

PUBLIC EDUCATION 1

STUDENT MANUAL

Accredited by



CALIFORNIA STATE FIRE MARSHAL

California Fire Service
Training and Education System

DECEMBER 1989

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Published by

CALIFORNIA STATE FIRE MARSHAL
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C F S T E S

The California Fire Service Training and Education System (CFSTES) was established to provide a single statewide focus for Fire Service Training in California. CFSTES is a composite of all the elements that contribute to the development, delivery and administration of training for the California Fire Service. The authority for the central coordination of this effort is vested in the Training Division of the California State Fire Marshal's Office with oversight provided by the State Board of Fire Services.

The role of CFSTES is one of facilitating, coordinating and assisting in the development and implementation of standards and certification for the California Fire Service. CFSTES manages the California Fire Academy System by providing standardized curriculum and tests, accredited courses leading to certification, approved standardized training programs for local and regional delivery; administering the certification system; and publishing Career Development Guides, Instructors Guides, Student Manuals and other related support materials.

This system is as successful and effective as the people involved in it. It is a fire service system developed by the fire service, for the fire service . . . and we believe it is the best one in the country.

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A C K N O W L E D G E M E N T S

The material contained in this guide has been developed by the Training Division of the California State Fire Marshal's Office and approved by the State Board of Fire Services for fire service personnel and for personnel in related occupations who are pursuing one or more of the certification programs.

JAMES F. McMULLEN, Chief
California State Fire Marshal

KEN WAGNER
Division Chief, Training

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I N T R O D U C T I O N

This publication is intended to serve as a Student Manual. The material contained in the manual is based on the performance goals identified in the appropriate Career Development Guide, reviewed by a curriculum work group and then adopted by the State Board of Fire Services. The purpose of the Student Manual is to provide the same basic information to all students as an aid in standardizing the curriculum.

The manual has been designed to include essential student notes and information sheets that contain subject matter related to specific topics within the curriculum. Assignment sheets are also included in the manual that provide both individual and group activities allowing the students to benefit from direct application of the new skills and knowledge received during the course.

Each page within the Student Manual is identified in the upper left corner with either of two headings (Student Notes or Student Info) that denote the function of the material contained on the page.

STUDENT NOTES

Material on these pages is considered as essential information for use by the students and appears in the manual in the form of either "fill-in" or "completed" notes.

STUDENT INFO

Material on these pages contains information related to specific topics within the curriculum in the form of either Information Sheets, Assignment Sheets, charts or forms.

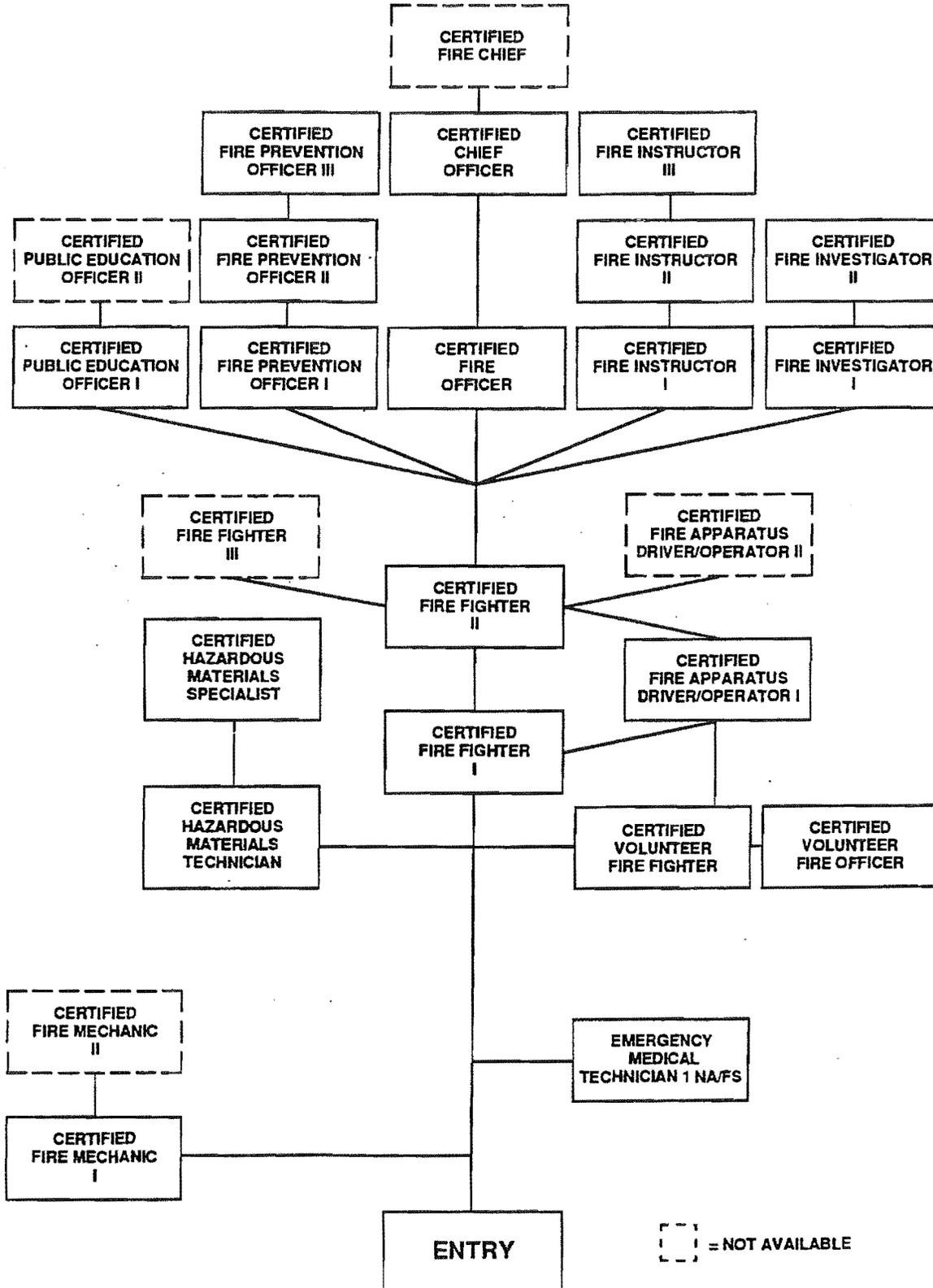
The notes and information are organized by lesson topic so that students can return to their department with a notebook to use and share with fellow fire personnel. These materials can be used to supplement company training or serve as a reference resource.



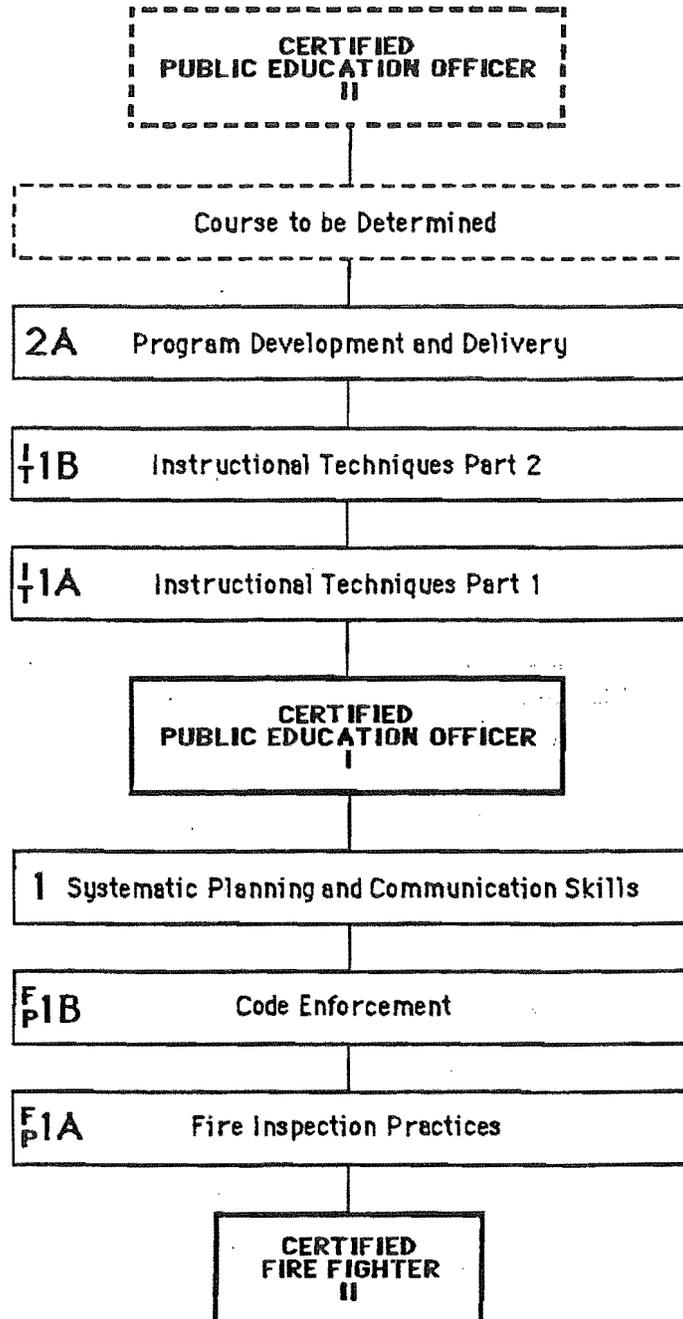
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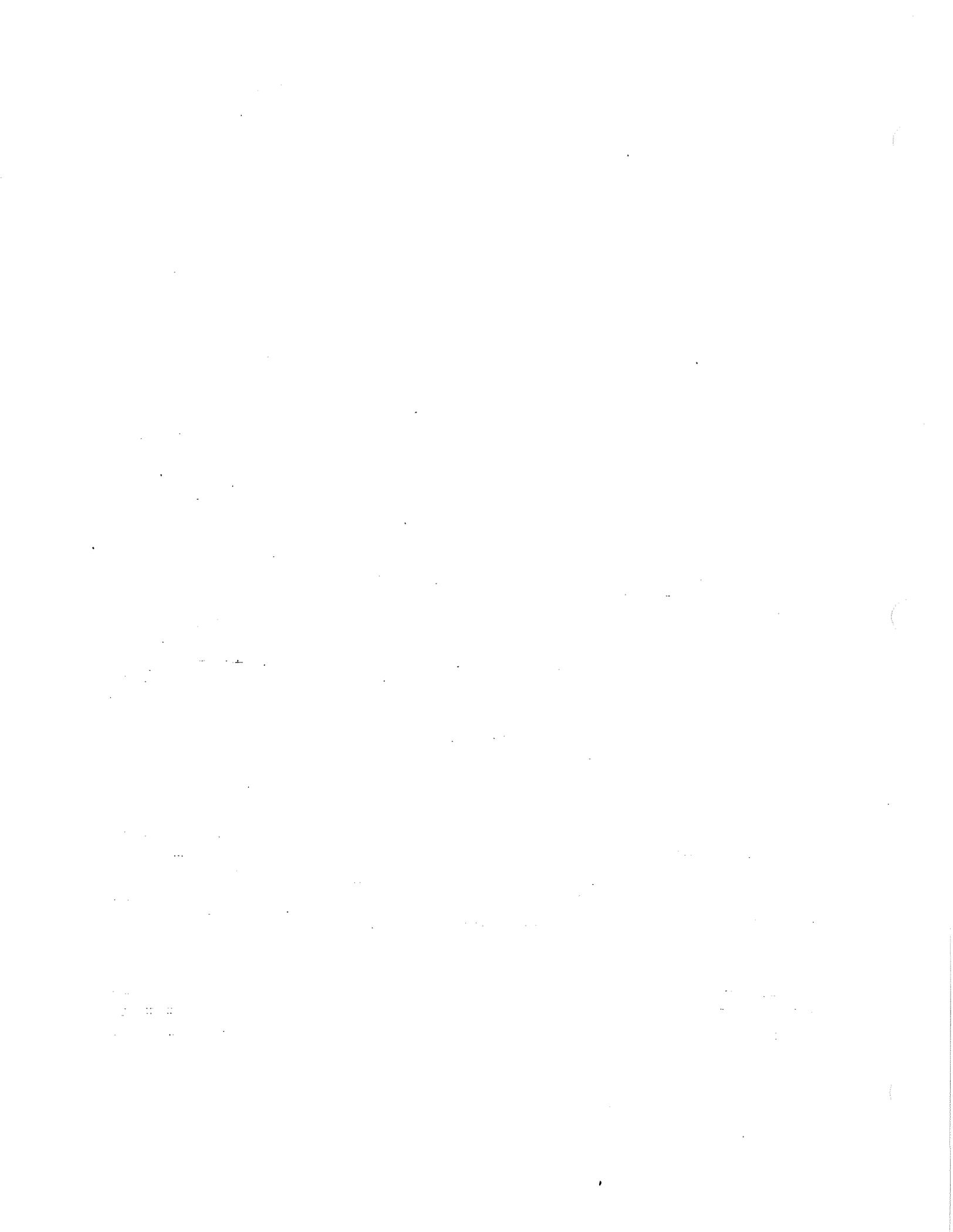


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PUBLIC EDUCATION OFFICER





PUBLIC EDUCATION OFFICER I

(a) PROGRAM OVERVIEW

Public Education Officer I is designed for those individuals directly involved in the planning and delivery of fire safety and fire prevention programs to the public. It is the first of two levels of certification for Public Education Officers.

Three courses comprise the educational requirements:

Fire Prevention 1A	- Fire Inspection Practices
Fire Prevention 1B	- Code Enforcement
Public Education 1	- Systematic Planning and Communication Skills

(1) PURPOSE AND GOALS

- (A) To set minimum performance standards for Public Education Officer I.
- (B) To identify the tasks a candidate must perform to obtain certification as a Public Education Officer I.
- (C) To establish a standard curriculum of public education officer courses for California fire service training programs.
- (D) To provide the means for maintaining a record of training accomplishments.
- (E) To correlate SBFS certification standards with state and national certification program standards.

Certification in California exceeds the requirements as identified in the National Professional Qualifications Board Standards.
- (F) To have all fire fighters in California become certified to an appropriate level.

