

# **Module 2: Fire Safety**

## **Lesson 6: Fire Hazards in the Home and Workplace**

### **Self-Study Guide**

## Lesson Overview

**Lesson Purpose** This lesson focuses on mitigating fire hazards in the home and workplace.

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**Lesson Objectives** After completing this lesson, you should be able to:

- Identify potential fire hazards in your home and workplace.
- Determine steps that you can take to mitigate those hazards.

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**Estimated Time** 20 minutes

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**Contents** This lesson includes the following sections:

- Lesson Overview
  - Electrical Hazards
  - Natural Gas Hazards
  - Flammable Liquids
  - General Fire Prevention Strategies
  - Lesson Summary
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### Fire Hazard Mitigation

As in other areas of preparedness and response, CERT fire safety begins at home and in the workplace. Simple fire prevention measures will go far in reducing the likelihood of fires.

Fire prevention involves:

- Locating potential sources of ignition.
- Taking steps to eliminate or reduce the hazards.

### Potential Fire Hazards

Many potential fire hazards in the home and workplace fall into three categories:

- Electrical Hazards
- Natural Gas Hazards
- Flammable Liquids

We'll begin with Electrical Hazards beginning on the next page.

### Electrical Hazards

Electrical hazards are often caused by electrical overloads and faulty electrical appliances.

Examples of potential hazards include:

- Overloaded electrical outlets.
- "Daisy-chained" power strips (one plugged into another).
- Use of adapters to plug 3-prong cords into 2-prong outlets.
- Extension cords used as permanent wiring.
- Electrical cords under carpets or across high-traffic areas.
- Broken or frayed electrical cords.
- Electrical appliances left on (e.g., stove, oven, etc.).

### Activity: Identifying Electrical Hazards



**Instructions: Conduct a mental walkthrough of your home, room by room. Check off potential electrical hazards that could occur in each room.**

#### Which of these hazards could occur in your home?

- Overloaded electrical outlet
- Power strip without circuit breaker
- "Daisy-chained" power strips
- Heavy appliance (e.g., refrigerator, space heater) plugged into a power strip
- Use of adapter to plug 3-prong cord into 2-prong outlet
- Grounding prong removed from 3-prong extension cord
- Extension cord used as permanent wiring
- Light-duty extension cord used for heavy-duty purpose (e.g., power tool)
- Electrical cord under carpet or across high-traffic area
- Broken or frayed electrical cord
- Malfunctioning electrical appliance
- Appliances left on

You should repeat this activity for your workplace. When time permits, conduct actual room-by-room walkthroughs of your home and workplace and add to the lists as necessary.

### Mitigating Electrical Hazards

Mitigating electrical hazards involves eliminating potentially dangerous situations. The following are examples.

- Maintain electrical appliances properly. Repair or replace faulty appliances. Replace broken or frayed cords.
- Don't run electrical cords under carpets.
- Don't overload outlets.
- Use extension cords only for temporary purposes.

If you have too few outlets for your electrical needs, take the time to use them properly to avoid overloading. If you have other concerns about wiring, you may need an electrician to do a safety inspection and recommend improvements.

### Responding to an Electrical Emergency

Emergencies sometimes occur despite our best efforts. In the event of an electrical emergency, you may have to shut off electricity at the electrical box.

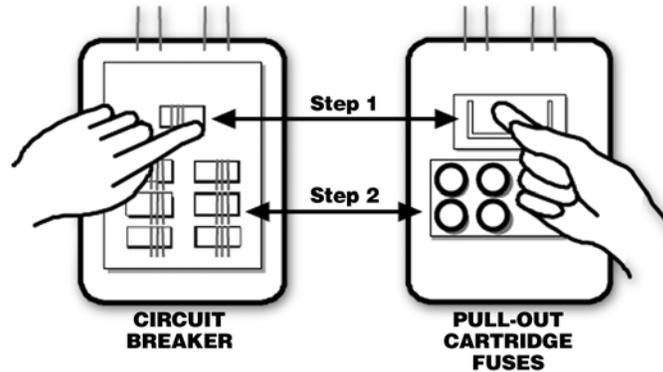
- Know where the main fuse or circuit breaker box is.
- Label power shutoffs for electrical appliances and different parts of your home so that you can turn off specific items or areas if necessary.
- If you must shut off power to the building, do so in the proper order (individual switches before the main switch).
- Never enter a flooded basement to shut off the electrical supply. Water conducts electricity!

