UNIT 2: FIRE SAFETY

In this unit you will learn about:

- **Fire Chemistry:** How fire occurs, classes of fire, and choosing the correct means to extinguish each type of fire.
- **Fire Hazards:** Potential fire hazards in the home and workplace, and fire prevention strategies.
- **Fire Safety:** How to evaluate fires, assess firefighting resources, and determine a course of action.
- **Portable Fire Extinguishers:** Types of portable fire extinguishers and how to operate them.
- **Fire Suppression Safety:** How to decide if you should attempt to extinguish a fire; how to approach and extinguish a fire safely.
- **Teamwork:** The importance of working with a buddy.
- **Hazardous Materials:** How to identify potentially dangerous materials in storage, in transit, and in your home.

UNIT 2: FIRE SAFETY

OBJECTIVES	At the conclusion of this unit, the participants should be able to: ▪ Explain the role of CERTs in fire safety. ▪ Identify and reduce potential fire risks in the home and workplace. ▪ Conduct a basic sizeup for a fire emergency. ▪ Operate a portable fire extinguisher correctly. ▪ Understand minimum safety precautions, including safety equipment, utility control, buddy system, and backup teams. ▪ Identify the locations of hazardous materials in the community and home, and reduce the risk from hazardous materials in the home.
SCOPE	The scope of this unit will include: ▪ Introduction and Unit Overview ▪ Fire Chemistry ▪ Reducing Fire Hazards in the Home and Workplace ▪ CERT Sizeup ▪ Firefighting Resources ▪ Fire Suppression Safety ▪ Exercise: Suppressing Small Fires ▪ Hazardous Materials ▪ Unit Summary
ESTIMATED COMPLETION TIME	2 hours 30 minutes
TRAINING METHODS	As an introduction to fire safety, the Instructor will describe fire chemistry and the classes of fire emphasizing the importance of selecting the correct methods or agent for fire safety. Then, the Instructor will present an overview of hazards in the home and workplace, including electrical hazards, natural gas hazards, and flammable and combustible liquids, and lead a discussion of hazard mitigation and preparedness. The Instructor will then describe CERT strategies for assessing situations involving fire using sizeup and explain how to use the sizeup checklist when conducting a sizeup.

TRAINING METHODS (CONTINUED)

The next topic will be a discussion of firefighting resources, including portable fire extinguishers and creative resources such as pools, dirt or sand, and a garden hose. Emphasis will be placed on portable fire extinguishers because they will be the most common resource available to CERTs. Discussion of portable fire extinguishers will include types, extinguisher components, deciding to use a fire extinguisher, and correct extinguisher operation.

Fire safety will be the next topic. The Instructor will introduce the use of fire safety equipment and will place special emphasis on firefighter safety rules, including using the buddy system and a backup team, and techniques for fighting fires (e.g., confine the fire, stay low to the ground, identify a second exit route, etc.).

Next, the Instructor will lead an interactive discussion of hazardous materials, including where they are found, placarding, storage, and defensive strategies for hazardous materials accidents.

Finally, the unit will end with an exercise in which the participants will operate in teams of two and use a portable fire extinguisher to extinguish a gas fire.

RESOURCES REQUIRED

- *Community Emergency Response Team* Instructor Guide
- *Community Emergency Response Team* Participant Manual
- Visuals 2.1 through 2.19

EQUIPMENT

In addition to the equipment listed at the front of this Instructor Guide, you will need the following equipment for this unit:

- A computer with PowerPoint software
- A computer projector and screen
- Samples of NFPA 704 Diamond and other hazardous materials placards, if possible
- 1 roll of cotton swabbing
- 1 Pyrex® jar with lid
- 1 box of wooden kitchen matches
- 1 water fire extinguisher
- 1 dry chemical fire extinguisher
- Portable Class A:B:C fire extinguishers (one for every five participants) (A:B:C extinguishers may also be used.)
- Fire Pan (see page 2-4)
- Road flares and a long pole

EQUIPMENT (CONTINUED)

If time permits, the video, *Fire Extinguishers: Fight or Flight,* is recommended for this unit. The video provides information on the basic elements of fire and shows how to use different types of extinguishers. The video is available through:

National Fire Protection Administration
1 Batterymarch Park
Quincy, MA 02269
800/344-3555

Also recommended is the video, *On Fire: A Family Guide to Fire Safety*, which contains useful footage on fire chemistry, flashover, the use of a fire extinguisher, and putting out kitchen fires. This video is available through:

KCET Video
4401 Sunset Boulevard
Los Angeles, CA 90027
800/343-4727

If using the video(s), the following additional equipment will be required:

- Videocassette player
- Monitor

NOTES

A suggested time plan for this unit is as follows:

Introduction and Unit Overview ..... 10 minutes
Fire Chemistry ..... 10 minutes
Reducing Fire Hazards in the Home and Workplace ..... 15 minutes
CERT Sizeup..... 5 minutes
Firefighting Resources ..... 25 minutes
Fire Suppression Safety ..... 10 minutes
Hazardous Materials ..... 10 minutes
Exercise: Suppressing Small Fires..... 60 minutes
Unit Summary..... 5 minutes

Total Time: 2 hours 30 minutes

NOTES

The construction for the fire pan is shown below.

UNIT 2: FIRE SAFETY

INTRODUCTION AND UNIT OVERVIEW

INTRODUCE UNIT

Introduce this unit by welcoming the participants to Unit 2 of the CERT training program.

Introduce any new instructors who will be assisting with this session.

Introduce fire safety by telling the participants that during and immediately following a severe emergency, the first priorities of professional fire services are life safety and extinguishing *major* fires. They may be hampered by impassable roads, inadequate water supply, weather conditions, burning material, and inadequate resources.

VISUAL 2.1

Introduction and Unit Overview

The role of CERTs in fire safety:

- Put out <u>small</u> fires.
- Prevent additional fires.
- Shutoff utilities.
- Assist with evacuations where necessary.

Visual 2.1

Emphasize that CERTs play a very important role in fire safety by:

- <u>Extinguishing small fires</u> before they become major fires. This unit will provide training on how to use an extinguisher to put out small fires—and how to recognize when a fire is too big to handle.
- <u>Preventing additional fires by removing fuel sources</u>. This unit will also describe how to ensure that a fire, once extinguished, is completely extinguished and stays extinguished.