(2) TRAINING GUIDES AND RESOURCES

- (A) Public Education Officer I (under development) and Fire Prevention Officer I Career Development Guides provide an analysis of each task contained in the Public Education Officer I Program. This guide lists a performance standard for each task listed and an applicable reference source.
- (B) An Instructor Guide for each course providing the instructor with lesson plans and objectives for all tasks included in the Public Education Officer I curriculum.
- (C) A Student Manual for each course.
- (D) A Certification Exam for each course.

(b) CERTIFICATION GUIDELINES

TO BECOME CERTIFIED:

(1) INSTRUCTION

- (A) Participants shall, through an Accredited Instructor, complete the training as specified in each of the three Instructor Guides.
- (B) See Section 23.00 for requirements on Accredited Instructors.
- (C) Successfully complete, with a 70% score, the certification exams for each of the three courses as proctored by the Accredited Instructor.

(2) PREREQUISITE

- (A) 1. Certified Fire Fighter II. Appointed to the rank of officer waives this prerequisite.
[If meeting Prerequisite (2)(A)1, applicant must comply with Experience (3)(A)1]
- or -
- 2. Completion of 30 semester units from an accredited college, of which 15 units must be from the Uniform Fire Technology or Fire Science curricula.
[If meeting Prerequisite (2)(A)2, applicant must comply with Experience (3)(A)2]

(3) EXPERIENCE

- (A) Have completed a minimum of 2 years experience as a full-time, paid fire fighter in a California fire department and 1 year paid occupational experience as a Public Education Officer. *[See Prerequisite (2)(A)1]*
- or -
Have completed a minimum of 3 years experience as a full-time, paid Public Education Officer for a California fire department. *[See Prerequisite (2)(A)2]*

(4) APPLICATION

Application for certification and payment of the certification fee may be made at any time. Applicants will be obligated to meet only those requirements in effect at the time of payment. To complete the application for certification, the following must be submitted to CFSTES:

- (A) An application form or written request for certification as a Public Education Officer I.
- (B) Copies of the completion certificates for each of the three courses.
- (C) Copy of Fire Fighter II certificate or verification of officer rank by the Fire Chief and written on department letterhead [if meeting Prerequisite (2)(A)].
- (D) Copies of college transcripts [if meeting Prerequisite (2)(B)].
- (E) Verification of the experience requirement signed by the Fire Chief and written on department letterhead.
- (F) The certification fee.

(5) EVALUATION

- (A) CFSTES scores the certification exam and mails notification of results to the participant after each course. A minimum of 70% score is required to receive certification credit.
- (B) Those passing the certification exam will receive a course certificate with their exam results.

Those failing the certification exam may retake the exam one time after 30 days from the original test date at no additional charge.

Those participants failing the certification exam both times must repeat the course.

PUBLIC FIRE EDUCATION - What is it?

PUBLIC FIRE EDUCATION - Who needs it?

PUBLIC FIRE EDUCATION - What do people need to know?

PUBLIC FIRE EDUCATION - Whose responsibility is it?

REDUCING FIRE DEATHS THROUGH PUBLIC FIRE EDUCATION

Back in the early 1970's when "America Burning" was published by the National Fire Prevention and Control Administration, it was noted that over 12,000 Americans were dying each year as a result of fires. At that time, it was stated that public fire education could impact these statistics and should be addressed on a National level. Over the past ten years there has been a growing emphasis upon public fire education. When current statistics showing just under 6,000 dying each year, what do you think we have learned?

We have learned that people are dying by ones and twos in single family dwellings. Large hotel and high-rise fires receive the press coverage, but it is the loss of life in homes that needs our attention. We know that the greatest number of multiple death fires occur between the hours of midnight and 4:00 a.m. We know that the victims are the very young and the very old. These are people who physically cannot get out in the event of a fire, or who are too young to know the proper responses to a threatening situation. We also know that people are dying from common errors, and omissions and misuse of smoking materials. People are dying not from the fire itself, but from smoke inhalation resulting from cigarettes smoldering for hours in overstuffed furniture.

We have the finest fire fighters in the world. We have the finest fire equipment in the world. We also have the worst fire record of any industrialized nation in the world.

FIRE DRILLS

Fire drills are for everyone - young and old - and should be practiced at home, at school, at work - everywhere. Let fire prevention week launch your regular fire drill schedule.

AT HOME

Everyone needs E.D.I.T.H., an exit drill in the home. Make a plan to be sure that everyone knows two ways out of every room in your home. Have a meeting place outside so that you can account for everyone's safe exit. As you develop your plan, remember that small children and disabled family members will need special assistance in their escape. Older family members may also need special assistance. Anyone

needing special assistance should sleep on the first floor or near an exit. Small children's bedrooms should be near an able-bodied adult. Consider the following procedure when conducting an exit drill in the home:

- o Each member of the family should be able to recognize the sound of the smoke detector or other fire alarm signal.
- o Conduct a fire drill periodically.
- o A designated adult should push the smoke detector test button or sound another agreed-upon alarm.
- o Family members should escape using the exit plan and immediately go outside to the prearranged meeting place.
- o Check to make sure that everyone has evacuated safely.
- o Everyone should re-enter the home and discuss any problems or questions that occurred during the drill.

Fire drills are not just for single-family homes. Multiple-family dwellings should also conduct fire drills. Work with your landlord, building attendant, other tenants or condominium association to schedule a fire drill. Discuss the evacuation procedure before conducting the drill and plan for the unexpected in case you are unable to exit your apartment.

- o Close the room door to keep back smoke.
- o Cover air vents where smoke may be seeping through, stuff any cracks with towels or sheets to keep the smoke out.
- o If possible, stay in a room with a window to the outside.
- o Use a towel or sheet to signal at the window to the rescuers.
- o If there is a phone in the room, call the fire department - even if fire fighters are already on the scene - to give your exact location.

- o In a smoke-filled room, try opening a window to see if the open window will improve the smoke situation. If the situation worsens with the window open, close it immediately.
- o Stay low to breathe cleaner air which will be near the floor.

AT SCHOOL

Practice makes perfect! Fire drills are a serious matter and should be practiced just as students may practice for a football game or rehearse a play.

- o On the first day of school, teachers should tell their students what the alarm sounds like and how to get outside.
- o Teachers should discuss what students should do in unusual situations. For example, students need to know what to do if they are alone in the media center or in the bathroom when the fire alarm sounds.

By knowing what to do ahead of time, students will respond to even unusual situations correctly.

AT WORK

No matter where you work, be prepared to evacuate in case of fire emergency. Employees need to know the emergency alarm sound and how to leave the work area and exit the building. During an emergency in a multi-storied building, use stairwells to exit, rather than the elevator. An elevator may stop between floors, or go to the fire floor and stop with the doors open.

- o Supervisors are responsible for briefing their employees on evacuation procedures for the building.
- o Supervisors and employees should also discuss plans for the unexpected, such as what to do if an employee is in a different area of the building when the alarm sounds.
- o Everyone should pre-plan how to exit from all areas of the building.

Ask your supervisor about evacuation procedures whenever you start a new job and tell new employees about evacuation procedures on their first day at work. Supervisors should show new employees how to report a fire and how to escape. Conduct fire drills on a regular basis. Supervisors should account for their employees once outside the building to ensure 100% participation in the drill.

EVERYWHERE

Always know two ways out, wherever you are. When visiting another home or in a restaurant, theater, or other public building, identify your first way out and a second way out to use if the primary exit is impassable. Insist that your entire family know two ways out of wherever they are. Make it a game. When you sit down at a restaurant, quiz each other about the location of exits.

YOU CAN LEARN NOT TO BURN BY REMEMBERING TO:

- o Stop, drop and roll to smother the flames if your clothes catch fire.
- o Install and maintain smoke detectors on each level or floor of your home and outside each sleeping area. Test the detector according to manufacturers directions and replace weak batteries right away.
- o Crawl low on your hands and knees to exit the building if you are caught in a smoke-filled room or building. The cleaner air is closer to the ground.
- o Conduct fire drills often. Once outside the building, STAY OUT. Go to the meeting place outside to account for everyone's safe evacuation. Remember Fire Drills Save Lives!

WHAT IT MEANS TO COMMUNICATE

In order to teach fire safety education, a public educator must learn to communicate with their audience. What does it mean to communicate? Below are three definitions of the term:

- o "A process by which information is exchanged between individuals through a common system or symbols, signs, or information."
- o "To transmit information, thought, or feeling so that it is satisfactorily received or understood."
- o "To communicate is to make known."

It follows that a failure to communicate is to:

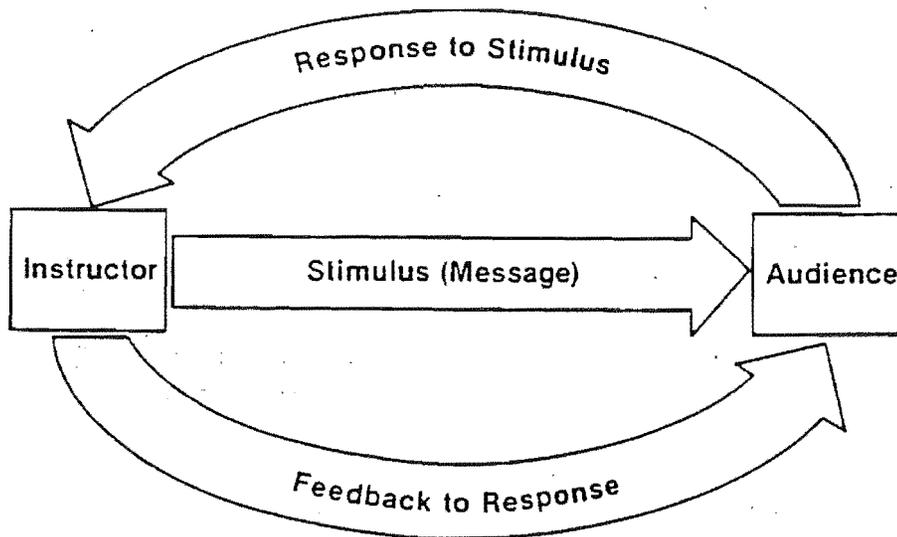
- o Fail to exchange information.
- o Transmit false or negative information, thoughts, or feelings.
- o Obscure, hide or conceal.

Communication is a very valuable tool for the public educator. Every individual possesses the ability to communicate. An individual is often able to communicate in a different way to different people in order to get a message across. In addition to being a flexible tool, communication is also a powerful tool that must be used wisely. People often take what is said very seriously and change a belief or behavior based on what they have learned. For this reason educators must choose their words and actions carefully to get their message out, and good communication is the essential element to accomplish this.

When choosing methods of communication for public education, it is important to understand a little bit about how people learn. It has been shown that we learn 10% of what we read, 20% of what is heard, 30% of what is seen, 50% of what is both seen and heard, 70% of what we say, and 90% of what we say while we are doing. It can be concluded that maximum behavior change and learning will take place if a person actually performs a behavior they are being taught and says out loud what they are doing. While this may not always be possible, an educator can try to maximize the learning process through the appropriate use of audio visual materials, brochures, and demonstrations.

EDUCATIONAL LOOP COMPONENTS

Another important part of the learning process is something called the "educational loop." The educational loop has three components: stimulus, response, and feedback. The stimulus is the message, or the actual presentation of information. The response is the audience reaction to what they are told or shown as a stimulus. The feedback comes from the instructor after the response has been evaluated. If the response is accurate, the instructor can reinforce the audience's behavior. If the response is incorrect, then the instructor must present the stimulus again, perhaps in a different way, until the response is correct. An educator must be careful not to neglect any portion of the educational loop since each step must be completed in order to determine if the information is being received properly.



Education is a communication process, so lessons must be designed with the communications loop in mind. There must be a message, a presentation of the information. This is the stimulus. The audience must react to that message so that the instructor can see that the students have correctly received it. This is the response. After the audience has responded, the instructor must decide on the correctness of the response and either reinforce it, or correct it. This is feedback.

The educational designer has many options available when deciding on the stimulus, response, and feedback methods. The problem is simply deciding which one is the most appropriate for the audience and behaviors, as well as the most economical.

THE STIMULUS

The stimulus or message can be presented several different ways. While there are two basic types of presentations, there are many mixtures of the two.

Verbal stimuli present the information in either written or auditory form, and use language as a medium. Examples of this form of presentation include a lecture, a pamphlet, an audio cassette, a small group discussion, or role-playing.

Visual stimuli are presented with diagrams, transparencies, graphics, or models.

Many times, of course, visual and verbal are combined, and we have a lecture with diagrams, or pamphlets with graphics, or motion pictures with sight and sound. One of the considerations in deciding on visual stimuli is the addition of motion and color. If a task involves motion, or if color is an important factor in the response, these must be considered as well. Obviously motion pictures, video tapes, and demonstrations do precisely that.

The decision on what type and what combination of stimuli to use must be based on the subject and audience, as well as the practicality of the materials. This would include (1) the time involved in the preparation, and the time the stimulus needs to present the materials; (2) the cost of the materials and their durability; and (3) the quality of the production (clarity, appeal, layout). Along with this the problem of logistics such as storage and transportation must be considered.

THE RESPONSE

After deciding on the method of presentation, the designer must decide on the method of response by the audience. They can respond orally, in writing, or by performing an action. Again, the designer must take into consideration the practicality of the method of response, and the ease of the response. In some settings, such as a large group, it may not be possible for everyone to respond one at a time. If that is the case, the designer must take this into consideration and sign a method of response suitable to that audience.

THE FEEDBACK

When the instructor performs feedback, the response must first be evaluated. Then the instructor either corrects it by re-presenting the information, or reinforces it if it is correct. Once again, the problem of audience size and behavior selection must be considered.

QUESTIONING TECHNIQUES

One way to ensure that information is being received is to use questions to the audience as part of your presentation. Questions not only provide you, as an instructor, feedback, but they can be used to introduce new points and enrich or liven up your programs. Questions that you ask the audience are referred to as speaker initiated. There are four basic types of speaker initiated questions:

- o Overhead questions - put out to the entire group; usually as a general question.
- o Direct questions - asked of a specific person.
- o Rhetorical questions - don't really require or desire an answer. They are used to stimulate thought.
- o Relay questions - send a question from the audience back to the audience. Use know-it-all students to the best advantage with these types of questions. For example, a teacher may respond to a student question by saying, "Good question, Joe. Can anybody else answer this question for him?"