### Electrical Shutoff Procedures

The illustration below shows both a circuit breaker box and a fuse box. Shut off electrical power in this order:

1. Turn off all individual breakers or unscrew all fuses.
2. Shut off the main circuit or the main fuse switch.

When you are certain that it is safe to turn the power back on, reverse the steps (main power first, then individual circuits).



### Natural Gas Hazards

Natural gas leaking into a home or workplace presents two types of hazards:

- Asphyxiant: Gas is an asphyxiant that robs the body of oxygen.
- Explosive: Gas is an explosive that can easily ignite.

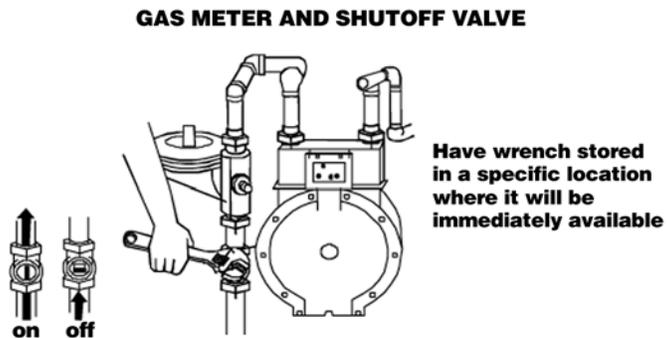
### Mitigating Natural Gas Hazards

You can take the following measures to reduce natural gas hazards:

- Install a natural gas detector near the furnace and hot water tank.
- Test the detector monthly to ensure that it works.
- Locate and label the gas shutoff valve(s). There may be multiple valves inside a home in addition to the main shutoff.
- Know how to shut off the gas, and keep a shutoff wrench nearby.

### Gas Shutoff Procedures

Use a wrench to turn the valve clockwise one-quarter turn.



### Responding to a Natural Gas Emergency

In a disaster, look for the following indicators of a natural gas problem:

- Odor of gas
- Natural gas detector indicates the presence of gas
- Indicator on the gas meter shows that gas is flowing

In these situations, do not use the phone, light switch, or anything that could ignite the gas. Turn off the meter from **outside of the building**.

Remember your safety and never enter the basement of a structure that is on fire to turn off any utility.

After service is turned off, it can be restored only by a trained technician.

### Flammable Liquid Hazards

Many common household and office products are flammable or combustible. Flammable liquids have a flashpoint below 100°F and burn easily at normal working temperatures. Combustible liquids have a flashpoint at or above 100°F and are less hazardous than flammable liquids but still pose a risk.

Flammable liquids can ignite with explosive force. The vapors—not the liquid itself—can be ignited by any open flame (a match, cigarette, or pilot light), a spark, or even static electricity. The volatility of these products requires special storage and handling.

### Examples of Flammable Household Products

For simplicity, we'll refer to flammable and combustible liquids simply as flammable liquids. All of these products require cautious storage and handling regardless of their flashpoint. Examples include:

- Gasoline.
- Kerosene.
- Oil.
- Charcoal lighter.
- Paint thinners and removers.
- Acetone.
- Spot removers, cleaning fluids.
- Solvents.
- Cleaning products.

Products packaged as aerosols (e.g., deodorants, hair sprays, insecticides, spray paint) can also pose a hazard if they become heated because they contain flammable propellants.

### Mitigating Flammable Liquid Hazards

To minimize hazards associated with flammable liquid products:

- Read labels to identify flammable products.
- Store them properly in approved safety containers, away from living areas.
- Use flammable liquids in a well-ventilated area.
- In case of fire, use a portable fire extinguisher rated for Class B fires.