INTRODUCTION AND UNIT OVERVIEW (CONTINUED)

- Shutting off utilities, when necessary and safe to do so.

- Assisting with evacuations where necessary. When a fire is beyond the ability of CERTs to extinguish, CERT members need to protect life safety by evacuating the area, when necessary, and establishing a perimeter.

INSTRUCTOR'S NOTE

Although CERTs assist with evacuations, the procedures for conducting evacuations are not covered in this course. It is recommended that evacuation be covered in supplemental training.

Stress the important role that CERTs play in neighborhood and workplace fire safety. CERT members help in fire-related emergencies when professional responders (paid and volunteer) are delayed. When responding, CERT members should keep in mind the following CERT standards:

- Rescuer safety is always the number one priority. Therefore, CERT members always:
  - Work with a buddy.
  - Wear safety equipment (gloves, helmet, goggles, mask, and boots).

- The CERT goal is to do the greatest good for the greatest number.

UNIT OBJECTIVES

VISUAL 2.2

Unit Objectives

- Explain the role of CERTs in fire safety.
- Identify and reduce potential fire risks in the home and workplace.
- Conduct a basic sizeup for a fire emergency.
- Understand basic safety precautions.
- Identify hazardous materials in the home and community.
- Extinguish small fires using a fire extinguisher.

Visual 2.2

INTRODUCTION AND UNIT OVERVIEW (CONTINUED)

Tell the participants that at the end of this unit, they should be able to:

- Explain the role that CERTs play in fire safety.
- Identify and reduce potential fire risks in the home and workplace.
- Conduct a basic sizeup for a fire emergency.
- Understand minimum safety precautions, including:
  - Safety equipment.
  - Utility control.
  - Buddy system.
  - Back-up teams.
- Identify locations of hazardous materials in the community and the home, and reduce the risk from hazardous materials in the home.
- Extinguish small fires using a fire extinguisher.

Preview the unit topics by telling the group that the unit will provide them with the knowledge and skills that they will need to reduce or eliminate fire hazards and extinguish small fires. The areas that they will learn about include:

- How fires start and what keeps them burning.
- Identification of fire hazards in the home, neighborhood, and workplace.
- How to conduct a fire assessment, or sizeup.
- The main firefighting resources that are available to CERTs and how to use them.
- Procedures for safe firefighting.
- Hazardous materials identification.

Tell the group that, at the end of the unit, they will have an opportunity to use a portable extinguisher to put out a fire.

FIRE CHEMISTRY

INSTRUCTOR'S NOTE

Show a video to demonstrate any of the points in the unit.

INTRODUCE TOPIC

Introduce this topic by asking the following question:

ASK QUESTION

Does anyone know what it takes for a fire to burn?

VISUAL 2.3

The Fire Triangle

- Heat
- Fuel
- Oxygen

Visual 2.3

If not mentioned by the participants, explain that fire requires three elements to exist:

- Heat: Heat is required to elevate the temperature of a material to its ignition point.
- Fuel: The fuel for a fire may be a solid, liquid, or gas. The type and quantity of the fuel will determine which method should be used to extinguish the fire.
- Oxygen: Most fires will burn vigorously in any atmosphere of at least 20 percent oxygen. Without oxygen, most fuels could be heated until entirely vaporized, yet would not burn.

FIRE CHEMISTRY (CONTINUED)

Explain that working together, these three elements, called the *fire triangle,* create a chemical exothermic reaction, which is fire.

PM, P. 2-3

Refer the participants to the *Fire Triangle* figure in the Participant Manual.

Stress that if <u>any</u> of these elements is missing or if any is taken away, fire will not occur or will extinguish.

Tell the group that you will now demonstrate the concept of the fire triangle by removing the oxygen from burning cotton.

INSTRUCTOR'S NOTE

Use the following steps to demonstrate the concept:

1. **Ignite a rolled-up piece of cotton, place it inside a Pyrex® jar, and cover it tightly.**
2. **Wait until the flame goes out.**
3. **Remove the material from the jar and blow on it to demonstrate that, unless the fire is completely out and overhauled, adding oxygen may complete the fire triangle and rekindle the fire.**

Emphasize the need to ensure that every piece of burning material is completely extinguished. Tell the participants to think of Smokey the Bear and campfires to remember this point.

VISUAL 2.4

Fire Chemistry

Classes of fire:

- A: Ordinary combustibles
- B: Flammable and combustible liquids
- C: Energized electrical equipment
- D: Combustible metals

Visual 2.4

	PM, P. 2-3	**Fire Triangle**

Fire Triangle: Fuel, oxygen, and heat create a chemical reaction, which causes fire.

FIRE CHEMISTRY (CONTINUED)

Tell the participants that, to aid in extinguishing fires, fires are categorized into classes based on the type of fuel that is burning:

- Class A Fires: Ordinary combustibles such as paper, cloth, wood, rubber, and many plastics.

FYI **INSTRUCTOR'S NOTE**

Reemphasize the need to overhaul Class A fires (i.e., ensure that every piece of burning material is completely extinguished).

- Class B Fires: Flammable liquids (e.g., oils, gasoline) and combustible liquids (e.g., charcoal lighter fluid, kerosene). These fuels burn only at the surface because oxygen cannot penetrate the depth of the fluid. Only the vapor burns when ignited.

- Class C Fires: Energized electrical equipment (e.g., wiring, motors). (When the electricity is turned off, the fire becomes a class A fire.)

- Class D Fires: Combustible metals (e.g., aluminum, magnesium, titanium).

Stress that it is extremely important to identify the type of fuel feeding the fire to select the correct method and agent for extinguishing the fire.

FYI **INSTRUCTOR'S NOTE**

Ask the group if anyone has any questions about fire chemistry.

Explain that the next part of the unit will deal with reducing fire hazards in the home and workplace.

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE

INTRODUCE TOPIC

Explain that this section will deal with identifying and preventing fire hazards in the home and workplace.

Introduce this topic by asking the following question:

ASK QUESTION

> **What are potential fire hazards in homes or workplaces?**

Allow the group time to respond. Provide suggestions of additional potential fire hazards.