Another type of question is that which comes from the audience, referred to as audience initiated questions. A few general guidelines for conducting question/answer session:

- o Be sure to leave at least a couple of minutes at the end of a program for questions. You may have neglected to cover a major point that is of importance to the particular audience.

- o Encourage questions with both your body language and tone of voice. If you start walking away and then ask for questions, you probably won't get any.

- o Answer questions briefly and directly. Don't give more information than the person was looking for. If you don't know the answer, say so directly rather than beating around the bush to cover up that you don't know. The audience will respect this more and you can always offer to find out and contact them later if they really want an answer to their question.

THE DO'S AND DON'TS OF QUESTION AND ANSWER SESSIONS

Question & Answer sessions are one of the most productive and dynamic parts of any presentation - whether it be one-on-one, small group, sales meeting, or a large public speech. Dynamic because of the immediate interaction and involvement. BUT the other side of the coin is Question & Answer sessions can be volatile, since you can't predict the audience. Thus, the need for guidelines - THE DO'S AND DON'TS.

DO: Encourage questions by leaning forward with your arm raised.

DON'T: Step back, cover yourself with your arms.

DO: Prime the pump if necessary.

DON'T: Plant "shills" with questions.

DO: Listen to the questioner... Look at the questioner.

DON'T: Look away... Interrupt... Show annoyance.

DO: Use the Question!

DON'T: Be evasive.

DO: Answer the audience. THIS IS THE MOST IMPORTANT "DO"

DON'T: Finish up by looking at the questioner.

DO: Be brief and to the point.

DON'T: Get caught up in a lengthy tangent.

DO: Pause with a tough question... Look at the individual while you think of the proper answer.

DON'T: Let your eyes dart around or repeat the question.

DO: Keep listening up to one minute.

DON'T: Shortchange the questioners.

DO: Treat Question & Answer session as "teamwork".

DON'T: Argue.

DO: Have a 2nd closing, after Question & Answer in a public presentation, and

DO: WATCH THE TIME

ORAL COMMUNICATION

Public speaking is a vital part of any public educator's job. This is however, one of man's greatest fears. In fact, a study conducted in 1973 showed that 41% of Americans fear public speaking more than anything. Only 19% of the people name death as their greatest fear. So you are not alone if you dread public speaking - obviously some literally consider it a fate worse than death!

It should come as some comfort to you that most of your fears can be greatly minimized by learning all you can about public speaking, paying attention to the details of preparation for a program, and practicing your programs. The fear that then remains is a common trait among even the most accomplished speakers and can be used to get you "up" for a program.

Public speaking is not that very much different from the everyday conversation that we participate in throughout our lives. It requires a slightly different method of delivery, a more structured presentation, and slightly more formal language, but the basics were learned many years ago when you were a child.

There are several factors that must be considered prior to your presentation. The first of these is to know your audience! Factors to consider about your audience include:

- o Average age of the group
- o Sex of the audience - male, female, or mixed
- o Size of the group
- o Religion
- o Racial, ethnic, or cultural background
- o Group membership or commonality (e.g. homeowners association, Rotary Club, etc.)
- o The audience's reason for being there - required or voluntary
- o The audience's interest in the topic
- o If the meeting is a special occasion for the group
- o The time of day you will be speaking

As a public speaker you must adapt your presentation to meet the needs of each audience. Knowing all you can about them beforehand will make this process easier and make you more comfortable with your presentation preparation and delivery.

It is also important to familiarize yourself with your program location. How is the room set up? Can it be changed? Find out if there are windows in the room and if they have curtains or blinds. This will affect the types of audio visuals you can use. You can also find out if the group can provide any audio visual equipment for you. It is much easier to bring a video tape for an on-site VHS player and monitor than to unknowingly bring a projector, screen and 16mm film. Don't forget about your extension cords either!!!

Anticipate the mood of your audience by knowing the time of day you will be speaking: before or after a meal, early in the morning or late at night, to kick off a day of speakers, or to wrap it up.

SPEECH PREPARATION

There are three basic parts to any presentation - the introduction, the body, and the conclusion. The introduction states the topic of your program and your purpose for being there. The body of your presentation should present the main facts, and the conclusion should summarize what you have said. Another way to say this is to "Tell 'em what you're gonna tell 'em, tell 'em, then tell 'em what you've told 'em."

The introduction is one of the most neglected, yet most important parts of a presentation. If you do not get the attention of your listeners immediately, it is unlikely that you will pick them up along the way. This can be done by using examples specific to your audience about why this topic is so important. For example, tell a new parents group that young children and the elderly are the most frequent victims of burns. You might also be prepared with a good quotation or simple, yet shocking statement of fact. State your topic early in the presentation so you don't let the audience sit and wonder what you are getting at. Be sure to introduce yourself and give enough background to establish credibility with your audience during the introduction, and make an effort to establish a rapport with the audience.

One last tip, not only for the introduction but your entire presentation - keep it positive!! If you start out apologizing for being late or for forgetting something, you set a bad tone for the rest of the program. Ignore those things that go wrong (and they will go wrong), and focus on the positive. You have the responsibility to set the tone for the program.

The body of the presentation is the facts. Here is where you cover the main points you wish to get across. Write clearly stated goals and objectives before the program and stick with them. It is better to cover three or four points thoroughly than to cover ten points in a hurried, scattered fashion. Be sure your main points are clearly worded and receive enough attention to be clear to the audience. Use questions to obtain feedback if there is any doubt.

The main points of your presentation can be backed up by several types of information. You can use practical examples, stories or "what if" scenarios to get your point across. Statistics can be impressive and really drive a point home, but to be effective they must be kept simple and used sparingly. Be sure to draw on personal experience also. Fire fighters, especially, have a wealth of information to add that can help get a point across. Use what you've got to deliver your message.

During the body of your presentation, it is important to watch your audience carefully for signs of boredom or confusion. If people look confused, or are beginning to check their watches or squirm in their chairs, you know it's time to liven things up, try a new approach, or end the program. If they have requested a 30 minute program, it is your responsibility to respect this. Don't overstay your welcome.

The last portion of your presentation, the conclusion, should be used to reinforce your main points, allow time for questions, and thank the audience for their time and patience. Be careful not to over extend the conclusion or to appear overly anxious to leave. Such behaviors irritate your listeners, and rightfully so. Give them the time, courtesy, and attention they deserve.

Following your presentation, it is important to reflect back on any areas where you were uncomfortable or that did not flow smoothly. Make changes based on this analysis and you will find that before long your programs will appear polished to even the most discriminating audience, including yourself. Lastly, be enthusiastic and show your audience that you are enjoying the opportunity to make the presentation. If you are able to have a good time, it is almost guaranteed that your audience will too!

Use the following guidelines to prepare a speech:

- o Narrow the topic to a central idea that the audience should receive.
- o Gear the speech to the interests of the audience.

- o Capture the audience's attention immediately (facts, questions, quotes, personal experience).
- o Use a positive, not a negative approach.
- o Use a natural vocabulary and style. Use a three-part outline which (1) states the topic and purpose, (2) introduces supporting ideas, and (3) summarizes the presentation.
- o Use transitions when moving from one major point to another to avoid "ah's" and "ok's."
 - To begin with...
 - First I will discuss...
 - Next...
 - My second point deals with...
 - In conclusion...

EFFECTIVE PRESENTATION TECHNIQUES

- o Never read from a script. You will bore your audience and yourself if you do. A good outline should be adequate if you follow the next suggestion.
- o Be familiar with your topic. Know as much about it as you possibly can. The more you know, the more comfortable you will be with your program material as well as with questions from the audience.
- o Appearance is important! Even a uniform can look messy if a shirt is untucked, the shoes are scuffed, or remnants of lunch are obvious. Present yourself as the professional you are.
- o Be enthusiastic and motivated!!! Even if you got "stuck" with the assignment, you should make the most of it. If you act like you are having fun, then you probably will.

- o Empathize with the audience. Many speakers tend to scold their listeners for not doing the right thing. It is better to sympathize and offer alternatives than to reprimand and order them to do something. After all, we all want to be understood.
- o Be creative with your programs. It doesn't have to be "just another program." It will be as memorable as you make it.
- o Use gestures where appropriate, but be reasonable.

Some gestures to avoid:

- Wringing hands
- Hands in pockets
- Arms folded across chest
- Pacing

Some gestures to consider

- Using fingers to indicate numbers
 - Raising arm when asking for questions (encourages the audience to do the same)
- o Maintain eye contact with the audience. But do be careful not to stare or to focus on one or two people.
 - o Maintain high conversational quality. In other words, know what you are saying, and say it correctly.
 - o Have a sense of humor. Sometimes funny things do happen -- react appropriately.

- o Be honest. If you don't know the answer to something, say so. Be careful not to exaggerate, also.
- o Pay attention to your voice and what it sounds like.
 - Volume
Adjust your voice according to the size of the room, size of the audience, and any background noise.
 - Rate
Not too fast, not too slow.
 - Pauses
Mark Twain said "The right word may be effective, but no word is ever as effective as a rightly timed pause."
 - Pitch
Is the highness or lowness of your voice. You can sound happy, sad, excited, bored, pleased or angry.
- o Avoid distracting mannerisms. These include:
 - Chewing a pencil or toothpick
 - Pacing the floor
 - Frowning or glowering
 - Playing with chalk
 - Using the same words over and over (um, alright, okay)
 - Cleaning or biting fingernails
 - Jingling coins/keys in pocket
 - Watching the clock
 - Fingering jewelry
 - Blowing nose while talking

PRONUNCIATION

We all mispronounce words now and again. Here for example, are five words with which you are probably familiar. Say each word out loud:

athlete electoral nuclear February theater

Very likely you made a mistake on at least one, for they are among the most frequently mispronounced words in our language. Let's see.

WORD	COMMON ERROR	CORRECT PRONUNCIATION
athlete	ath-a-lete	ath-lete
nuclear	nu-cu-lar	nu-cle-ar
theater	thee-ate-er	thee-a-ter
electoral	e-lec-tor-e-al	e-lec-tor-al
February	Feb-u-ary	Feb-ru-ar-y

Every word leads a triple life; it is read, written, and spoken. Most people recognize and understand many more words in reading than they use in ordinary writing, and about three times as many as occur in spontaneous speech. This is why we occasionally stumble when speaking words that are part of our reading or writing vocabularies. At other times, we may mispronounce the most commonplace words out of habit.

The problem is we usually don't know when we are mispronouncing a word, or otherwise we would say it correctly. If we are lucky, we learn the right pronunciation by hearing someone else say the word properly or by having someone gently correct us in private. If we are unlucky, we mispronounce the word in front of a roomful of people, who may raise their eyebrows, groan or laugh. Even experienced speakers sometimes fall into this trap. A TV news anchorwoman was reporting a story about corporate mergers and takeovers. In the course of the story she referred several times to the takeover of "Co-No-CO" by the DuPont Corporation. When she had finished, her co-anchor turned to her and said (on the air): Yes, and they're also trying to take over CON-o-co." The anchorwoman passed it off, but she was noticeably embarrassed.

ARTICULATION

Articulation and pronunciation are not identical. Sloppy articulation is the failure to form particular speech sounds crisply and distinctly. It is one of several causes for mispronunciation; but not all errors in pronunciation stem from poor articulation. You can articulate a word sharply and still mispronounce it. For example, if you say the "s" in "Illinois" or the "p" in "pneumonia" you are making a mistake in pronunciation, regardless of how precisely you articulate the sound.

Whether or not Americans have "the worst articulation in the Western World" as one scholar claims, many of us are unquestionably slovenly speakers. We habitually chop, slur, and mumble our words rather than enunciating them plainly. Among college students, poor communication is more common than ignorance of correct pronunciation. We know that "let me" is not "lemme", that "going to" is not "gonna", that "hundred" is not "hunert", yet we persist in saying these words improperly. Here are some other common errors in articulation that you should work to avoid.

WORD	MISARTICULATION	WORD	MISARTICULATION
pretty	purdy	did you	didja
ought to	otta	want to	wanna
suppose	spose	just	jist
any	iny	because	becuz

STUDENT INFO

ORAL COMMUNICATION

SAMPLE PRESENTATION OUTLINE FORM

TITLE OF PRESENTATION: (Smoke Detectors)

INTRODUCTION:

- I. Attention getter (Most people who die in fires never see flames)
- II. Identify the main points to be examined in the presentation (Smoke detector purchase, installation, and maintenance)

BODY:

- I. Main Point (There are two types of smoke detectors)
 - A. Sub-Point (The first one is a photoelectric)
 1. supporting material (Powered by regular household current)
 2. supporting material
 - B. Sub-Point (The second type is ionization)
 1. supporting material
 2. supporting material
- II. Main Point (Both types will do the job - but they must be properly maintained)
 - A. Sub-Point (Photoelectric)
 1. supporting material (Should be checked once a month)
 2. supporting material

CONCLUSION:

- I. Summarize Main Points (Remember --- there are two types of smoke.....)
- II. Leave audience with a final persuasive statement (Give the gift of life....)

HOW TO MAKE YOUR LISTENERS LIKE YOU

1. If you are honored or pleased, say so.
2. Give the audience sincere appreciation.
3. Whenever possible, mention the names of some of your listeners.
4. Play yourself down - not up!
5. Say "we" instead of "you" when possible.
6. Be friendly - don't talk with a scowling face and upbraiding voice.
7. Talk in terms of your listeners' interests.
8. Have a good time making your talk.
9. Do not apologize.
10. Appeal to the nobler emotions and motives.
11. Welcome criticism - instead of resenting it.

HOW TO OFFEND AND IRRITATE YOUR AUDIENCE

1. Apologize.
2. Speak too long.
3. Conclude and conclude and conclude.
4. Talk down to your listeners.
5. Be defensive.
6. Be unprepared.
7. Be unorganized.
8. Tell an old joke.
9. Speak without conviction.
10. Telegraph to your audience that you don't really know who they are.

