a total security system providing burglary protection in addition to fire protection. Such a system supervises doors and windows and spaces within the home for break-in and may also provide monitoring services by dialing your telephone to report a fire or intrusion to a security office, where it will be reported to your local police or fire department.



Due to their relatively high cost, these systems are generally found only in larger homes. The system can cost \$1000 or more to install, with 24-hour monitoring service adding \$15 to \$20 per month.

Components of the system

These systems consist of a central control panel to which smoke and heat detectors are connected, along with bells or horns that are activated when the system triggers an alarm. Other sensors associated with the burglary functions connect to doors and windows or monitor rooms for motion or body heat. The control panel operates from house power but also usually contains an emergency battery which can operate the system for about 24 hours during a power outage.

The basic requirements for the number and location of detectors are exactly the same as with the self-contained detectors discussed previously. The difference is that a fire alarm system gives you more flexibility to locate additional detectors and additional bells or horns (or flashing lights, should a person in the household be hearing impaired).

Fire alarm systems that provide remote monitoring services can also be used to provide medical alert services. Here, a person with health problems who lives alone carries a radio transmitter that can trigger the system in case they need assistance. Signals received at the monitoring station are identified by type (fire, burglary, medical alert) so that the proper response can be made.

Why have a residential fire alarm system?

The primary advantage of a home fire alarm system is increased reliability and the ability to place detectors and bells exactly where needed. However, the reason most people have them is that they wanted a burglar alarm system and the cost of adding fire alarm features to a residential burglary system is relatively small.

Another advantage is that they are the only way to obtain remote monitoring services. This becomes important in cases where family members may not be capable of escaping from a fire without assistance. For example, if you have an older or physically impaired person in your home and a fire started when no one was home to assist that person, detectors alone might not be enough to assure their safety.

A feature of most monitoring services is the ability to keep special information on the residence which comes up on a computer screen whenever an alarm is received from that home. Thus, if there is a disabled person in the home who needs special assistance, this fact will be known to the operator and can be passed along to the fire department when they are called.

FIRES THAT START IN THE HOME

Many Americans believe that "fires only happen to other people – not to me and not in my home." Yet over 70 percent of fire deaths occur in residences, most often claiming the lives of the young, the elderly and the disadvantaged. Now, let's take a look at mitigation tips for residential fires.

1. Alter security bars in your home. Security bars may help keep your family safe from intruders, but they can also trap you in a deadly fire! By following the steps below you reduce the chances of security bars being a danger during a fire.

- *Use quick release devices on barred windows and doors.* Windows and doors with security bars should have quick release devices to allow them to be opened immediately in an emergency. These devices operate from inside and allow the bars to be opened for emergency escape without compromising the security of your home. The quick release devices should be easy to open without the use of a key, detailed knowledge or great physical effort. Release devices vary by region and manufacturer. Contact your local fire department on a non-emergency number for approved release devices available in your area.
- *Retrofit current security bars.* Security bars on windows and locked doors prevent escape from fire and also impede firefighters' rescue attempts. If the security bars in your home are permanently fixed or do not have quick release devices, they should be retrofitted with release devices.
- *Be aware of security bar issues when practicing fire escape routes.* Know and practice fire escape plans monthly, and use them to identify and correct obstructions of windows and doors needed for escape from a deadly fire. Make sure that windows are not stuck, screens can be taken out quickly and that security bars can be properly opened.

It is important that everyone in the family understands and practices how to properly operate locked or barred windows and doors. Windows should open easily and be wide enough to allow escape, and locked or barred doors should operate quickly and easily. The best escape plans have two ways to get out of each room. If the primary exit is blocked by fire or smoke, you will need a second way out. A secondary route might be a window onto an adjacent roof or an Underwriter's Laboratory (UL) approved collapsible ladder for escape from upper story windows.