Emphasize that part of CERT planning is to identify hazards in the area that would affect them in an emergency. This information is important to professional responders when they arrive on scene.

ASK QUESTION

> **What measures have you taken to mitigate or prevent the hazards?**

Use the participants' responses to make the following points:

- Each of us has some type of fire hazard in our home or workplace. Most of these hazards fall into three categories:
  - Electrical hazards
  - Natural gas hazards
  - Flammable or combustible liquids

Point out that homes and workplaces can and do have other hazards, including incompatible materials stored in close proximity to each other.

- Simple fire prevention measures will go far in reducing the likelihood of fires:
  - First, *locate* potential sources of ignition.
  - Then, do what you can to *reduce or eliminate* the hazards.

VISUAL 2.5

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE (CONTINUED)

ELECTRICAL HAZARDS

Reducing Fire Hazards in Home and Workplace

- Avoid the "electrical octopus."
- Don't run cords under carpets.
- Replace broken or frayed cords.
- Maintain appliances.

Visual 2.5

Provide the group with examples of common electrical hazards and simple ways that they can be reduced or eliminated:

- Avoid the "electrical octopus." Eliminate tangles of electrical cords. Don't overload electrical outlets. Don't plug power strips into other power strips.
- Don't run electrical cords under carpets.
- Replace broken or frayed cords immediately.
- Maintain electrical appliances properly. Repair or replace malfunctioning appliances.

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE (CONTINUED)

Point out that emergencies sometimes occur despite our best efforts. In the event of an electrical emergency:

- Know where the power shutoffs for electrical appliances are.
- Know where the power shutoff for circuit breakers or fuses is and how to shut off the power.
- Unscrew individual fuses or switch off smaller breakers first, then pull the main switch or breaker.
- When turning the power back on, turn on the main switch or breaker first, then screw in the fuses or switch on the smaller breakers.

Stress that the participants should not enter a flooded basement to shut off the electrical supply because water conducts electricity.

PM, P. 2-6

Refer the participants to the figures, *Circuit Box and Fuse Box* in the Participant Manual.

INSTRUCTOR'S NOTE

Check with a representative from the local utility company regarding local utility protocols, and convey these to the participants. If possible, develop training models of fuse and breaker boxes to allow demonstrations and hands-on practice. Depending on your location, you may also choose to cover propane gas shutoffs.

	PM, P. 2-6	Shutoffs

Circuit Box With Shutoff

Circuit box showing shutoff steps.
Step 1: Shut off individual breakers.
Step 2: Shut off main breaker.

Fuse Box With Shutoff

Fuse box showing shutoff steps.
Step 1: Pull out individual fuses.
Step 2: Pull out main fuse.

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE (CONTINUED)

NATURAL GAS HAZARDS

Explain that natural gas presents two types of hazards. It is an:

- Asphyxiant that robs the body of oxygen.
- Explosive that can easily ignite.

VISUAL 2.6

Reducing Fire Hazards in Home and Workplace

- Install a natural gas detector.
- Locate and label gas shutoffs.

Visual 2.6

Provide the participants with several examples for reducing 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 have the proper tool for shutting off the gas handy.

PM, P. 2-7

Refer the participants to the figure, *Natural Gas Meter with Shutoff* in the Participant Manual.

	PM, P. 2-7	**Natural Gas Meter with Shutoff**

The gas meter shut-off diagram indicates the shut-off valve location on the pipe that comes out of the ground. To turn off the valve, use a wrench to turn the valve clockwise one-quarter turn.

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE (CONTINUED)

Stress that in a disaster, if they smell gas, see the indicator on the meter showing gas is flowing, or if there is a fire, the participants should turn off the meter from outside the building. After service is turned off, however, it can be restored only by a trained technician.

INSTRUCTOR'S NOTE

Again, consult with a local utility representative to determine protocols and, if possible, create a model gas meter to demonstrate and allow practice with the procedure for shutting off the gas.

Warn the participants never to enter the basement of a structure that is on fire to turn off any utility.

FLAMMABLE LIQUID HAZARDS

VISUAL 2.7

Reducing Fire Hazards in Home and Workplace

- Read labels.
- Use L.I.E.S storage procedures (Limit, Isolate, Eliminate, Separate).

Visual 2.7

Provide several examples for reducing hazards from flammable liquids:

- Read labels to identify flammable products.
- Store them properly, using the L.I.E.S. method covered in Unit 1.

REDUCING FIRE HAZARDS IN THE HOME AND WORKPLACE (CONTINUED)

Tell the group that they should extinguish a flammable liquid using a portable fire extinguisher rated for that class of fire. Explain that ratings for portable extinguishers will be addressed later in this unit.

FYI

INSTRUCTOR'S NOTE

Provide the group with information about safe disposal of hazardous materials in your area.

CERT SIZEUP

INTRODUCE TOPIC

Introduce this topic by explaining to the group that CERT sizeup is a continual data-gathering process that will dictate whether to attempt fire suppression and planning for extinguishing the fire.

VISUAL 2.8

CERT Sizeup

Answer these questions:

- Can my buddy and I fight the fire safely?
- Do we have the right equipment?
- Are there other hazards?
- Is the building structurally damaged?
- Can we escape?

Visual 2.8

Tell the group that CERT sizeup answers the questions:

- Can my buddy and I fight the fire safely?
- Do my buddy and I have the right equipment?
- Are there other hazards?
- Is the building structurally damaged?
- Can my buddy and I escape?

INSTRUCTOR'S NOTE

If you feel it would be appropriate, you may simplify the sizeup process below to convey just the major elements. Sizeup will be covered in detail again in Unit 5: Light Search and Rescue Operations.

Point out that sizeup is a continual nine-step process that enables first responders to make decisions and respond appropriately in the areas of greatest need.

VISUAL 2.9

CERT SIZEUP (CONTINUED)

CERT Sizeup

1. Gather Facts.
2. Assess Damage.
3. Consider Probabilities.
4. Assess Your Situation.
5. Establish Priorities.
6. Make Decisions.
7. Develop Plans of Action.
8. Take Action.
9. Evaluate Progress.