REASONS FOR UNSUCCESSFUL SPEECHES**I. PREPARATION**

- o Lack of background
- o Canned speech
- o No introduction
- o Lack of knowledge of audience
- o Inflexibility
- o Not knowing physical environment of classroom
- o Not taking advantage of props
- o Basic lack of organization
- o Not enough advanced notice
- o No preparation

II. MESSAGE

- o Visual aid failure
- o Too lengthy
- o Too technical
- o Lack of attention getters
- o Ineffective transfer
- o No credibility established
- o No humor
- o No statement of purpose
- o Lack of examples
- o Lack of persuasive conclusion

III. AUDIENCE ASSESSMENT

- o Misjudging audiences - not relating to group
- o No direct contact between teachers and class
- o No audience involvement
- o Too technical
- o Lack of audience responses
- o Failure to challenge audience
- o Not enough time for questions
- o Talking too long
- o Allowing questions to stray from major points
- o Talking down to the audience

IV. SPEAKER QUALITIES

- o Lack of commitment
- o Over confident
- o Speaker that makes excuses
- o Overbearing/pompous
- o Can't hear, poor voice
- o No energy, enthusiasm
- o Mannerisms (no eye contact)
- o Ineffective use of gestures
- o Not receiving feedback
- o Physical appearance

AUDIO VISUAL MATERIALS OVERVIEW

Almost any program can be enhanced by the proper use of audio visual materials. Care must be taken, however, to ensure that any audio visuals used fit the program, the location, and the needs of the audience. The role of any audio visual is to:

- o Support the information being presented.
- o Create interest in the topic at hand.
- o Provide emphasis to the key points or behaviors.
- o Provide sensory appeal and thus get the audience's attention.
- o Save time. There are situations where a picture really is worth at least a thousand words.

When using an audio visual as a part of your program, there are a few basic guidelines to keep in mind. First of all, be sure that your audio visual can be seen by the entire audience. In order for this to be possible, you may have to rearrange the room before the presentation. If it is not possible for everyone to see the material being used, it may be best to do the program without the audio visual.

Be sure that your audio visual is manageable. Even the most expensive materials become useless if you have not practiced using them, or if you devote more time and attention to making your audio visual materials work than to your audience. It is also important to remember to talk with and to your audience, and not to your audio visual. This is especially important when using charts, graphs or flip chart materials. Practice with these materials beforehand until their use is second nature and not your primary focus. Your audio visual materials should always enhance, not detract or steal from your presentation.

If your audio visual is an actual object, it is wise to avoid passing it around during the main part of your presentation, especially in a children's program. Instead, you can invite the audience to view the item after the program, or perhaps pass it around during the question and answer session to pose the least possible distraction from what you are saying.

Last, but certainly not least, be prepared to do your program without your audio visuals. Those who have done a great deal of public speaking know that anything that can go wrong, will go wrong sooner or later, and you should be prepared to deal with this possibility. There are always last minute changes to accommodate and equipment

failure, lack of electricity, etc. may require you to change your plans. The more time you can devote to anticipating these problems beforehand, the better prepared you will be to cope with them. Flexibility is the key to maintaining top performance as a speaker.

ADVANTAGES AND DISADVANTAGES OF FILM

ADVANTAGES:

It enables reproduction of color or black and white visuals with motion to display relevant stimuli or responses required in training.

- o Special visual effects can be produced that may enhance learning. These effects are particularly helpful in presenting effective materials and can increase student involvement. Depending on the writer's creativity and imagination, some film effects are: (1) compression or extension of time or the illusion of activities going on at the same time, (2) split or multiple images on one screen or a variety of visual distortions and illusions, (3) a smooth flow of visual changes from one section to the next, and (4) the exaggeration of motion through slow, stop, or fast speeds.
- o The long history of films has developed large resources of available films in libraries.
- o The variety of available film sizes and types can provide visual displays for use with large audiences (unlike video) and small groups, or for individual viewing.
- o Film can be used with both front and rear screen projection.
- o The content and sequencing of training materials can be locked in, and also used interactively with workbooks, lesson guides, etc.
- o Film projectors are generally more readily available than video equipment (even in remote locations), portable, and simple to operate.
- o The quality of visual and sound when transferred to video tape is generally better than that of transfer of video to film.

- o Standardized film sizes (unlike video) allow for use on an international basis ensuring viewing when needed.

DISADVANTAGES:

- o Production costs are high, and talented production teams are scarce.
- o Film processing requires time for development. There are no instant feedback capabilities.
- o Institutions frequently do not have low-cost, in-house facilities for producing quality sound films.
- o Film stock cannot be erased and reused.
- o Care must be taken in the handling of films to prevent breakage; films must be cleaned regularly.

ADVANTAGES AND DISADVANTAGES OF FILMSTRIPS

ADVANTAGES:

Film strips can be used as either an instruction aid or an instructional medium. As an instructional aid, filmstrips permit instructors to:

- o Control the pace of the presentation.
- o Back up visual displays to review specific points.
- o Capitalize on a large visual display to point out critical items.

As an instructional medium (when used in combination with audio or print), filmstrips provide locked-in visual content and sequence which ensures lesson integrity and safeguards against visual being lost, reversed, or out of sequence. The compact size of the visuals accommodates the production and distribution of individualized lesson material. Inherent advantages of film strips are:

- o They are easily reproducible in large quantities.

- o They can be used with both front and rear screen projection.
- o They are small which permits compact packaging and storing, ease of distribution, and convenient transportation for use in various locations.
- o Reproduction of filmstrips in large quantities is generally more economical than slides in cost per projected visual.
- o Packaging problems are minimal. Standard containers for filmstrips, with or without audio components, are available to make lesson units easy to store, distribute, and use.
- o Since filmstrips with sound are packaged with audio accompaniment on discs, tapes, or (usually) cassettes, alternative sound tracks for different audiences are easily provided, such as in various foreign languages or for technical and nontechnical audiences.
- o Versatility of display design allows for progressive disclosure of information, the suggestion of motion, and special effects through photography and/or artwork and graphics.
- o Equipment for projecting and viewing filmstrips, with or without sound, is available in a wide variety of types and costs. Modern machines are compact, easy to use, generally reliable, and easily transported.

DISADVANTAGES:

- o Filmstrips generally require dimmed lighting for adequate visual display; they require room darkening and light control when used as an instructional aid.
- o Because of the lock-in sequence of visuals on a strip of 35mm film, editing and updating of filmstrip materials may become more time-consuming and expensive than slides.
- o Since several modes of providing sound for use with filmstrips are available, it is essential for course developers to determine what kind of equipment is necessary for utilizing programs to be produced, and to select the proper audio medium (disc, tape, or cassette) and synchronization method.

- o Artwork for filmstrips and photographs on 2 x 2 slides to be used in filmstrips require a 3:4 ratio of height to width.
- o Because filmstrip processing requires copy stand and laboratory processing, the time required for the preparation of release prints is often longer than processing slides.

ADVANTAGES AND DISADVANTAGES OF OVERHEAD TRANSPARENCIES

ADVANTAGES:

- o Allows freedom for instructor to edit, sequence, and revise instructional material.
- o Allows instructors to face an audience in a lighted room to permit interpersonal exchange and to encourage questions and discussion.
- o Permits instructors to write on a transparency, use a pointer, or edit items during projection.
- o Provides opportunity for simple visuals in black line or in colors, or in combination.
- o Permits sequential disclosure of information by adding to an initial base visual using overlays, thus building the display.
- o Permits local production of transparencies by the instructor or semi-skilled staff.
- o Permits generally inexpensive production of visual materials and, when small quantities are needed, for simple and economical distribution.
- o Permits display of transparent or translucent materials on the stage of the projector, and enlargement for viewing on the projection screen.
- o Permits motion within limits, by translucent plastic cut-outs or by a more sophisticated and expensive process of using polarized plastic sheets and a hand or motor-driven polarized rotor in front of the projection lens.

- o Offers a variety of portable and permanent projectors with various lenses for adjusting picture size to projector screen distance requirements.
- o Permits adaptation of transparency masters, by plan, for paper prints to be used as handouts or for evaluation purposes.

DISADVANTAGES:

- o Limited to use as an instructional aid by an instructor or by students for their presentations. Seldom used as an instructional medium.
- o Widespread distribution of transparencies individually or in sets may be less convenient than the more compact slides or filmstrips, for example.
- o Multicolored, commercially or locally produced transparencies may be more expensive than 35mm slides.
- o When using overhead projection, distraction or discomfort may be caused by the flash of unfiltered white light on the screen while changing transparencies.
- o Designed for front screen projection, the overhead is seldom used for rear screen projection, except in unusual circumstances.
- o If overhead transparency formats are to be transferred to 35mm slides, or made into printed paper handouts, special attention must be given to such matters as scale, proportions, lettering size, and border spaces around the pictorial image.
- o Often requires a special tilted screen to avoid extreme keystone effect that distorts the visual image.
- o If a large number of visuals are needed, the size can make them cumbersome to work with or bulky for transporting.

ADVANTAGES AND DISADVANTAGES OF USING REAL THINGS FOR INSTRUCTION

ADVANTAGES:

- o Can provide students with maximum amount of realistic job or task simulation, reducing the necessity for transfer of learning.
- o Can display all or most of the relevant stimuli from the work environment, yet often with markedly reduced cost.
- o Allows students to experience and practice manipulative skills using their tactile sense.
- o Permits easy measuring of student performance when physical dexterity or coordination skills are required for job tasks.

DISADVANTAGES:

- o Frequently can present safety hazards to students or others in the work environment.
- o Can be expensive due to the cost of the equipment and possible damage to it.
- o Cannot always present all necessary views of actual objects, such as enlargements, cut-away and sectioned views; the lesson content must then be supported by other media as required.
- o Often it is difficult to find or to hire subject matter experts to conduct on-job training; taking skilled personnel off their jobs to train others can reduce productivity.
- o It can be difficult to control learning due to conflicts with job or classroom environment.

ADVANTAGES AND DISADVANTAGES OF SLIDES

ADVANTAGES:

- o Color visuals can be produced economically in slides.
- o Slides are reproducible in large quantities.
- o The small size of slides allows for compact packaging and storage, ease of distribution, and convenient transportation for use in various locations.

When slides are used as an instructional aid:

- o Instructors can adapt their lessons for different student groups or vary emphasis by deleting or adding slides before each presentation.
- o Instructors can back up visual displays to review specific points.
- o The large visual display on a screen allows an instructor to point out critical items.

Slides can also serve as an instructional medium when used in combination with audio. For example: A preprogrammed sequence of slides can provide exact visual content that can inhibit the tendency of various presenters or instructors to revise or improvise lessons. The compact size of slides facilitates the production and distribution of individualized lesson materials.

Versatility of display through slides allows for:

- o Visuals to be designed for progressive disclosure of information
- o Visuals designed to present special visual effects such as cut-away or enlarged views of objects, and distortion of image for impact.
- o Economical (and realistic) visual representations of what the student will see in the real world.

DISADVANTAGES:

- o Effective projection of slides generally requires lighting to be dimmed and controlled for an adequate visual display. Usually this concern presents a problem only when slides are used as an instructional aid.
- o Processing is seldom done locally. Depending upon available laboratory services, you must wait from 24 hours to several days for commercial film development and mounting of slides. Fast developing service is available, but always with substantial extra charges.
- o Artwork formats must be specially designed for slides to be used with video.

ADVANTAGES AND DISADVANTAGES OF VIDEO

ADVANTAGES:

- o Reproduce motion (with or without sound) to display both relevant stimuli and desired student responses required by the instruction. One example of this use is displaying vignettes that show the interaction of people, to show the student what should (or should not) be done.
- o Provide instant replay to critique or evaluate the performance of students by taping selected actions. For use in courses, for example, on how to develop interpersonal skills, interviewing techniques, conducting meetings, and giving presentations; and for instructors or speakers, guidance in editing material before final presentation.
- o Produce visual effects to enhance either the learning process or entertainment value of the presentation. Depending on the writer's intent and ability to visualize effects (and the production staff), some of the effects that can be produced on video tape are: (1) compression or extension of time or illusion of activities going on at the same time, (2) split or multiple screen images for a variety of visual cues, (3) a smooth flow of visual changes from one scene to the next, and (4) the exaggeration of motion through various speeds from slow to fast.

- o Lock in content and sequencing of the training used interactively with workbooks, guides, texts, tools, or other things used on the job.
- o Produce the same information simultaneously to various sized audiences in different locations by having monitors in additional classrooms.
- o Produce self-paced instruction (frequently in combination with computer-based, or printed material) for individualized study.

DISADVANTAGES:

- o Implementing materials requires video equipment to be locally available and compatible with the video tape (size and format) that is distributed.
- o Video script writing is difficult and time-consuming.
- o Production costs are high and talented production teams scarce. Visual quality when transferred to film may be poor.
- o Small monitor screens limit audience size unless multiple monitors or video projection systems are used.
- o The amount of lettering on graphics for video is limited to about one-half that of film or still visuals.
- o Care must be taken when using colored graphics for black and white TV. For example: Some shades of red and green appear the same on a black and white screen. Whenever possible use graphics made in black and white and shades of gray.
- o Rapid changes in technology make obsolescence of video systems a continuing problem.

ADVANTAGES AND DISADVANTAGES OF PRINTED MATERIAL

ADVANTAGES:

- o Students can stop at any point in the material to refer to other sources, e.g., dictionary, reference text, use a calculator, etc., and continue on.
- o Students can proceed at their own pace. Lesson material can be designed in a variety of ways to allow for self-paced instruction. This technique can allow for varying learning speeds, dependent on the student's reading ability and entering level skills.
- o Material is usually very portable. Students can study materials where and when they choose.
- o The student or instructor may easily review the lesson materials. The material can also be retained by the student for reference on the job.
- o Black and white art work or photography may be easily adapted to the printed page. When communication problems can be better solved, the cost of two or more color printings may be justified.
- o The lesson content is locked in but can be resequenced easily by student or instructor, or by revisions of the materials.
- o The lesson materials can be reproduced economically, distributed easily, updated or revised just as easily, used to display still visuals in either color or black and white, used as either an instructional aid or an instructional medium, and be easily moved from one location to another.

DISADVANTAGES:

- o Printing time alone may take from several days to much longer, depending upon the complexity of the material and local services.
- o Colored artwork or color photography is usually expensive to adapt to printed material.