3. Cover all exterior vents, attics and eaves with metal mesh screens no larger than 6 millimeters.

4. **Install multipane windows, tempered safety glass or fireproof shutters to protect large windows from radiant heat.**
5. **Use fire-resistant draperies for added window protection.**

PROTECTION FOR HEATING SOURCES

More than one-third of Americans uses fireplaces, wood stoves and other fuel-fired appliances as primary heat sources in their home. Unfortunately, many people are unaware of the fire risks when heating with wood and solid fuels.

Heating fire account for 36% of residential home fires in rural areas every year. Often these are due to creosote buildup in chimneys and stovepipes. All home heating systems require maintenance to function safely and efficiently.

Fireplaces and Wood Stoves

- Have your chimney or wood stove inspected and cleaned annually by a certified chimney specialist.
- Carefully follow the manufacturer's installation and maintenance instructions for a wood stove.
- Look for solid construction, such as plate steel or cast iron metal.
- Check for cracks and inspect legs, hinges, and door seals for smooth joints and seams.
- Clear the area around the hearth of debris, decorations and flammable materials.
- Always use a metal mesh screen with fireplaces. Leave glass doors open while burning a fire.
- Install stovepipe thermometers to help monitor flue temperatures.
- Keep air inlets on wood stoves open, and never restrict air supply to fireplaces. Otherwise you may cause creosote buildup that could lead to a chimney fire.
- Use fire-resistant materials on walls around wood stoves.
- Never use flammable liquids to start a fire.



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- Use only seasoned hardwood. Soft, moist wood accelerates creosote buildup.
- Build small fires that burn completely and produce less smoke.
- Never burn cardboard boxes, trash or debris in your fireplace or wood stove.
- When building a fire, place logs at the rear of the fireplace on an adequate supporting grate.
- Never leave a fire in the fireplace unattended. Extinguish the fire before going to bed or leaving the house.
- Soak hot ashes in water and place them in a metal container outside your home.

Electric Space Heaters

- Buy only heaters with the UL safety listing.
- Check to make sure it has a thermostat control mechanism, and will switch off automatically if the heater falls over.
- Don't dry clothes or store objects on top of your heater; heaters are not dryers or tables.
- Space heaters need space; keep combustibles at least 3 feet away from each heater.
- Always unplug your electric space heater when not in use.

Kerosene Heaters

- Buy only UL approved heaters and check with your local fire department on the legality of kerosene heaters in your community.
- Never fill your heater with gasoline or camp stove fuel; both flair-up easily. Only use crystal clear, K-1 kerosene. Never overfill any portable heater.
- Use the kerosene heater in a well-ventilated room.

PREVENTING ELECTRICAL FIRES

Electrical fires in our homes claim the lives of 200 Americans each year and injure 1,500 more. Some of these fires are caused by electrical system failures and appliance defects, but many more are caused by the misuse and poor maintenance of electrical appliances, incorrectly installed wiring, and overloaded circuits and extension cords.

December is the most dangerous month for electrical fires. Fire deaths are highest in winter months which call for more indoor activities and increases in lighting, heating, and appliance use. Most electrical wiring fires start in the bedroom.

Safety Precautions in Preventing Electrical Fires

- When using appliances, follow the manufacturer’s safety precautions. Overheating, unusual smells, shorts, sparks and sputters are all warning signs that appliances need to be shut off, then replaced or repaired. Have an electrician check the wiring in your house. Unplug appliances when not in use.
- ***Routinely check*** your electrical appliances and wiring.
- Never overload extension cords or wall sockets. Do not place cords and wires under rugs, over nails or in high traffic areas. Immediately shut off, then professionally replace, light switches that are hot to the touch and lights that flicker. Use safety closures to “child-proof” electrical outlets.
- Frayed wires can cause fires. Replace all worn, old, or damaged appliance cords immediately.
- Keep electrical appliances away from wet floors and counters; pay special care to electrical appliances in the bathroom and kitchen.
- When buying electrical appliances, look for products which meet the UL standard for safety.
- Don't allow children to play with or around electrical appliances like space heaters, irons and hair dryers.
- Do not trap electric cords against walls where heat can build up.
- Keep clothes, bedding, curtains and other potentially combustible items at least 3 feet from all heaters.