Visual 2.9

Explain that the nine steps in sizeup are:

1. Gather facts. What has happened? How many people are involved (if you know)? What is the current situation?

2. Assess and communicate the damage. Take a lap around the building. Try to determine what has happened, what is happening now, and how bad things can really get.

3. Consider probabilities. What is likely to happen? What could happen through cascading events?

4. Assess your own situation. Are you in immediate danger? Have you been trained to handle the situation? Do you have the equipment that you need?

5. Establish priorities. Are lives at risk? Can you help? Remember, life safety is the first priority!

6. Make decisions. Base your decisions on the answers to Steps 1 through 3 and in accordance with the priorities that you established.

7. Develop plans of action. Develop a plan that will help you accomplish your priorities. Simple plans may be verbal, but more complex plans should always be written.

CERT SIZEUP (CONTINUED)

8. Take action. Execute your plan, documenting deviations and status changes so that you can report the situation accurately to first responders.

9. Evaluate progress. At intervals, evaluate your progress in accomplishing the objectives in the plan of action to determine what is working and what changes you may have to make to stabilize the situation.

FYI **INSTRUCTOR'S NOTE**

Point out that while sizeup is a fire department term, the process has been tailored for CERTs and will be used again in other areas of CERT responsibility. Provide several examples to illustrate the differences between fire department sizeup and CERT sizeup.

PM, PP. 2-11 THROUGH 2-15

Refer the participants to the *CERT Sizeup Checklist* in the Participant Manual. Point out that, although the checklist is not inclusive, it does include many of the questions that CERT members should ask when sizing up a fire situation. Review the checklist with the group.

FYI **INSTRUCTOR'S NOTE**

Ask the group if anyone has any questions about CERT sizeup.

Explain that after sizing up the situation, the next step is to identify the resources that are possible for fire suppression.

	PM, P. 2-11	**CERT Fire Sizeup Checklist**

	Yes	No
Step 1: Gather Facts		
Time		
▪ Does the time of day or week impact fire suppression efforts?	☐	☐
How?		
Weather		
▪ Will weather conditions impact your safety?	☐	☐
If yes, how will your safety be affected?		
▪ Will weather conditions affect the fire situation?	☐	☐
If yes, how will the fire situation be affected?		
Type Of Construction		
▪ What type(s) of structure(s) are involved?		
▪ What type(s) of construction are involved?		

	PM, P. 2-12	**CERT Fire Sizeup Checklist**

	Yes	No
Step 1: Gather Facts (Continued)		
Occupancy		
▪ Are the structures occupied?	☐	☐
If yes, how many people are likely to be affected?		
▪ Are there special considerations (e.g. children, elderly)?	☐	☐
Hazards		
▪ Are hazardous materials involved?	☐	☐
▪ Are any other types of hazards likely to be involved?	☐	☐
If yes, what other hazards?		
Step 2: Assess and Communicate the Damage		
▪ Take a lap around the building. Is the damage beyond the CERT team's capability?	☐	☐
▪ Are normal communication channels functioning?	☐	☐

	PM, P. 2-13	**CERT Fire Sizeup Checklist**

	Yes	No
Step 3: Consider Probabilities		
Life Hazards		
▪ Are there potentially life-threatening hazards?	☐	☐
If yes, what are the hazards?		
Path of Fire		
▪ Does the fire's path jeopardize other areas?	☐	☐
If yes, what other areas may be jeopardized?		
Additional Damage		
▪ Is there a high potential for more disaster activity that will impact personal safety?	☐	☐
If yes, what are the known risks?		

Step 4: Assess Your Own Situation

- What resources are available with which you can suppress the fire?

- What equipment is available?

	PM, P. 2-14	**CERT Fire Sizeup Checklist**

	Yes	No
Step 5: Establish Priorities		
▪ Can fire suppression be *safely* attempted by CERT members? <u>If no, do *not* attempt suppression.</u>	☐	☐
▪ Are there other, more pressing needs at the moment? If yes, list.	☐	☐
Step 6: Make Decisions		
▪ Where will deployment of available resources do the most good while maintaining an adequate margin of safety?		
Step 7: Develop a Plan of Action		
▪ Determine how personnel and other resources should be deployed.		

	PM, P. 2-15	**CERT Fire Sizeup Checklist**

Step 8: Take Action

- Put the plans into effect.

Step 9: Evaluate Progress

- Continually size up the situation to identify changes in the:
  - Scope of the problem.
  - Safety risks.
  - Resource availability.
- Adjust strategies as required.

FIREFIGHTING RESOURCES

INTRODUCE TOPIC

Introduce this topic by asking the participants what comes to mind when they think about firefighting resources.

VISUAL 2.10

Firefighting Resources

Resources available:

- Portable fire extinguishers
- Wet standpipes
- Confinement
- "Creative" resources

Visual 2.10

If not mentioned, tell the group that the most common firefighting resources are:

- Portable fire extinguishers.
- Interior wet standpipes.

Remind the participants that portable fire extinguishers are invaluable for putting out small fires. A well-prepared home or workplace will have at least two portable fire extinguishers.

INSTRUCTOR'S NOTE

If the participants are from neighborhood CERTs, do <u>not</u> provide training on wet standpipes.

Explain that interior wet standpipes are usually in commercial and apartment buildings and consist of 100 feet of 1½-inch jacketed hose with a $^{3}/_{8}$-inch nozzle tip. They deliver up to 125 gallons of water per minute.

Caution the group always to work in three-person teams when using an interior wet standpipe. One person handles the hose, another bleeds the air from the line, and the third person controls the water pressure.

FIREFIGHTING RESOURCES (CONTINUED)

INSTRUCTOR'S NOTE

If the participants might be expected to use a wet standpipe in a disaster situation, it is recommended that they be given practice in the use of one during the training.

Point out that there are also other firefighting resources available that are less common:

- In interior spaces, it is possible to *confine* a fire and restrict the spread of smoke and heat by closing doors to rooms and hallways.

- Other *creative* resources may also be available:

  - Swimming pool or spa water and buckets
  - Sand or dirt and shovels
  - A garden hose

Emphasize that the type of fuel that is burning will determine which resources to select to fight a fire.