- o Motion is difficult to show on the printed page.
- o Extensive lessons presented in word copy alone tend to turn off and bore students. A similar serious problem can occur with long units of programmed instruction. Careful attention must be given spans of study time and design of material.
- o Unless given care, the material can be damaged, lost, or destroyed.

COMMUNICATION: KEY TO CAREER ADVANCEMENT

AUDIO-VISUAL AIDS: THE CASE OF THE DOG-WAGGING TAIL

by Richard B. Salzberg

"ENGINEER" - June 1983

Many of us in engineering and scientific establishments are actually in what used to be called "the locomotive business" - meaning that one sale, an enormously complicated and expensive process, was plenty for the year.

And of course, it also meant that each "locomotive" was virtually unique, in that each major project (today we call them superprojects) inevitably was one of a kind.

A few years ago, a major organization was attempting to win the contract for such a project. After the obligatory opening rounds of discussion and submittal of an encyclopedic proposal, the day for the final and decisive presentation dawned. In came the clients, wearing the customary enigmatic smiles. Finally the lights dimmed, and some very high-priced help from the bidding firm rose to begin the requisite major address.

The first speaker explained that they would make full use of the latest proven technology including the then-new wizardry of videotape. The rest of this presentation was, indeed, videotape. Shots of the model. Of the proposed site. Of key project personnel, each of whom spoke a few beaming words into the camera and microphone. Of the key concepts, shown in elaborate animation, with sound effects and color.

The second speaker introduced slides to the still-smiling clients. The third had more slides, followed by more videotape and films. The live presentation, followed by thorough Q & A, never came. The clients rose, furious and tight-lipped, murmured a few words to their hosts, and disappeared forever so far as that project and that firm was concerned.

Where live individual attention is needed, there is no substitute. When too much canned, or recorded, or slide material is used, the tail wags the dog. Listeners expecting a custom-tailored live presentation are not only frustrated and disappointed but quite often angry -- feeling that they have been treated, not with individual concern

and thought addressed to their unique requirements, but to canned material shown on every tour of the premises. It is always deadly to let your aids overpower your basic talk or presentation. In the case of audiences expecting, and entitled to, a specific discussion of a specific situation, who then receive audio-visual aids, do not be surprised if you find them advancing on your rostrum in a threatening mood, ballpoints and attache cases poised for vengeance.

Even when some of your material is the same in each case, it should never appear canned, or tired, or the standard pitch. Whenever it does, you have lost your audience, no matter how wondrous their comprehension of your data. Unless they are the veriest of tourists, they will invariably be mortally offended by this impersonal treatment.

With this in mind, plan your audio-visuals to complement your talk. In the last column we discussed the new multi-media shows, but in our examination this month of audio-visual, we speak of aids to comprehension and to empathy and willingness to listen. If your talk is intended chiefly to persuade while you inform, make sure that your aids do indeed aid, helping to generate sympathetic understanding as well as technical understanding. Once you are sure that your material is tailored correctly to your audience, then you should examine it for simple human understanding.

In another case, a speaker extolled molecular manipulation in chemical research. He explained that tiny modifications can mean extreme changes in the chemical's effects, a point reasonably well understood and accepted by his audience.

Another speaker dealt with the same point differently; he displayed a molecular model of the benzene ring. He described the properties of the industrial solvent benzene represented by his model. Then he added a group of atoms to the model and explained that he now had benzoic acid, a food preservative. Finally he added a third group of atoms, explaining that the new compound thus formed had painkilling qualities: aspirin. His audience, you can be sure, understood immediately and remembered his talk in which the use of aids was perfectly balanced with his data.

Alas, speakers using slides seldom approach this communications Nirvana. All too often they use too many; anxious to communicate as much as possible so that just the opposite effect occurs -- an audience becomes confused at the start of a talk and stays that way throughout.

Even savings of \$100,000 do not look impressive when scribbled on a projected transparency.

A good rule of thumb starts with an audience of about 40. If you are using charts, something the size of a newspaper page can be seen by a group that size. Anything larger demands projected materials. Overhead transparencies, of course, can be used only with very small audiences, particularly if you are adding handwritten notations.

"Newspaper page" does not, of course, mean that you should use that much material per chart. The opposite is true. Never put more than ten words or so on a single chart or slide. A rule observed more in the breach than otherwise. And if you have handouts, do not distribute them at the start or in the middle, or your audience will be distracted throughout. If you have an exhibit you want visible only during part of your talk, then cover it the rest of the time. An audience, if it is to glean anything from your talk, must have only one focus at a time.

K. W. Sehnert lists commandments for speakers using aids:

Thou shalt not use slides with blue or black backgrounds.

Thou must be able to read 35mm slides without a magnifier.

Thou shalt not use more than three comparative results per slide.

Thou shalt not cause multiple-line graphs to be shown.

Thou shalt forswear the use of over-elaborate computer graphics, decorations, and use only graphs that tell the story at a glance.

Thou shalt ad color or photos whenever possible, but keeping the point and graph simple and clear.

WRITTEN COMMUNICATION

Written communications are an important part of every public educator's job. Writing skills are used by the educator to develop brochures, prepare letters, write reports, and to formulate press releases about such events as fires, personnel promotions, upcoming events, and fire safety information. Not everyone is anxious to become an author, however, and a few basic guidelines may help those who are unsure of their writing skills.

First of all, if you know that your writing skills leave something to be desired, it would be to your best interest to consider obtaining formal education to improve them. The same is true if you do not have a good grasp of the English language. There are many courses available at the junior college level that can improve your writing skills and boost your confidence for this type of assignment and you can be sure that it will be time well spent.

Another thing to keep in mind is that very few, if any, really good documents are produced in a first draft. Good writing takes time, as well as lots of rewriting. It is best to start an assignment a couple of days in advance so that you can write an article or news release and then set it aside for a day or two. Coming back to it may give you a new perspective, point out any omissions of fact, or let you feel comfortable with your work as it was originally written. Computers have made this a much more timely process, as well.

Finally, it is imperative that you take the time to proofread your work for both typographical errors and spelling. Spelling is very important, so if you know this is a weak spot, work with a dictionary close at hand and don't be afraid to find a good resource person. There are lots of people who are quite good at spelling and proofreading and would be pleased to assist you with proofing your work, so don't let pride stand in your way. Take pride, instead, in knowing that your finished product is of professional quality. It is also a good idea to have someone else read your work to ensure that it is clear and easy to understand, especially if what you are saying is of a technical or detailed nature. Accept their suggestions openly and you will find you can improve your skills with each assignment.

NEWS RELEASES

This course focuses on the news release form of written communication since this is a common assignment for the public educator. What is a news release? It is simply a short, factual description of, or point of view on, an event or issue which is prepared for the media. The press release can be used to keep the community informed of special events and upcoming programs, to announce department happenings such as promotions or retirements, for incidents such as fires or hazardous materials spills, or to provide general information, such as in a holiday safety press release.

Keeping the community informed of special fire department programs is effectively managed through distribution of news releases.

TYPES OF RELEASES

1. Advance

A news release which covers an event, project or activity scheduled for a future date. Its purpose is to attract attention and create interest.

2. Current

A news release which reports an event which has just happened and is timed for immediate publication.

3. Follow-Up

A news release which explains the results or conclusion of a previously reported event or subject.

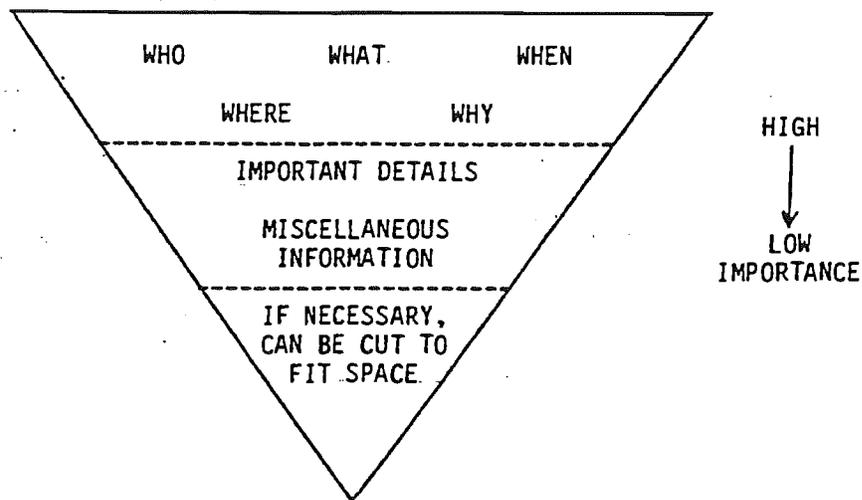
4. Timeless

A news release which covers basic material which can be published at any time. Timing is less crucial to its appeal.

WRITING A PRESS RELEASE

There are two basic parts to the press release - the lead and the body. The lead does three things. First of all, it answers most of the questions by addressing the Five W's. In other words, the lead gives you the who, what, why, when, and where of the story. It also emphasizes the most important facts by putting them first, as well as quickly identifying the persons, places, or events necessary for an understanding of the story.

The body of the news release simply amplifies the news presented to the reader in the lead, giving more detail and feeling to what actually took place or is planned. This information should be presented in most to least important order in the body so that it can be cut easily by an editor if necessary to fit available space. The finished story should resemble an inverted pyramid, with the top of the pyramid being your lead - the facts. The release should then dwindle to the bottom with the least important information placed here.



The best way to learn to write good releases is to read good releases. Those written by the Associated Press (identified in many papers with the initials AP) or other professional news agency are of a professional quality and they can provide you with a great deal of understanding of how a good release should be written. Finally, as with most areas of communication, practice will make you a better writer. So grasp every opportunity to fine tune your skills and write, write, write!

EXAMPLE OF NEWSPAPER REPORT

EARLY MORNING FIRE
CLAIMS LIFE

John Smith, 25, died in a fire yesterday morning. The fire started at 1 a.m. in Smith's apartment at 110 2nd St. The fire was caused by a cigarette dropped on a chair.

Fire officers stated that the fire was confined to the living room and that Smith died of smoke inhalation while asleep in his bedroom.

Fire Chief Robert Johnson stated Smith's apartment was not equipped with a smoke detector. The Chief indicated that a smoke detector would have increased Smith's chances of survival.

There were no other injuries. The fire caused \$10,000 in damages.

TOPIC: Public Fire Education News Releases

SAMPLE NEWS RELEASE FORM

Name of fire department or organization
Address, City, Zip, Telephone

(Use letterhead stationery when possible or make a special form for news releases.)

Release Date

Contact Person(s)
Name and Title
Phone #

START NEWS RELEASE 1/2 WAY DOWN ON THE FIRST PAGE

- _____ have 1 inch margins
- _____ use only one side of paper
- _____ if more than one page, place ***** MORE ***** at the bottom of each page, except the last page.
- _____ after the first page, number each page in the upper left hand corner; also indicate what the story is about in the same place, i.e., Fire Prevention Week Announcement.
- _____ be sure the major information - the who, what, when, where - are in the lead paragraph.
- _____ background and pertinent information in the next paragraph.
- _____ additional information in the following paragraphs.

NEWS RELEASE

**LOCALITY FIRE DEPARTMENT
525 East Main Street
Locality, California 92231
(515) 923-6345**

Release Date: July 1, 1988

**Contact: Dudley Doright
Fire Fighter
(515) 923-6357**

PROGRAM ON SMOKE DETECTORS TO BE PRESENTED

The Locality Fire Department will be presenting a program on smoke detectors at the Elks Lodge on Thursday, July 22, 1988 at 7:00 p.m. The program is free to the public.

The Elks have arranged for this program in response to community concerns regarding home safety since a major fire in the city killed one, and injured two people, in May.

The fire, caused by an overloaded extension cord, occurred at 1921 Baywood Drive and also damaged two other residences. The home had one smoke detector, but this detector did not activate because the battery had been removed. Fire Department officials have stated that an operable smoke detector would have given the residents time to escape before the fire got out of control. detector did not activate because the battery had been removed.

***** MORE *****

Page Two
Program on Smoke Detectors

Fire fighter Dudley Doright will be delivering the presentation which will cover how to purchase a smoke detector, basic requirements for installation, and routine maintenance procedures. Fire fighter Doright will also be discussing the fire and how such a tragedy can be avoided in the future.

For more information about this program, or to obtain fire safety information, call the Locality Fire Department at 923-6357.

REFER TO PUBLIC FIRE EDUCATION PLANNING BOOKLET

PRINCIPLES OF FIRE BEHAVIOR

The basic definition of fire or combustion is a chemical process in which a fuel combines with oxygen from the air with sufficient intensity to produce heat and light. However, another definition of fire is the rapid oxidation involving a chemical combination of the element oxygen with some other element or compound. For example, when wood, a compound which contains carbon (C - an element) and hydrogen (H - an element) burns, it combines with oxygen (O - an element) and forms new substances, carbon dioxide (CO₂) and steam (H₂O). Burning is, therefore, an example of a chemical change.

By definition, an element is a substance that cannot be separated into simpler substances during a chemical reaction; while a compound is a substance that can be separated by chemical means into two or more simple substances; and oxidation is the process of uniting oxygen with another substance. Oxidation may be extremely rapid, as in an explosion or very slow, such as the rusting of iron, the souring of milk, and the decaying of fruit.

Three things necessary to support combustion are:

- o Sufficient oxygen to support combustion
- o Sufficient heat to ignite the substance
- o A combustible substance, fuel

OXYGEN

Normally, air is composed of 21% oxygen, 78% nitrogen, and 1% other gases. At this point, a fire is usually free-burning. When the oxygen is reduced to 17%, the burning process will slow down and carbon monoxide production will be increased. When the oxygen supply is reduced to 15%, smoke will be dense as the fire is then in the smoldering stage, producing more carbon monoxide and combustible gases. When the oxygen supply is reduced to 13%, not enough oxygen is present to support combustion, and therefore, no flame will be visible. However, it can be assumed that once the oxygen supply is reduced to 15%, the flame is extinguished.

HEAT

All matter contains some amount of heat, regardless of the temperature, due to the fact that the molecules are constantly moving. If the temperature is increased, the movement of the molecules within the substance intensifies and creates heat energy. Heat energy can be generated through four categories: chemical, mechanical, electrical and nuclear.