### Storing Flammable Liquids

To ensure safe storage of flammable liquids, remember the acronym L.I.E.S.:

- Limit:** Limit the amount of flammable liquids in storage.
- Isolate:** Isolate products in approved containers stored in enclosed cabinets. Protect them from ignition sources. Don't store flammables in a mechanical room. Never bring gasoline indoors.
- Eliminate:** Eliminate products that are no longer necessary by disposing of them properly. Reduce fumes by practicing good housekeeping—wipe up spills immediately.
- Separate:** Separate incompatible materials (e.g., don't store flammables near corrosives).

**Activity: Fire Hazard Mitigation**



**Instructions: Complete this fire hazard mitigation checklist for your home. Select Yes or No to indicate whether each mitigation step has been completed.**

**Fire Hazard Mitigation Checklist**

	Yes	No
<b>Electrical Hazard Mitigation</b>		
Eliminate electrical outlet overloads.	<input type="checkbox"/>	<input type="checkbox"/>
Ensure that all power strips have circuit breakers.	<input type="checkbox"/>	<input type="checkbox"/>
Avoid using power strips or extension cords in series.	<input type="checkbox"/>	<input type="checkbox"/>
Plug heavy appliances directly into wall outlets (not power strips).	<input type="checkbox"/>	<input type="checkbox"/>
Eliminate 3-prong/2-prong adapters.	<input type="checkbox"/>	<input type="checkbox"/>
Replace long-term use of extension cords with permanent wiring.	<input type="checkbox"/>	<input type="checkbox"/>
Have a heavy-duty extension cord available for power tools.	<input type="checkbox"/>	<input type="checkbox"/>
Avoid electrical cords under carpets or across high-traffic areas.	<input type="checkbox"/>	<input type="checkbox"/>
Replace broken or frayed electrical cords.	<input type="checkbox"/>	<input type="checkbox"/>
Repair or replace faulty electrical appliances.	<input type="checkbox"/>	<input type="checkbox"/>
Know how and where to shut off electrical power.	<input type="checkbox"/>	<input type="checkbox"/>
Contact an electrician for electrical improvements (if needed).	<input type="checkbox"/>	<input type="checkbox"/>
Have a Class C or ABC fire extinguisher available.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Natural Gas Hazard Mitigation</b>		
Install a natural gas monitor.	<input type="checkbox"/>	<input type="checkbox"/>
Test monitor monthly.	<input type="checkbox"/>	<input type="checkbox"/>
Know how and where to shut off gas.	<input type="checkbox"/>	<input type="checkbox"/>
Label gas meter shutoff valves.	<input type="checkbox"/>	<input type="checkbox"/>
Store shutoff wrench near gas meter.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Flammable Liquid Mitigation</b>		
Identify flammable products (read labels).	<input type="checkbox"/>	<input type="checkbox"/>
Keep flammables in approved safety containers.	<input type="checkbox"/>	<input type="checkbox"/>
Use flammable liquids only in well-ventilated areas.	<input type="checkbox"/>	<input type="checkbox"/>
Store flammable liquids in a fireproof cabinet away from living areas.	<input type="checkbox"/>	<input type="checkbox"/>
Eliminate sources of ignition near flammables.	<input type="checkbox"/>	<input type="checkbox"/>
Reduce fumes by practicing wiping up spills immediately.	<input type="checkbox"/>	<input type="checkbox"/>
Separate incompatible materials (flammables and corrosives).	<input type="checkbox"/>	<input type="checkbox"/>
Have a Class B or ABC fire extinguisher available.	<input type="checkbox"/>	<input type="checkbox"/>

Eliminating fire hazards associated with electricity, natural gas, and flammable liquids will go a long way toward reducing your fire risk.

There are many other ways to improve fire safety in your home and workplace.