Add that, because portable fire extinguishers are most common, this section will focus on them.

EXTINGUISHER RATING AND LABELING

Tell the group that portable fire extinguishers must be rated and approved by the State Fire Marshal and Underwriters Laboratories. They are rated according to their effectiveness on the different classes of fire. Their strength and capability must also be labeled by the manufacturer.

Explain that the label contains vital information about the type(s) of fire for which the extinguisher is appropriate.

PM, P. 2-17

Refer the participants to the *Manufacturer's Label* illustration in the Participant Manual.

	PM, P. 2-17	**Manufacturer's Label**

UNDERWRITERS LABORATORIES INC. ®

DRY CHEMICAL FIRE EXTINGUISHER
CLASSIFICATION 3A:40B:C
TESTED IN ACCORDANCE WITH
ANSI/UL 711 AND ANSI/UL 299

NO.

MARINE TYPE U.S.C.G. TYPE A SIZE II TYPE B:C SIZE I
U.S.C.G. APPROVAL NO. 162.028/EX-2480
VALID ONLY WITH BRACKET NO. A-6

Sample Manufacturer's Label for a fire extinguisher, showing the Underwriters Laboratories Symbol at the top, the type and classification of fire extinguisher, testing procedures used, and serial number. At the bottom of the label is marine information, including the U.S. Coast Guard approval number.

FIREFIGHTING RESOURCES (CONTINUED)

TYPES OF FIRE EXTINGUISHERS

ASK QUESTION

Who can name the types of portable fire extinguishers?

VISUAL 2.11

Types of Fire Extinguishers

- Water
- Dry chemical
- Carbon dioxide
- Specialized fire extinguishers

Visual 2.11

If not mentioned, tell the group that there are four types of extinguishers:

- Water
- Dry chemical
- Carbon dioxide
- Specialized fire extinguishers

PM, P. 2-18

Explain that the next section will briefly describe the characteristics of each type of fire extinguisher. Refer the participants to the *Fire Types, Extinguishing Agents, and Methods* chart in the Participant Manual for an overview of this information.

Review the types of fires and extinguishing methods with the group.

	PM, P. 2-18	**Fire Types, Extinguishing Agents, and Methods**

Fire Type	Extinguishing	
	Agent	**Method**
Ordinary Solid Materials A	Water	Removes heat
	Foam	Removes air and heat
	Dry chemical	Breaks chain reaction
Flammable Liquids B	Foam CO_2	Removes air
	Dry chemical	Breaks chain reaction
Electrical Equipment C	CO_2	Removes air
	Dry chemical	Breaks chain reaction
Combustible Metals D	Special agents	Usually remove air

FIREFIGHTING RESOURCES (CONTINUED)

INSTRUCTOR'S NOTE

Display a water extinguisher.

Tell the group that common characteristics of water extinguishers include:

- Capacity. Standard size is 2½ gallons.
- Range. Standard range is 30-40 feet.
- Pressure. Standard pressure is 110 pounds per square inch (psi).

Warn the group to use extreme caution when using a water extinguisher to ensure that the water, which is under pressure, does not scatter lightweight materials and spread the fire.

INSTRUCTOR'S NOTE

Display a dry chemical extinguisher.

Tell the participants that dry chemical extinguishers are also common.

- Dry chemical extinguishers have a sodium bicarbonate base and are effective on Class B and C fires.
- Multipurpose dry chemical extinguishers have a monoammonium phosphate base and are effective for Class A, B, and C fires.

Common characteristics of dry chemical extinguishers include:

- Capacity. Approximately 10-20 seconds discharge time.
- Range. Standard range is 8-12 feet.
- Pressure. Standard pressure is 175-250 psi.

Explain that, while still in use, carbon dioxide and other specialized extinguishers are becoming less common.

FIREFIGHTING RESOURCES (CONTINUED)

DECIDING TO USE A FIRE EXTINGUISHER

Tell the participants that there are a series of questions that they should ask themselves before attempting to fight a fire with a fire extinguisher.

Stress that if the participants answer "NO" to <u>any</u> of these questions, they should:

- Leave the building immediately.
- Shut all doors as they leave to slow the spread of the fire.

Tell the participants that if they answer "YES" to <u>all</u> of these questions, they may attempt to extinguish the fire. Emphasize that even if they answer "YES" to all of the questions, but feel unable to extinguish the fire, they should leave immediately.

PM, P. 2-20

Refer the group to the chart, titled *Deciding to Use a Fire Extinguisher*, in the Participant Manual, and review the decisions with the group:

- Can I escape quickly and safely from the area if I attempt to extinguish the fire? (The first priority for you and your buddy is safety.)
- Do I have the right type of extinguisher?
- Is the extinguisher large enough for the fire?
- Is the area free from other dangers, such as hazardous materials and falling debris?

	PM, P. 2-20	**Fire Types, Extinguishing Agents, and Methods**

A flowchart illustrates the decisionmaking process for determining whether to use a fire extinguisher. The decision is based on four questions:

- **Can I escape quickly and safely if I attempt to extinguish the fire?**
- **Do I have the right type of extinguisher?**
- **Is the extinguisher large enough for the fire?**
- **Is the area free from other dangers such as hazardous materials and fallen debris?**

If the answer to <u>all</u> questions are "yes," CERT members should attempt to extinguish the fire. If the answer to <u>any</u> questions are "no," CERT members should leave.

FIREFIGHTING RESOURCES (CONTINUED)

INSTRUCTOR'S NOTE

Ask the participants if they have any questions about how to use this decisionmaking guide.

OPERATING A FIRE EXTINGUISHER

Introduce the operation of a fire extinguisher by asking the following question.

ASK QUESTION

How many of you have had to operate a portable fire extinguisher?

After a show of hands, ask a few participants to share their results. Use their comments to elaborate on the topic.

INSTRUCTOR'S NOTE

Demonstrate using a portable extinguisher.

PM, P. 2-21

Refer the participants to the diagram titled, *Components of a Portable Fire Extinguisher,* in the Participant Manual. Explain that a portable fire extinguisher includes four components:

- A pressure gauge
- A hose
- A cylinder
- A carrying handle with trigger

	PM, P. 2-21	**Components of a Portable Fire Extinguisher**

Components of a portable fire extinguisher: Hose, carrying handle and trigger, pressure gauge, cylinder

FIREFIGHTING RESOURCES (CONTINUED)

Tell the group that they should always operate portable fire extinguishers in an upright position.