Chemical Heat Energy

- o Heat of combustion - The amount of heat developed by the combustion process.
- o Spontaneous heating - The internal heating process of an organic material without the application of any external heat source. This condition most frequently occurs where sufficient air movement is not present to dissipate the heat produced.
- o Heat of solution - Some chemicals, especially acids, when dissolved or mixed with other material, produce heat.
- o Heat of decomposition - Certain compounds while going through the process of decomposition may become unstable and begin to release heat so rapidly they may deteriorate.

Mechanical Heat Energy

- o Sparks - The action of solid objects, one of which must be metal, striking together and generating heat in the form of sparks.
- o Frictional heat - The generation of heat by the movement between two objects in contact with each other.
- o Heat of compression - Compression of a vaporized substance in a confined space generates heat.

Electrical Heat Energy

- o Induction heating - The heating of materials resulting from an alternating current flow causing a magnetic field.
- o Resistance heating - The heat generated by passing an electrical force through a conductor such as a wire or an appliance.
- o Dielectric heating - The heating that results from the action of either pulsating direct current or alternating current at high frequency on a nonconductive material.
- o Arcing - Heat released from a high temperature arc or as molten material from the conductor.
- o Leakage current heating - When electrical materials, which are imperfect or improperly insulated, are utilized to handle high voltages or near capacity loads, the generation of heat may result.
- o Static electricity - Heat released as an arc between oppositely charged surfaces.
- o Lightning - The heat generated by the discharge of the thousands of volts associated with a lightning strike.

Nuclear Heat Energy

- o Nuclear fission and fusion - The heat generated by either the splitting or combining of atoms.

FUEL

At normal atmospheric temperatures, fuels appear in three physical forms - solids, liquids, and gases. Solids have to be heated to bring out vaporization. Some liquids vaporize at normal atmospheric temperatures, and others have to be heated.

In the burning of most substances, the actual combustion takes place only after the solid or liquid fuel has been vaporized or decomposed by the heat to produce a gas. It can then be concluded that combustion is the continuous burning that takes place following the ignition of the substance or fuel. In the case of solid fuels which do not evaporate or decompose to form gases at ordinary fire temperatures, combustion takes place by direct combination of the fuel with oxygen. For example, the glowing combustion of charcoal or charred wood remaining after the combustible gases have been burned.

Another important factor involved in the ignition of a substance is the size or mass of the substance to be heated. A wood shaving presenting a small mass for heating will ignite more quickly than the block of wood from which it was cut. It is necessary that a solid must first be heated sufficiently to cause it to change into a combustible gas before it will ignite.

Flammable liquids are divided into three classes. Class I includes those having flash points below 100°F. Class II includes those having flash points at or above 100°F, but below 140°F. Class III includes those having flash points at or above 140°F, but below 200°F.

Flash point, the commonly accepted criterion of the relative hazard of flammable liquids, is by no means the only factor in evaluating the hazard. The ignition temperature, explosive range, rate of evaporation, specific gravity, and rate of diffusion of the vapor also have an important bearing. The flash point and other factors which determine the relative susceptibility of a flammable liquid to ignition have comparatively little influence on its burning characteristics after the fire has burned long enough so that the liquid is thoroughly heated.

Liquid fuels have physical properties that increase the difficulty of extinguishment and generally require the use of special extinguishing agents, i.e., foam, dry chemical, carbon dioxide, etc.

The action of gases is subject to the vapor density of the particular substance, those that are less dense than air will tend to rise and dissipate. However, if the gas is heavier than air, it will tend to hug the ground and travel as directed by terrain and wind.

Another aspect associated with gases is the gas/air mixture. For combustion this mixture must be within the flammable range and raised to its ignition temperature.

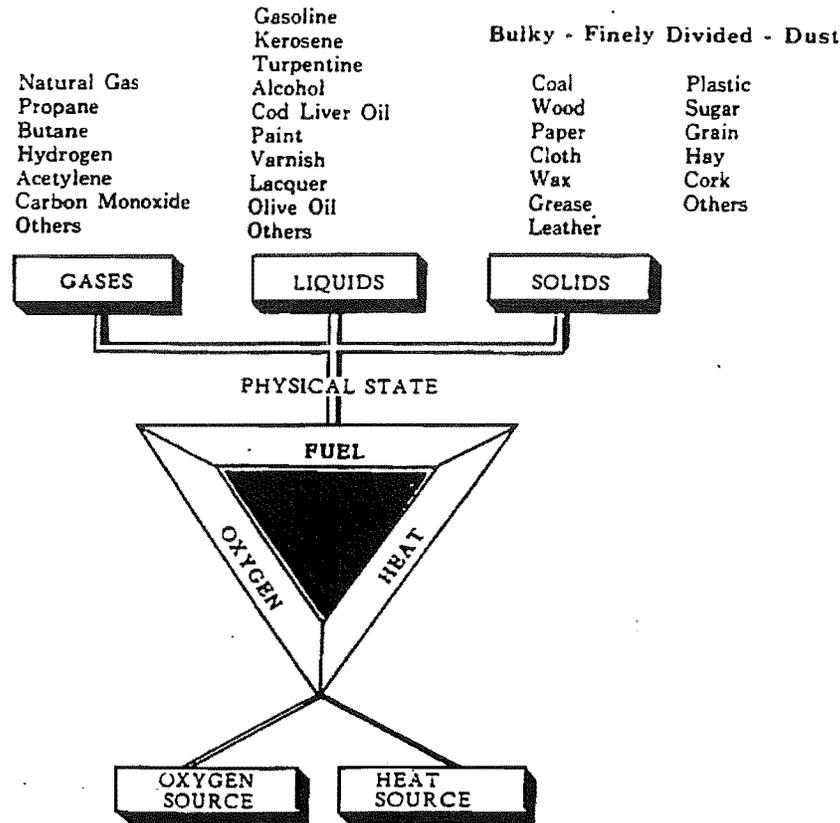
Flammable metals may supply their own oxygen, such as sodium nitrate and potassium chlorate, and can burn in an oxygen-free atmosphere. Magnesium has a burning temperature of 2500°F. If water is used as the extinguishing agent, the application rate must exceed the decomposition rate before the fire will be extinguished.

EXAMPLES OF FLAMMABLE RANGES

Fuel	Lower Limit	Upper Limit
Gasoline Vapor	1.4	7.6
Natural Gas (Methane)	5.0	17.0
Propane	2.2	9.5
Carbon Monoxide	12.5	72.0
Acetylene	2.5	100.0
Hydrogen	4.0	75.0
Hydrogen Sulfide	4.3	45.0

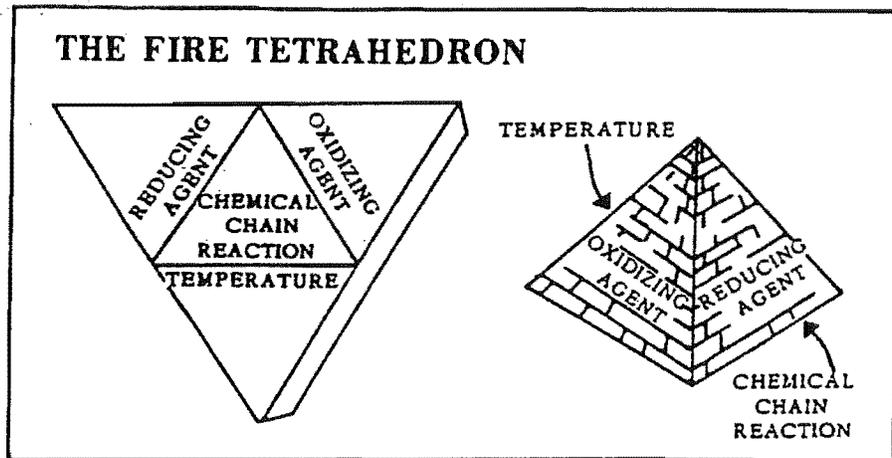
THE BURNING PROCESS

The combining of the three necessary components of fuel, heat, and oxygen for combustion has been characterized as the fire triangle. However, the actual process which occurs during the active flaming mode of combustion incorporates the additional component of an uninhibited chemical chain reaction. When this chain reaction is combined with the three other components of fuel, heat, and oxygen, it is represented by the fire tetrahedron - a four sided figure resembling a pyramid. When a fuel is combined with a heat source at a temperature above the ignition point of the substance and in the presence of oxygen, combustion will occur. This burning process will continue as long as enough heat is present to produce fuel vapors that will combine with oxygen and maintain combustion.



Approximately 16% Required
 Normal air contains 21% O₂
 Some fuel materials contain sufficient oxygen within their make-up to support burning.

To Reach Ignition Temperature
 Open flame — The Sun
 Hot Surfaces
 Sparks and Arcs
 Friction — Chemical Action
 Electrical Energy
 Compression of Gases

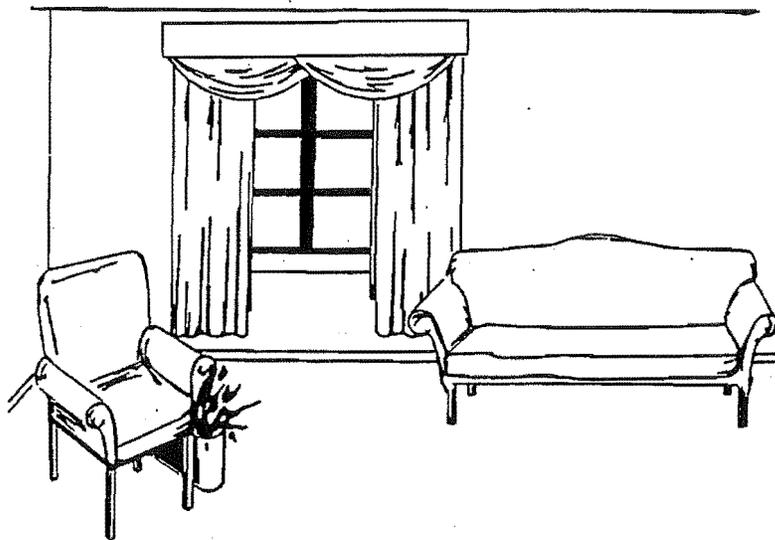


STAGES OF FIRE

Everyone must fully understand each stage associated with the development of a fire. This knowledge is vital so that proper extinguishing and ventilation techniques may be employed and for the safety of the personnel involved in combatting a blaze. All fires begin at the incipient level and can progress through the free-burning stage. At this point the next phase is dependent upon a continuing oxygen supply. With oxygen, the fire may progress to a flashover condition; or with a reduced oxygen level, the fire will reduce to the smoldering phase which can ultimately develop into a backdraft condition.

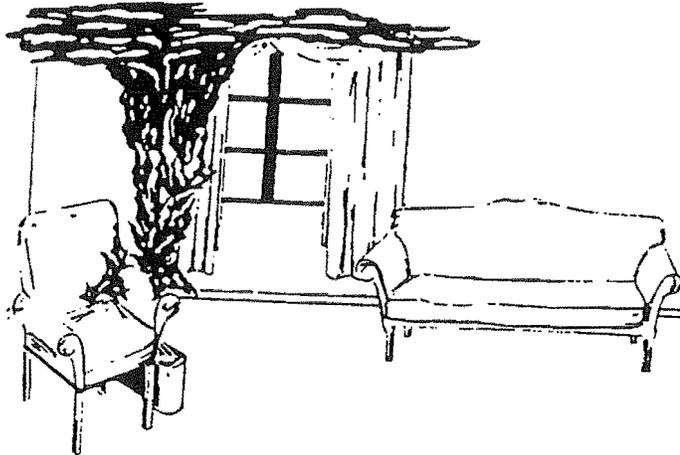
INCIPIENT PHASE

During the first stage, fire within a building will normally be free burning because of an available supply of oxygen and will produce carbon dioxide, water vapor, a small amount of sulphur dioxide and carbon monoxide. Heat will be at a flame temperature of 1200 degrees plus; however, the room temperature may be only slightly above 100°F.



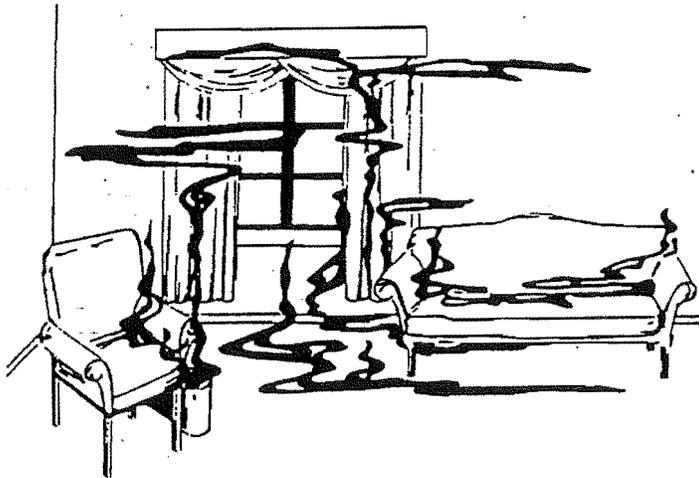
FREE-BURNING PHASE

During the second stage, the oxygen is drawn into the fire as the heated gases rise and carry the heat to the highest level of the confined area. Once the heated gases reach the top, they begin to spread out in a downward layering fashion and force the cooler air to seek lower levels. As this layering action continues, the superheated gases which can exceed 1300°F will ignite any combustibles. The stage to which the fire will progress is dependent upon the quantity of available oxygen - either flashover or backdraft.



SMOLDERING PHASE

During the smoldering stage, fire is barely visible, oxygen supply is reduced to 15%, and smoke is dense. More carbon monoxide and combustible gases are being produced, and room temperature is rising in many instances to over 1000°F.



FLASHOVER CONDITION

Flashover occurs when a room or other area becomes heated to the point where flames flash over the entire surface or area. Originally, it was believed that flashover was caused by combustible gases released during the early stages of the fire. It was thought that these gases collected at the ceiling level and mixed with air until they reached their flammable range, then suddenly ignited causing flashover.

It is now believed that while this may occur, it precedes flashover. The cause of flashover is not attributed to the excessive build up of heat from the fire itself. As the fire continues to burn, all the contents of the fire area are gradually heated to their ignition temperatures. When they reach this point, simultaneous ignition occurs and the area becomes fully involved in fire.