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- Only use lab-approved electric blankets and warmers. Check to make sure the cords are not frayed.
- If an appliance has a three-prong plug, use it only in a three-slot outlet. Never force it to fit into a two-slot outlet or extension cord.
- Check your electrical tools regularly for signs of wear. If the cords are frayed or cracked, replace them. Replace any tool if it causes even small electrical shocks, overheats, shorts out or gives off smoke or sparks.
- Replace mattresses made before the 1973 Federal Mattress Flammability Standard. Mattresses made since then are required by law to be safer.

PREVENTING FIRES DURING THE HOLIDAY SEASON



Each year fires associated with the holiday season injure 1,200 individuals and cause over \$25 million in damage.

1. **Holiday trees.** Special fire safety precautions need to be taken when keeping a live tree in the house. A burning tree can rapidly fill a room with fire and deadly gases.
 - *Selecting a tree.* Needles on fresh trees should be green and hard to pull back from the branches, and the needle should not break if the tree has been freshly cut. The trunk should be sticky to the touch. Old trees can be identified by bouncing the tree trunk on the ground. If many needles fall off, the tree has been cut too long, has probably dried out, and is a fire hazard.
 - *Caring for your tree.* Do not place your tree close to a heat source, including a fireplace or heat vent. The heat will dry out the tree, causing it to be more easily ignited by heat, flame or sparks. Be careful not to drop or flick cigarette ashes near a tree. Do not put your live tree up too early or leave it up for longer than two weeks. Keep the tree stand filled with water at all times.
 - *Disposing of your tree.* Never put tree branches or needles in a fireplace or woodburning stove. When the tree becomes dry, discard it promptly. The best way to dispose of your tree is by taking it to a recycling center or having it hauled away by a community pick-up service.

2. Holiday lights.

- *Maintain your holiday lights.* Inspect holiday lights each year for frayed wires, bare spots, gaps in the insulation, broken or cracked sockets and excessive kinking or wear before putting them up. Use only lighting listed by an approved testing laboratory.
- *Do not overload electrical outlets.* Do not link more than three light strands, unless the directions indicate it is safe. Connect strings of light to an extension cord before plugging the cord into the outlet. Make sure to periodically check the wires—they should not be warm to the touch.
- *Do not leave holiday lights unattended.*

3. Holiday decorations.

- *Use only nonflammable decorations.* All decorations should be nonflammable or flame-retardant and placed away from heat vents.
- *Never put wrapping paper in a fireplace.* It can throw off dangerous sparks and produce a chemical buildup in the home that could cause an explosion.
- *Artificial holiday trees.* If you are using a metallic or artificial tree, make sure it is flame retardant.

4. Candle Care.

- *Avoid using lit candles.* If you do use them, make sure they are in stable holders and place them where they cannot be easily knocked down. Never leave the house with candles burning.
- *Never put lit candles on a tree.* Do not go near a holiday tree with an open flame—candles, lighters or matches.
- *Have working smoke alarms.* As in every season, have working smoke alarms installed on every level of your home, test them monthly and keep them clean and equipped with fresh batteries at all times. Know when and how to call for help. And remember to practice your home escape plan.



PRECAUTIONARY MEASURES FOR OLDER AMERICANS

Every year more than 1,000 Americans over age 65 die in fires. People over the age of 80 die in fires at a rate three times higher than the rest of the population. Many of these fatalities occur where there is no working smoke detector. However, the following are a number of precautionary steps older Americans can take to dramatically reduce their chances of becoming a fire casualty.