VISUAL 2.12

P.A.S.S.

- Pull
- Aim
- Squeeze
- Sweep

Test the extinguisher before approaching any fire.

Visual 2.12

Explain that the acronym for operating a fire extinguisher is P.A.S.S.:

- Pull
- Aim
- Squeeze
- Sweep

To ensure that the extinguisher is working properly, test it before approaching any fire.

INSTRUCTOR'S NOTE

Demonstrate P.A.S.S. during the explanation.

PM, P. 2-22

Refer the participants to the *PASS* diagram in the Participant Manual.

Emphasize the need to aim at the base of the fire, and explain that each participant will have the opportunity to practice this technique near the end of the session.

	PM, P. 2-22	P.A.S.S.

PASS: Pull, Aim, Squeeze, Sweep

FIREFIGHTING RESOURCES (CONTINUED)

INSTRUCTOR'S NOTE

Ask if anyone has any questions about portable fire extinguishers or their operation.

Explain that the next section will cover the safety rules to follow when suppressing fires.

FIRE SUPPRESSION SAFETY

INTRODUCE TOPIC

Introduce this topic by reminding the participants that, as CERT members, fire suppression will be one of their roles. Emphasize however, that—even following a disaster—their personal safety must be their number one concern. Stress that they will be unable to help anyone if they are injured through careless sizeup or unsafe acts.

PM, P. 2-22 & 2-23

Refer the group to the list of *Fire Suppression Safety Rules* in the Participant Manual.

	PM, PP. 2-22 & 2-23	**Fire Suppression Safety Rules**

Fire suppression safety rules include:

- Use safety equipment at all times. Wear your helmet, goggles, dust mask, leather gloves, and heavy shoes. If you are not equipped to protect your personal safety, leave the building.
- Work with a buddy. Buddies serve an important purpose. They protect your safety. Don't ever try to fight a fire alone.
- Have a backup team, whenever possible. A backup team just makes good sense. A backup team can support your fire suppression efforts and can provide help if you need it.
- Always have two ways to exit the fire area. Fires spread much faster than you might think. Always have a backup escape plan in case your main escape route becomes blocked.
- Feel closed doors with the back of the hand, working from the bottom of the door up. Do not touch the door handle before feeling the door. If the door is hot, there is fire behind it. Do not enter! Opening the door will feed additional oxygen to the fire.
- Confine the fire, whenever possible, by keeping doors closed.
- Stay low to the ground. Smoke will naturally rise. Keeping low to the ground will provide you with fresher air to breathe.
- Maintain a safe distance. Remember the effective range of your fire extinguisher. Don't get closer than necessary to extinguish the fire.
- Overhaul the fire to be sure that it is extinguished—and stays extinguished.

What CERTs don't do when suppressing fires is as important as what they should do. DON'T:

- Get too close. Stay near the outer range of your extinguisher. If you feel the heat, you are too close.
- Try to fight a fire alone. Remember that your first priority is your personal safety. Don't put yourself at risk.
- Try to suppress large fires. Learn the capability of your equipment, and do not try to suppress a fire that is clearly too large for the equipment at hand (i.e., a fire that is larger than the combined ratings of available fire extinguishers).
- Enter smoke-filled areas. Fire suppression in smoke-filled areas requires equipment that CERTs don't have.

VISUAL 2.13

FIRE SUPPRESSION SAFETY (CONTINUED)

Fire Suppression Safety

Do:

- Use safety equipment.
- Work in a buddy system.
- Have a backup team.
- Have two ways to exit.
- Maintain a safe distance.
- Overhaul the fire.

Visual 2.13

Stress the importance of following all fire suppression safety rules.

- Use safety equipment at all times. Wear your helmet, goggles, dust mask, leather gloves, and heavy shoes. If you are not equipped to protect your personal safety, leave the building.

- Work with a buddy. Buddies serve an important purpose. They protect your safety. Don't ever try to fight a fire alone.

- Have a backup team, whenever possible. A backup team just makes good sense. A backup team can support your fire suppression efforts and can provide help if you need it.

- Always have two ways to exit the fire area. Fires spread much faster than you might think. Always have a backup escape plan in case your main escape route becomes blocked.

- Feel closed doors with the back of the hand, working from the bottom of the door up. Do not touch the door handle before feeling the door. If the door is hot, there is fire behind it. Do not enter! Opening the door will feed additional oxygen to the fire.

FIRE SUPPRESSION SAFETY (CONTINUED)

- Confine the fire, whenever possible, by keeping doors closed.
- Stay low to the ground. Smoke will naturally rise. Keeping low to the ground will provide you with fresher air to breathe.
- Maintain a safe distance. Remember the effective range of your fire extinguisher. Don't get closer than necessary to extinguish the fire.
- Overhaul the fire to be sure that it is extinguished–and stays extinguished.

INSTRUCTOR'S NOTE

Briefly explain the overhaul process.

VISUAL 2.14

Fire Suppression Safety

DON'T:

- Try to suppress large fires.
- Get too close.
- Fight it alone.
- Enter smoke-filled areas.

Visual 2.14

Stress that what CERTs don't do when suppressing fires is as important as what they should do. DON'T:

- Get too close. Stay near the outer range of your extinguisher. If you feel the heat, you are too close.
- Try to fight a fire alone. Remember that your first priority is your personal safety. Don't put it at risk.
- Try to suppress large fires. Learn the capability of your equipment, and do not try to suppress a fire that is clearly too large for the equipment at hand (i.e., a fire that is larger than the combined ratings of available fire extinguishers).

FIRE SUPPRESSION SAFETY (CONTINUED)

- Enter smoke-filled areas. Suppressing fires in smoke-filled areas requires equipment that CERTs don't have.

Explain that portable extinguishers are rated for the size of fire that they can handle. This rating is expressed as a number from 1 to 40 for Class A extinguishers and from 1 to 640 for Class B extinguishers. This rating will appear on the label–2A:10B:C, for example. The larger the numbers, the larger the fire of a specific class on which the extinguisher can be used. (Note that higher-rated models are often heavier. Make sure you can hold and operate an extinguisher before you buy it.)