BACKDRAFT CONDITION

The fire conditions are high concentrations of flammable gases and heat; the only element missing is oxygen.

The fourth stage exhibits the following characteristics; oxygen supply reduced to 13%, no flame, room temperature in excess of 1200°F, dense smoke and more carbon monoxide. Intense heat will have caused combustibles in the room to vaporize and give off fuel gases adding to the hazard. At this point, a building contains combustible fuels and toxic gases at temperatures in excess of most ignition temperatures. The only factor missing is a sufficient supply of oxygen. Gases, when heated, will expand and rise. If the building is opened at a lower level allowing a supply of oxygen to enter and mix with the superheated vapors including carbon monoxide, an explosion will occur.

In this situation, two avenues of action can be followed and good judgment has to be used in either approach. As long as the building is not opened, the fire will be contained unless the pressure buildup is too great resulting in a pressure explosion (blowing out windows, etc.). Do not open any part of the building until ample hose lines have been laid to points of entrance. The building can be opened at the highest level (roof, over stairway, etc.) allowing heated gases and smoke to escape to the outside, thus disposing of a large amount of fuel and toxic gases. Two combustion factors will be removed by this action: fuel and heat. Fire fighters may enter at the lower levels and extinguish the fire without fear of an explosion caused by the admission of a new supply of oxygen.

Fire fighters may use a second approach depending upon the area of the building involved. If, for example, two or three rooms on the first floor of a building are involved and the fire is contained and in the fourth stage, fog streams may be used in the following manner: hoselines must be charged and the fog pattern adjusted so the water can be applied through a window or door. The fire fighter should stand

back 15 to 20 feet and break open a door or a window with a pike pole. Water should be applied immediately. When the building is opened, the application of water will absorb the heat before a new supply of oxygen is admitted and eliminate the explosion hazard. The pressure increase created by the conversion of the water will ventilate the building.

Carbon monoxide, a highly explosive gas, has an ignition temperature of 1204°F, and a wide explosive range of 12.5 to 72%. A mixture of carbon monoxide does not require much additional oxygen to ignite or explode.

Several warning signs may indicate a possible backdraft condition. One indication of smoke under pressure, many times leaving the upper areas of the structure in puffs. When an opening is made at a lower level, sudden rapid inward movement of smoke or air may be observed. This black smoke may become dense and gray-yellow. The windows will become heavily smoke stained and there will be little or no visible flame. Personnel within the structure may encounter a confined feeling while experiencing excessive heat conditions. Hearing levels may be reduced to muffled sounds.

PRODUCTS OF COMBUSTION

When a substance burns, there are four products of combustion: heat, flame, flammable gases and smoke. As this substance is burning, a chemical change occurs. While all of the elements are being transformed into another form or state during the combustion cycle, none are destroyed in the process. Flame is the visible, luminous body of a burning gas and is considered to be a product of combustion. The other products can develop without visible flame, such as a smoldering fire situation. Heat is the form of energy produced as a result of combustion. The method to determine the intensity is measured in degrees of temperature. Smoke is always the result of incomplete combustion. When compounds such as coal, wood, fats and petroleum burn, the heat of the fire expels hydrogen and oxygen along with carbon and these burn as gases. As they burn, they do not meet with sufficient oxygen, and also, they are cooled. The hydrogen in these gaseous combinations burns more quickly than the other gases; therefore, some unburned carbon is liberated as soot and carbon monoxide. This is called smoke.

TRANSFER OF HEAT

Heat can travel throughout a burning building by one or more of three methods, commonly referred to as conduction, convection, and radiation. Since the existence of heat within a substance is caused by molecular action, the greater the molecular activity, the more intense the heat. A number of natural laws of physics are involved in the transmission of heat. One is called the Law of Heat Flow; it specifies that heat tends to flow from a hot substance to a cold substance. The colder of two bodies in contact will absorb heat until both objects are the same temperature.

CONDUCTION

Conduction is the process of heat transmission within a solid material to another with which there is direct contact. To illustrate: If a 1/4 inch iron rod is held in a flame, the other end of the rod will, within a very short time, become too hot to hold in the hand. For this same reason, it is possible for a fire to extend to the opposite side of a brick wall by conduction of heat from the original fire. Steel I beams, iron doors, and other metal materials will, at times, allow fires to extend to other areas through conduction of heat which ignites combustible materials in these areas. The possibility of fires extending by conduction is the principle reason why building codes require open air space between heating devices and combustible materials.

RADIATION

Heat radiation is the transmission of heat from one material to another by heat waves or rays. The heat waves travel through space in a straight line away from the heat-producing object. The most common example of this type of heat is that produced by the sun. These heat waves are constantly passing into space as radiant energy.

This radiant energy becomes heat only when it is absorbed by material which it strikes. These heat waves or rays, which are produced by hot objects, are generally referred to as radiant heat.

Not all materials equally absorb radiant heat. Some, because of their condition, reflect this heat. A light colored material will reflect radiant heat, while a dark color will absorb it. The most common source of radiant heat is the sun. While exposed to the direct rays from the sun, an object will receive the full strength of its radiant heat. If it is placed in the shade, it will be shielded and whatever object has furnished the shade

will either absorb or reflect the direct rays and give protection to the shaded object. This same principle applies to the spreading of fires by radiation. Whenever combustible material is exposed to the direct rays from a fire, the radiant energy passes from the fire to the material, and when the material reaches its "burning temperature," it will burst into flame.

CONVECTION

The process by which heat is transferred through the movement of air, vapors, or liquid is called convection and is considered one of the most significant methods of fire travel. When any of the above substances are heated, they expand, grow lighter, and move upward. One example would be the heating of air during a structure fire. As the air is heated, it expands, grows lighter, and moves into the upper most accessible building areas while being replaced by cooler air. Another form of convection exists whenever an object is heated by direct flame contact. As the flame application continues, the substance is heated to the point where flammable vapors are released and subsequently ignited.

CLASSIFICATION OF FIRES

To enable us to select the proper extinguishing agent, fires are placed in four classifications: Class A, Class B, Class C and Class D.

Class A fires involve solid fuels and are normally extinguished by using water to absorb heat and reduce the temperature below the ignition point.

Class B fires involve flammable liquids, petroleum products, etc., and are normally extinguished by using a smothering agent (excludes oxygen): foam, dry chemical, CO₂ or by proper application of fog streams to absorb heat.

Class C fires involve electrical equipment and are extinguished by using a nonconducting extinguishing agent - CO₂ and dry chemical or by using water in the form of fog or a broken stream. Electrical equipment should always be de-energized if possible.

Class D is a fire classification involving pyrophoric liquid metals - sodium and potassium, referred to as NAK. NAK reacts violently with water, CO₂ carbon tetrachloride, dry chemical, and foam. Never use these agents. An extinguishing agent such as Metal X (impregnated sodium chloride) is effective as is soda ash and graphite powder.

DEFINITION OF TERMS

A knowledge of fire service terminology is vital to conducting safe and efficient fire control operations. The following are some of the more important common terms that fire service personnel must thoroughly understand.

AUTO IGNITION TEMPERATURE. The temperature at which a mixture of flammable vapors and air will ignite without flame or spark. Also, it is the temperature an ignition source must possess to ignite a given mixture of flammable vapors.

BOILING POINT. The temperature of a liquid at which its vapor pressure equals atmospheric pressure. If the boiling point temperature is sustained, a substance under atmospheric pressure cannot remain in liquid state but must vaporize.

BRITISH THERMAL UNIT (BTU). The quantity of heat that is required to raise the temperature of one pound of water one degree Fahrenheit. BTU is a measure of heat quantity. Temperature, on the other hand, is a measure of heat intensity.

BURNING (Also called COMBUSTION and FIRE). A rapid oxidation chemical reaction that produces heat and light.

CATALYST (Also called CATALYTIC AGENT). A substance that causes or accelerates a chemical reaction but that does not itself enter into the reaction or undergo permanent change.

CHEMICAL CHANGE. A change in a substance that alters chemical and sometimes physical properties. For example, when carbon (C), which is a solid, burns, it changes to carbon dioxide (CO₂), a gas.

CLASSIFICATION OF FIRES

Class A Fire - Involves ordinary combustible material, wood, paper, vegetation, fabrics, and so forth.

Class B Fire - Involves flammable or combustible liquids.

Class C Fire - Involves (1) Class A, B, or D materials; and (2) charged electrical equipment or wiring.

Class D Fire - Involves combustible metals such as sodium, magnesium, and titanium.

COMPOUND. A molecule that consists of two or more elements that are chemically united.

CONDUCTION. The transfer of heat within a substance with no visible motion in the substance: transfer of heat by molecular contact.

CONFLAGRATION. A fire that crosses natural or prepared barriers such as streets, fire walls and firebreaks, and extends over considerable area to cause extensive damage to buildings, vegetation, and property.

CONVECTION. The transfer of heat by motion of heated gaseous or liquid matter.

CRYOGENICS. The science of materials at temperatures below -150°F . This term is used to categorize liquid oxygen, hydrogen, nitrogen, and argon as materials that require special fire department operations.

ELEMENT. A molecule composed of atoms of the same kind.

ENDOTHERMIC. A chemical reaction in which the involved substances take in heat.

EXOTHERMIC. A chemical reaction in which the involved substances give off heat. This is the most common type of chemical reaction.

EXPLOSIVE RANGE (also called FLAMMABLE RANGE). The percentages in the atmosphere of a flammable or combustible vapor that is neither too lean nor too rich to burn: those concentrations (percentages) of vapor between the lower explosive limit (LEL) and the upper explosive limit (UEL). Gasoline, for example, with an LEL of 1.4 percent and a UEL of 7.6 percent, has a flammable range of 1.4 to 7.6 percent. Concentrations of less than 1.4 percent gasoline vapors in air are too lean to burn and concentrations over 7.6 percent are too rich to burn.

FIRE CHEMISTRY. The study of matter and energy as they relate to the prevention and control of fires.

FIRE POINT. The temperature to which a flammable liquid must be heated to produce a sufficient quantity of vapors to burn continuously. Fire point is usually a few degrees above the flash point of a liquid.

FIREPROOF. Since no material is completely immune to the effects of fire, this is a term that should not be used by fire service personnel to describe materials or structures.

FIRE RESISTIVE. A structure or an assembly of materials that will resist the effects of fire for a predetermined length of time. The effects of a material's exposure to fire may include burning, distortion, collapse, and transfer of heat.

FIRE RETARDANT. A substance or a specially prepared substance that retards the spread of fire.

FLAMMABLE. A substance capable of igniting easily and burning at ordinary temperatures.

FLAMMABLE LIQUIDS. According to the National Fire Protection Association, flammable and combustible liquids are classified as follows:

Flammable Liquids

- Class I - Liquids with a flash point below 100°F.
- Class IA - Liquids with a flash point below 73°F and a boiling point below 100°F.
- Class IB - Liquids with a flash point below 73°F and a boiling point at or above 100°F.
- Class IC - Liquids with a flash point at or above 73°F and below 100°F.

Combustible Liquids

- Class II - Liquids with a flash point at or above 100°F and below 140°F.
- Class III - Liquids with a flash point at or above 140°F.
- Class IIIA - Liquids with a flash point at or above 140°F and below 200°F.
- Class IIIB - Liquids with a flash point at or above 200°F.

FLASH POINT. The lowest temperature at which a liquid will "flash" upon the application of a flame or spark. This flash will be momentary and will then cease because the vapors burn off. Flash point is a measure of a liquid's ability to vaporize and, therefore, to change into proper form to burn.

GAS. A substance that is in vapor form at standard temperatures and pressures and that is capable of filling any container in which it is placed.

HEAT CAPACITY (also called THERMAL CAPACITY). The ability of a substance to absorb heat. Water has the highest thermal capacity of most common substances.

HEAT OF FUSION. The quantity of heat (BTU's) absorbed by a substance when it changes from a solid to a liquid.

HEAT OF VAPORIZATION. The quantity of heat (BTU's) absorbed by a substance when it changes from a liquid to a vapor.

IGNITION TEMPERATURE. The temperature to which a substance must be heated to initiate self-sustained combustion (burning). The temperatures of all common heat sources far exceed the ignition temperatures of most materials involved in fire fighting operations. The ignition temperatures of substances are therefore very important in fire prevention.

LIGHT ENDS. A term used to describe petroleum products that have relatively low flash points and high vapor pressures.

LIQUEFIED PETROLEUM GAS (LPG). A term describing a family of gases (principally butane and propane) that can be liquefied under moderate pressures. LPG's create a unique fire problem because of their liquid-to-gas expansion rates and their vapor density characteristics.

LIQUID. A substance that is in fluid form and that will take the shape of any container in which it is placed.

MELTING POINT. The temperature at which a solid will change to a liquid.

MISCIBILITY. The capacity for being mixed.

OXIDATION. The process of combining oxygen (or an oxygen substitute) with another substance.

OXIDES. Compounds that are made of oxygen and some other substance, e.g., carbon monoxide, sulfur dioxide, and nitrogen tetroxide.

RADIATION. The transfer of heat by rays or waves similar to light rays.

SOLID. A substance that does not perceptibly change its shape under normal conditions.

SPECIFIC GRAVITY. A system of measurement that compares the weight of a liquid or solid with water, with water having a value of 1. Specific gravity is an important consideration when dealing with flammable liquid fires because most flammable liquids have specific gravities less than 1; they therefore float on water.

SPONTANEOUS HEATING AND IGNITION. Self-ignition caused by oxidation of organic (animal and vegetable) materials. Mineral substances such as sulfur products do not by themselves heat spontaneously.

TEMPERATURE. A measure of heat intensity.

VAPOR DENSITY. A system of measurement in which the weight of a gas is compared with the weight of air, with air having a value of 1. All flammable liquid vapors and some flammable gases have vapor densities greater than one; they therefore settle to the ground and create special fire control problems.

VAPOR PRESSURE. The pressure exerted by a liquid vaporizing in a closed container. This pressure varies with different liquids and is dependent on temperature.

VISCOSITY. The flow resistance of a liquid. Viscosity changes in direct proportion to the temperature of a liquid.