### General Fire Prevention Strategies

- Install smoke alarms on every level of the home and near all sleeping areas.
- Conduct a home hazard hunt. Many items and conditions around the home and workplace can present fire hazards. Taking time to look for and eliminate hazards will reduce the risk.
- Inspect wood stoves and chimneys annually. Burning wood leaves flammable creosote deposits in the firebox, flue, and chimney. These buildups must be removed professionally to minimize the risk of fire.
- Purchase heaters only if they have been laboratory tested and approved. Follow the manufacturer's directions for use. Plug heaters directly into a wall socket, and unplug them when they are not in use.
- Keep combustible materials away from heat sources, including stoves, heaters, candles, and fireplaces. Materials such as curtains, bedding, furniture, towels, clothing, bags, and boxes can catch fire quickly. Keep them at least 3 feet away.
- Keep matches and lighters away from children. Children are fascinated by fire and will play with matches and lighters if they are available.
- Never leave fire unattended. A controlled fire can quickly become uncontrolled. Never leave a candle, fireplace, or space heater unattended.

Knowledge Review



**Instructions:** Indicate whether the following practices are safe or unsafe practices. When you are finished, turn to the next page to check your answers.

Practice	Safe	Unsafe
Plug a refrigerator into a power strip.	<input type="checkbox"/>	<input type="checkbox"/>
Protect an extension cord from foot traffic by running it under a rug.	<input type="checkbox"/>	<input type="checkbox"/>
Plug a computer and printer into a power strip with circuit breaker.	<input type="checkbox"/>	<input type="checkbox"/>
Plug a power strip into a power strip.	<input type="checkbox"/>	<input type="checkbox"/>
Connect a bedside lamp to an outlet behind the dresser using an extension cord.	<input type="checkbox"/>	<input type="checkbox"/>
Turn off electricity by shutting off individual breakers first, then the main circuit.	<input type="checkbox"/>	<input type="checkbox"/>
Wearing rubber boots, wade through 2 inches of water to the electrical box.	<input type="checkbox"/>	<input type="checkbox"/>
Turn off gas at the outside meter if there are indications that gas is leaking.	<input type="checkbox"/>	<input type="checkbox"/>
Keep cleaning fluid in a closed cupboard.	<input type="checkbox"/>	<input type="checkbox"/>
Store gasoline in a closed cupboard in the basement.	<input type="checkbox"/>	<input type="checkbox"/>

Knowledge Review: Answer Key



**Instructions: Compare your answers to the correct ones shown below.**

**Practice**

	Safe	Unsafe
Plug a refrigerator into a power strip. Power strips are not designed for heavy appliances, which should be plugged directly into a wall outlet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Protect an extension cord from foot traffic by running it under a rug. Electrical cords should not be placed under a carpet or rug.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Plug a computer and printer into a power strip with circuit breaker. Power strips are appropriate for these types of equipment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Plug a power strip into a power strip. Never "daisy-chain" power strips!	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Connect a bedside lamp to an outlet behind the dresser using an extension cord. Extension cords are for temporary use only. They are not permanent wiring solutions.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Turn off electricity by shutting off individual breakers first, then the main circuit. Turning the gas off will help avoid secondary fires caused by gas leaks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wearing rubber boots, wade through 2 inches of water to the electrical box. Entering a flooded basement (even with rubber boots on) to turn off electricity would expose you to the risk of electrical shock.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Turn off gas at the outside meter if there are indications that gas is leaking. Turning the gas off will help avoid secondary fires caused by gas leaks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Keep cleaning fluid in a closed cupboard. A closed cupboard helps restrict fumes.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Store gasoline in a closed cupboard in the basement. Gasoline should not be stored inside the house.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Lesson Summary

### Lesson Summary

In this lesson you learned that:

- A CERT member's fire safety role begins at home and at the workplace.
- Electricity, natural gas, and flammable liquids can create fire hazards.
- Taking the time to look for and eliminate fire hazards will reduce the risk.

### Next Lesson

You have completed this lesson. You are now ready to begin Lesson 7: Safe Fire Suppression.