No number accompanies an extinguisher rated Class C. The C on the label indicates only that the extinguisher is safe to use on electrical fires.

Extinguishers for Class D fires must match the type of metal that is burning. These extinguishers also do not use numerical ratings. Extinguishers for Class D fires are labeled with a list detailing the metals that match the unit's extinguishing agent.

FYI

INSTRUCTOR'S NOTES

For planning purposes, explain that a small fire:

- **Is about the size of a wastepaper can.**
- **Can be extinguished with one fire extinguisher.**

Remind the group of the earlier demonstration (using burning cotton in the Pyrex® jar) to stress the need for overhauling.

Ask the group if anyone has any questions about fire suppression safety.

Tell the group that, next, they are going to learn about identifying hazardous materials.

HAZARDOUS MATERIALS

INTRODUCE TOPIC

Introduce this topic by asking the question below.

ASK QUESTION

> **How do you know if a material is hazardous?**

Allow the group time to respond.

VISUAL 2.15

> **Hazardous Materials . . .**
>
> - Corrode other materials
> - Explode or are easily ignited
> - React strongly with water
> - Are unstable when exposed to heat or shock
> - Are toxic to humans, animals, or the environment
>
> Visual 2.15

Explain that materials are considered hazardous if they have <u>any</u> of the characteristics listed on the visual:

- Corrode other materials.
- Explode or are easily ignited.
- React strongly with water.
- Are unstable when exposed to heat or shock.
- Are otherwise toxic to humans, animals, or the environment.

HAZARDOUS MATERIALS (CONTINUED)

Explain that hazardous materials include, but are not limited to:

- Explosives.
- Flammable gases and liquids.
- Poisons and poisonous gases.
- Corrosives.
- Nonflammable gases.
- Oxidizers.
- Radioactive materials.

ASK QUESTION

Why is it important to know if hazardous materials are present?

Acknowledge the participants' responses. If not mentioned by the group, explain that knowledge that hazardous materials are present helps to protect CERT members' safety and is valuable sizeup information for first responders.

Emphasize that hazardous materials pose an ever-present danger. They are stored in all types of locations and are transported by a variety of means.

HAZARDOUS MATERIALS (CONTINUED)

IDENTIFYING STORED HAZARDOUS MATERIALS

VISUAL 2.16

Identifying Stored Hazardous Materials

NFPA 704 Diamond

Visual 2.16

ASK QUESTION

Has anyone ever seen the symbol in the visual or one similar to it? Does anyone know what it is or what it means?

If not mentioned by the group, explain that the placard is an NFPA 704 Diamond—the identification system instituted by the National Fire Protection Association. The NFPA 704 Diamond is a concise system for identifying the hazards associated with specific materials. This placard would be found on a fixed facility.

Tell the participants that the diamond is divided into four colored quadrants, each with a rating number inside of it, and that the number indicates the degree of risk associated with the material. **The higher the number the higher the risk!**

Explain that:

- The red quadrant describes the material's flammability.
- The blue quadrant indicates health hazard.
- The yellow quadrant indicates reactivity.

VISUAL 2.17

HAZARDOUS MATERIALS (CONTINUED)

Identifying Stored Hazardous Materials

NFPA 704 Diamond–White Quadrant:

~~W~~ Shows unusual reactivity with water

OX Possesses oxidizing properties

Visual 2.17

Point out that the white quadrant indicates special precautions. There are two symbols specified in the National Fire Codes, section 704.

- ~~W~~ indicates a material that shows unusual reactivity with water (i.e., should never be mixed with water or have water sprayed on it). Magnesium metal is an example of a material that is reactive to water.
- OX indicates a material that possesses oxidizing properties. Ammonium nitrate is an example of a material with oxidizing properties.

Even though the above symbols are specified under the National Fire Codes, some NFPA 704 Diamonds use additional symbols:

- ACID indicates that the material is an acid.
- ALK indicates that the material is a base.
- COR indicates that the material is corrosive.
- indicates that the material is radioactive.

HAZARDOUS MATERIALS (CONTINUED)

Stress that the numbers within the NFPA 704 Diamond are for professional firefighter use only. CERT members should consider these placards a "stop sign." The only action CERT members should take when a facility is placarded with an NFPA 704 Diamond is to evacuate persons who are downwind, as necessary, to an uphill and upwind location.

INSTRUCTOR'S NOTE

Mention or use slides to illustrate local transportation hazards and any facilities that use the NFPA 704 Diamond, to provide more relevance to the discussion.

If possible, show the group an actual 704 placard to improve recognition.

IDENTIFYING HAZARDOUS MATERIALS IN TRANSIT

VISUAL 2.18

Identifying Hazardous Materials in Transit

DOT Placards

Visual 2.18

ASK QUESTION

Does anyone recognize the placards in the visual?

HAZARDOUS MATERIALS (CONTINUED)

If not mentioned by the group, explain that they are Department of Transportation (DOT) placards. Explain that the DOT placard is one of three ways that hazardous materials are marked and identified while in transit. The other two ways are:

- The United Nations (UN) system.
- The North American (NA) warning placards.

FYI **INSTRUCTOR'S NOTE**

The NA placarding system is being phased out but is still occasionally used, usually on hazardous materials being transported from Canada.

Point out that these placards can be on any vehicle, not only tankers. Also, emphasize that:

- No placard is required for less than 1,000 pounds of many hazardous materials.
- Certain hazardous materials (e.g., anhydrous ammonia) are placarded as a nonflammable gas for domestic transport but as a flammable gas for international transport. (Anhydrous ammonia is a flammable gas!)
- Sometimes drivers forget to change the placard when they change their cargo. The group should use extreme caution when approaching any vehicle in an accident.

FYI **INSTRUCTOR'S NOTE**

If anyone asks, hazardous materials that require placarding in any quantity include poisonous gases that present an inhalation hazard (DOT Class 2.3), poisonous liquids that present an inhalation hazard (DOT Class 6.1), and radioactive materials (DOT Class 7).