1. ***Kitchen Fires.*** Cooking accidents are the leading cause of fire related injuries for older Americans. The kitchen is one of the most active and potentially dangerous rooms in the home. Most kitchen fires occur because food is left unattended on the stove or in the oven.
 - If you must leave the kitchen while cooking, turn off the burners and take a spoon or potholder with you to remind you to return to the kitchen.
 - Never cook with loose, dangling sleeves. Robes and other loose-fitting garments can ignite easily.
 - Grease is extremely flammable; keep all cooking surfaces clean. Heat cooking oils gradually and use extra caution when deep-frying. If a fire breaks out in a pan, put a lid on the pan. **Never throw water on a grease fire.**
 - Turn pot handles toward the side of the range, and always use a potholder when reaching for handles.
 - Never use a range or stove to heat your home.
2. ***Space Heaters.*** Heating equipment is responsible for a big share of fires in seniors' homes. Extra caution should be used with alternate heaters such as wood stoves or electric space heaters. Too often the heaters become a fire hazard, particularly when newspapers and other combustibles are nearby.
 - Buy only UL-approved heaters. Check your heaters often to make sure they are in good condition.
 - Burning fuel can produce deadly fumes; only use them in well-ventilated areas. Use only the manufacturer's recommended fuel for each heater.
 - Do not use electric space heaters in the bathroom or around other wet areas.

- Do not dry or store objects on top of your heater. Keep combustibles away from heat sources.
3. **Wiring.** Faulty wiring is another major cause of fires affecting the elderly. Older homes can have serious wiring problems, ranging from old appliances with bad wiring to overloaded sockets.
- Regularly inspect your extension cords for fraying, exposed wires or loose plugs. They are not intended for use as permanent wiring. Unplug them when not in use.
 - If you need to plug in two or three appliances, do not use a simple extension cord. It's better to get a UL-approved unit that has built-in circuit breakers.
 - Never run electric cords or extensions under rugs or in high traffic areas.
4. **Smoking.** The unsafe use of smoking materials is the leading cause of fire deaths among older Americans.
- Don't leave smoking materials unattended.
 - Don't put ashtrays on arms of sofas or chairs where they can be easily knocked over.
 - Use safety ashtrays with wide lips.
 - Empty all ashtrays into the toilet or a metal container every night before going to bed.
 - Never smoke in bed. Burning sheets and blankets may create a fire from which escape may be impossible.

Finally, having a working smoke detector dramatically increases your chances of surviving a fire. And remember to practice a home escape plan frequently with your family.

Unit 5: Protecting Your Home From Fire



Unit Review

Circle the correct response. Answers may be found on page A1.

1. A good protection measure against wildfires mentioned in this unit is _____.
 - a) planting shrubbery that will stop the spread of fire.
 - b) altering security bars on windows and doors so they don't trap you in a fire.
 - c) building you home close to a fire station to decrease emergency response time.

2. A combination of residential sprinklers and smoke detectors can save most potential victims of home fires except victims of:
 - a) clothing fires
 - b) explosions
 - c) flash floods
 - d) all of the above.

3. Which of the following is NOT considered fuel to an interface fire?
 - a) leaves and pine needles
 - b) rock garden
 - c) trees and grass
 - d) houses

4. One reason fires start more easily during the holiday season is:
 - a) Children are usually careless when disposing of gift boxes and wrapping paper.
 - b) Sometimes holiday trees are placed too close to heating sources such as a fireplace or vent and are easily ignited by the heat.
 - c) Because of kitchen accidents which occur more often due to the amount of cooking done during the holidays.

5. What is the **leading** cause of fire related injuries for older Americans?
 - a) space heaters
 - b) smoking
 - c) kitchen fires
 - d) candles usage

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6. An effective tool that creates defensible space between your home and flammable vegetation to protect against fires is known as _____.
 - a) fire-safe landscaping
 - b) fire walls
 - c) swimming pools

7. Which of the home heating sources below should homeowners take **extra** precaution in operating?
 - a) stove
 - b) electric space heater
 - c) electric blanket