HAZARDOUS MATERIALS (CONTINUED)

PM, P. 2-27

Explain that the DOT placard color is also significant. Refer the participants to the *DOT Placard Warning* illustrations in the Participant Manual.

INSTRUCTOR'S NOTE

If possible, show the participants actual DOT placards to improve recognition.

VISUAL 2.19

Identifying Hazardous Materials in Transit

UN AND NA Placards

Visual 2.19

Tell the group that this visual shows examples of the UN and NA systems. The UN and NA systems are displayed mainly on tank cars, cargo tanks, rail cars, and portable tanks.

Stress that the participants should always err on the side of safety. They should *not* assume that, because there is no placard, no hazardous materials are present. Suggest that the participants:

- Talk to drivers or train crew members whenever possible.
- Treat any unknown situation as a hazardous materials incident.

Emphasize that, like the NFPA 704 Diamond, the DOT, UN, and NA placards should be a "stop sign" for CERT members.

INSTRUCTOR'S NOTE

Ask the group if anyone has any questions about hazardous materials or how they are identified in storage or transport.

EXERCISE: SUPPRESSING SMALL FIRES

CONDUCT EXERCISE

Purpose: This exercise will provide the participants with experience in two key areas of fire suppression:

- Using a portable fire extinguisher to suppress a small fire.
- Applying teamwork to fire suppression.

Ensure that all of the participants are dressed properly and wear safety equipment for this exercise. Dress for this exercise may be casual. However, shorts and open-toed shoes should not be permitted.

PREPARE FOR EXERCISE

Prepare a propane gas fire source outside in an area with at least 40 feet of open space upwind of the fire source. Provide Class A:B:C portable extinguishers. (Most fire extinguisher service companies will provide extinguishers for this purpose if acknowledged. Contact local companies for support.)

This exercise requires two instructors: Instructor 1 will lead the exercise. Instructor 2 will observe and serve as the exercise Safety Officer.

INSTRUCTOR'S NOTE

> **It is advisable to demonstrate critical steps (e.g., the "ready" position) before allowing the participants to complete this exercise.**

Instructions: Follow the steps below to conduct this exercise. **Coach the participants through the exercise using the instructions shown in bold type.**

1. Assign the participants to two-person teams. Stress that participants must communicate with each other. The emphasis is on safety and teamwork.
2. Taking one team at a time, provide each team member with a portable fire extinguisher.
3. Instructor 2 will light the fire, using a road flare mounted on a long pole, when Instructor 1 indicates that the participants are ready to begin the exercise.

EXERCISE: SUPPRESSING SMALL FIRES (CONTINUED)

4. Before allowing the participants to begin this exercise, Instructor 1 should ask them:

   - What their exit routes are.
   - From which direction the wind is blowing.
   - Whether the fire is spreading and where it would be in the next 30 seconds.

5. Ask Participant 1 to assume the "ready" position, with pin pulled, extinguisher aimed and upright, approximately 20 to 25 feet from the fire.

   When ready to approach the fire, Participant 1 should say, "Ready." Participant 2 should repeat, "Ready."

   As Participant 1 begins to move forward, he or she should say, "Going in." Participant 2 should repeat the command and stay within reach of Participant 1.

6. Ask Participant 2 to act as backup, assuming the "ready" position at an arm's distance from Participant 1.

7. Position Instructor 1 between the participants and the fire at all times.

   Both team members should walk toward the fire. Team Member 1 should watch the fire and Team Member 2 should stay close to Team Member 1, keeping his or her hand on Team Member 1's shoulder. Team Member 2's job is to protect Team Member 1.

EXERCISE: SUPPRESSING SMALL FIRES (CONTINUED)

8. Ask Participant 1 to approach the fire from the windward side (i.e., with the wind to the participant's back). When approximately 10 feet from the fire, Participant 1 should begin to discharge the extinguisher at the base of the fire, continuing the approach until the range for the extinguisher is optimal.

9. Participant 1 should sweep the base of the fire until it is extinguished.

   When Participant 1 is exiting the fire area, he or she should say, "Backing out." Participant 2 should repeat the command. Participant 2 should guide Participant 1 from the area with his or her hands as Participant 1 continues facing the fire and looking for other hazards.

After the fire is extinguished, ask the participants to trade positions and repeat the exercise. If time permits, allow each participant to use the extinguisher twice, to provide added practice.

Repeat this exercise with the other teams until all participants have had the opportunity to extinguish the fire.

SUMMARIZE KEY POINTS

UNIT SUMMARY

Summarize the key points of this unit:

Effective fire suppression depends on an understanding of:

- The type of fuel involved.
- The elements required for fire to exist.
- The class of fire.
- The resources required and available to extinguish each type of fire.
- Effective fire suppression techniques.

Fire requires heat, fuel, and oxygen to exist.

There are four types, or classes, of fire:

- Class A: Ordinary combustibles
- Class B: Flammable liquids
- Class C: Energized electrical equipment
- Class D: Combustible metals

It is extremely important to identify the class of fire to select the proper extinguisher for the class.

To help understand the types of materials, there are several methods of placarding hazardous materials being stored or transported, including NFPA, DOT, UN, and NA. When faced with accidents involving materials that are placarded as hazardous—or when the material is unknown—keep away and call for professional help immediately.

Portable fire extinguishers are most frequently used for suppressing small fires. Their labels tell the types of fires for which they are effective and the area that they can suppress.

When using portable fire extinguishers, remember P.A.S.S.: Pull, Aim, Squeeze, and Sweep.

UNIT SUMMARY (CONTINUED)

When suppressing a fire, always follow the safety rules established for CERTs.

HOMEWORK ASSIGNMENT

Remind the participants that, before the next session, they should:

- Read and familiarize themselves with Unit 3: Emergency Medical Operations—Part I in the Participant Manual.

- Obtain and bring to the session:

  - 1 box of 4" × 4" bandages.
  - 1 triangular bandage.
  - 1 roll of roller gauze.
  - 1 medical mask.
  - 1 pair of examination gloves.
  - 1 blanket.

Ask the participants to wear comfortable clothes for the next session because they will be practicing medical techniques.

Thank the participants for attending the session. Remind them of the date and time for the next session if necessary.