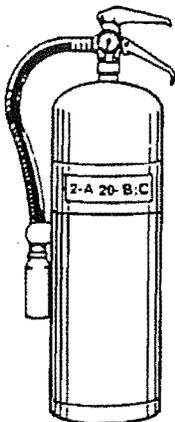
INTRODUCTION

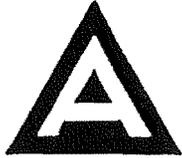
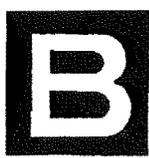
A basic knowledge of the operation and proper use of portable fire extinguishers is important to all members of the fire service. Business and industrial occupants provide fire extinguishers as the initial defense against fires. Fire Service personnel are expected to speak with authority when faced with inquiries pertaining to portable fire extinguishers. In addition, first aid fire fighting appliances should be carried on all fire apparatus. It is essential that all fire fighting personnel possess a knowledge of portable extinguishers, both in their limitations and their methods of operation.

A portable fire extinguisher is designed to permit the discharge of a limited amount of fire extinguishing agent, under the direction of the operator. The instruction panel affixed to the front of the extinguisher tells how it should be operated, and the "Class" of the fire against which it is most effective. All types of extinguishers should be recharged immediately after use, regardless of the portion of extinguishing agent expelled.

METHODS OF EXTINGUISHMENT

To be proficient at extinguishing fires, a fire fighter needs to know what is taking place when an extinguishing agent is applied to a fire. The fire fighter must be familiar with the theory of the "fire triangle" as it applies to fire suppression. This theory involves three basic methods of extinguishment: (1) removal of fuel, (2) exclusion of oxygen, (3) reduction of temperature. The recent introduction of a fourth suppression measure must be considered: inhibition of the chain reaction. Regardless of which method of extinguishment is used, the size and type of fuel involved is the prime consideration when selecting a fire extinguisher. Selecting the proper type of extinguisher depends on what effect the agent will have on the fire.



ORDINARY  COMBUSTIBLES (GREEN TRIANGLE)	FLAMMABLE  LIQUIDS (RED SQUARE)	ELECTRICAL  EQUIPMENT (BLUE CIRCLE)	COMBUSTIBLE  METALS (YELLOW STAR)
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REMOVAL OF FUEL

Although it is not always possible or practical, removal of fuel is a very effective method of extinguishment. This can be accomplished by various means, such as turning off the fuel supply, pumping flammable liquids from a burning tank, or removing unburned portions of large piles of solid combustibles, such as that found in silos or coal piles. Removal of fuel can also be accomplished by diluting burning liquids. Water can be used to dilute any material which is soluble in water. Flammable liquids which are not water soluble can be diluted with an emulsifying agent which mixes with the flammable liquid to stop the vaporization. Flammable gases can also be diluted with the addition of an inert gas such as carbon dioxide or nitrogen.

EXCLUSION OF OXYGEN

This process sometimes known as "smothering", simply extinguishes fires by separating the oxygen from the other essentials that sustain a fire. The most common example of this method is extinguishing a grease fire in a frying pan by placing the cover on the pan. Smothering is generally an easy method of extinguishment, but may be ineffective on some plastics and some metals, which do not depend on an external air supply. These materials often generate their own oxygen supply, and when these conditions are encountered, other methods of extinguishment or control are required.

REDUCTION OF TEMPERATURE

One of the most effective methods of extinguishment is cooling or quenching. This process involves application of an agent which will absorb heat from the fire at a very high rate. This heat absorption results in a cooling of a fuel to a point at which it ceases to release enough vapor to maintain the combustion. Heat is also being carried away from a fire by conduction, convection, and radiation. Of all the known extinguishing agents, water absorbs more heat per volume than any other agent.

INHIBITION OF CHAIN REACTION

In recent years, scientists have determined that certain chain reactions take place in the combustion process. This chain reaction occurs as a result of the simultaneous formation and consumption of certain atoms which produce the flame. Other chemical substances have been identified as having the ability to break up this reaction. When these chemicals are introduced in the proper amounts, they inhibit the atoms which the

the flame needs to keep burning. Without the reaction between these atoms, the flame cannot continue to burn and the fire is extinguished. As a result of these discoveries, many new extinguishing agents have emerged and are being used extensively in fire extinguishers.

CLASSIFICATION OF FIRES

Class A involves ordinary combustible materials such as wood, paper, cloth, etc. Extinguishment is accomplished by the cooling and quenching effect of water or by the coating effects of certain dry chemicals which retard combustion.

Class B involves flammable liquids, gases, and greases. Smothering and blanketing agents or those that provide a chain breaking action in the combustion process are the most effective.

Class C involves energized electrical appliances and machinery. This type requires nonconductivity of the extinguishing agent.

Class D involves certain combustible metals and contains a heat-absorbing medium not reactive with the burning metals.

EXTINGUISHER CLASSIFICATION SYMBOLS

Extinguishers will bear symbols containing different shapes, colors, and letters that indicate what class of fire on which it will be effective. These classification symbols have been in use for some time and most people are familiar with their use and meaning.

Recently, a "picture-symbol" labeling system has been designed and approved for use. The purpose of this new system is to make the operation of fire extinguishers more effective and safer by using these less confusing picture labels. This system indicates the type of fire on which the extinguisher can be used through the use of picture-symbols. These picture-symbols illustrate Class A, B, and C fires on a label with a light blue background. If the extinguisher is not to be used on a certain class fire, the symbol background will be colored black with a red diagonal line drawn through it.



"PICTURE-SYMBOL" FOR EXTINGUISHER SUITABLE ON CLASS B AND C FIRES BUT NOT CLASS A



EXTINGUISHER WITH THIS LABEL IS SUITABLE FOR CLASS A FIRES, BUT NOT SUITABLE FOR CLASS B AND C FIRES



LABEL FOR EXTINGUISHER SUITABLE FOR CLASS A AND B FIRES, BUT NOT FOR ELECTRICAL FIRES

This is the universal symbol for "NO". In addition, the regular letters and symbols for the classification of fire are printed above each picture-symbol along with the supplemental words to help recall the meaning of the letters. These picture-symbols will not be found on all extinguishers but their use is continuing to increase.

EXTINGUISHER RATING SYSTEMS

Ratings for Class A and Class B extinguishers are determined by reproducible physical tests conducted by Underwriters Laboratories, Inc. These tests provide a guide to extinguishing potential for each size and type of extinguisher tested.

For fire extinguishers classified as Class A units, three different tests must be conducted. Each of these tests must be conducted using a fully charged extinguisher. The three tests are:

- o Wood crib test
- o Wood panel test
- o Excelsior test

Each of these tests involves Class A materials, but each presents a different type of extinguishing situation. Further information on these specific tests can be found in U.L. Standard 711, "Ratings and Fire Testing of Fire Extinguishers", available from Underwriters Laboratories, Inc.

Extinguishers classified as Class B are rated according to their ability to extinguish flammable liquid fires. In these fire tests, the relative extinguishing effectiveness is determined by the number of square feet of fire which can be extinguished. Since Underwriters Laboratories uses experienced operators when conducting these tests, a safety factor is built into the actual rating assigned to a specific extinguisher. This safety factor usually reduces the rating to approximately 40% of the rating an expert operator would obtain. For example, if an expert operator can extinguish a flammable liquid fire in a pan covering an area of 100 square feet, the extinguisher used would only be given a rating of 40-B. This allowance should be more than adequate for even the most inexperienced operator. In determining proper coverage requirements for a Class B hazard, one unit of protection for each square foot of flammable liquid surface area is the absolute minimum. If the depth of the surface area of the flammable liquid is greater than 1/4 inch, NFPA 10 requires two units of protection per square foot.

Class C extinguishers are not assigned a numerical rating since they are classified solely on the basis of their being nonconductive of electricity. The primary purpose of the test is to insure that neither the agent nor the nozzle or horn are conductive. However, since most Class C fires are essentially either a Class A or Class B fire involving energized electrical equipment, an extinguisher rated Class C must also carry either a Class A or Class B rating.

The specific quantities and types of agent vary with the type of combustible metal to be protected and therefore no numerical rating has been established for Class D extinguishers. The effectiveness of the extinguisher on Class D fires is detailed on the nameplate of the particular extinguisher.

TYPES AND OPERATION OF EXTINGUISHERS

WATER BASED

Currently two basic designs of water-based fire extinguishers are approved for use: (1) the stored-pressure and (2) the pump tank. Of these two designs, the most common is the stored-pressure. This extinguisher is available in various sizes; the most popular is the 2½ gallon. In these extinguishers the water is stored under air pressure of approximately 100 pounds per square inch. A visual check of the pressure gauge should indicate operability of the extinguisher.

This extinguisher is operated in an upright position. The discharge valve is opened by removing a locking pin and squeezing the handle grip. The air pressure stored within the cylinder will expel the water to a distance of 30 to 40 feet. By releasing or squeezing the grip, the operator can control the amount of water being discharged. Normally, the time required to empty the extinguisher will be 60 seconds if the discharge valve is held entirely open.

When the extinguisher is used to provide protection in areas subject to freezing temperatures, an approved fire extinguisher anti-freeze should be used or the extinguisher should be mounted in a cabinet heated to 40°F.

The term "loaded stream" refers to an anti-freeze water solution containing an alkali metal salt. Its effect on a Class A fire is different than that of plain water in that the flame is extinguished more rapidly and flashback is significantly retarded. Pressurized water and loaded stream extinguishers have a 2A rating. They should be hydrostatically tested every five years. Those containing a loaded stream type of agent should be subjected to an annual maintenance program in which they are completely disassembled. Prior to disassembly, the extinguisher should be fully discharged to check the operation of the discharge valve and pressure gauge.

Of the two types of pump tank extinguishers, the back is the one with which fire fighting personnel are most familiar. As the name implies, it is designed to be carried on the operator's back and is primarily used for fighting outdoor brush and grass fires. It contains 5 gallons of water and weighs approximately 50 pounds when full. Discharge of water is through a short length of rubber hose which has a trombone-like, double action piston pump attached to its end. To operate the pump, the operator holds the stationary end of the device with one hand while sliding the piston back and forth with the other hand.

CARBON DIOXIDE (CO₂)

CO₂ extinguishers are high-pressure cylinders available in a variety of sizes, ranging from 2¼ to 20 pounds in portable units and up to 100 pounds in wheeled type units. They are effective on both Class B and Class C fires.

The capacity of this type extinguisher is determined by the weight of the CO₂ it will hold. When sorted under pressure, the CO₂ is in a liquid state. The cylinder pressure, at normal room temperature, remains in the 800 to 900 psi range, whether the unit is

completely or only partially full. Weighing is the only method of determining the amount of agent remaining in the extinguisher. As the gas leaves the container, it expands at a ratio of 450 to 1.

These extinguishers are carried and used in an upright position. When the locking pin has been removed, squeezing the carrying-discharge handle will cause the CO₂ to be expelled in the form of a white cloud of gas and snow (dry ice).

The CO₂ is one and one half times heavier than air and therefore settles over the burning liquid, displacing the oxygen and smothering the fire. It is directed at the fire by a funnel-shaped discharge horn made of a nonconductive material.

The principal advantage of a CO₂ extinguisher is that the agent does not leave a residue after use. This may be a significant factor where protection is needed for delicate and costly electronic equipment, areas containing food processing operations, laboratories, and other places where contamination would present a problem. Since the agent is discharged in the form of a gas-snow cloud, it has a relatively short range of three to eight feet. Because the agent would rapidly dissipate and be ineffective, this type of extinguisher is not recommended for outdoor use where windy conditions prevail, or for indoor use in locations which are subject to strong air currents.

Carbon dioxide fire extinguishers should be refilled when used or when the extinguishing agent is 10% below its full weight and should be hydrostatically tested every five years.

CAUTION: DO NOT handle the snow produced by the extinguisher. It may cause frostbite. When using this extinguisher in an unventilated or confined space the user should avoid inhaling the gas because it displaces the oxygen in the atmosphere and causes asphyxiation. This type of extinguisher need not be protected from freezing.

DRY CHEMICAL

Approved units of dry chemical extinguishers are available in various sizes, ranging from 1 to 30 pounds. Wheeled units may be as large as 350 pounds. There are three basic types of dry chemical agents.

- o Sodium bicarbonate
- o Potassium bicarbonate (Purple K)
- o Monoammonium phosphate (all-purpose "ABC")

CAUTION: These chemicals should NOT be confused with dry powder extinguishers designed for use on Class D fires.

These three agents are available in two styles of extinguishers. The first type is one in which the dry chemical is under pressure produced by nitrogen or dry compressed air. The other type has a CO₂ or nitrogen cartridge which is utilized to pressurize the unit when it is to be used.

Both types of extinguishers are carried and operated in the upright position. Release of the dry chemical in the constantly pressurized type (identified by a pressure gauge on the top) is controlled by removing the locking pin and squeezing the carrying-discharge handle. In the cartridge-pressurized type, in addition to removing the locking pin, the discharge hose, which is stored between the puncture lever and the extinguisher body, must be removed before the lever marked "PUSH" can be activated.

Once the puncture lever pierces the cartridge seal, the gas pressurizes the cylinder chamber and the dry chemical may be expelled by operating the squeeze valve at the end of the hose.

CAUTION: Never stand so that any part of the body is directly above the top of the extinguisher when the cartridge puncture lever is activated. The sudden pressure surge could blow the top off the extinguisher if it is not secured properly.

When sprayed directly on the fire, dry chemical extinguishes the flame at once. Smothering and cooling contribute to the extinguishing action, but the chain-breaking reaction in the flame is the principle cause of extinguishment.

Both sodium base and Purple K are effective on Class B and C fires. Monoammonium phosphate base dry chemical is effective on Class A, B, and C fires. When applied to Class B or C fires, it extinguishes in a manner similar to the other dry chemicals, but when applied to Class A fires it has the ability to adhere to surfaces and form a coating which tends to retard further combustion.

Dry chemical extinguishers have a high velocity nozzle and may cause splashing of a burning liquid, if discharged into the liquid from closer than eight feet. The normal range of the various sizes is from 5 to 20 feet. The time required to discharge the agent is from 10 to 25 seconds depending on the capacity of the unit. It need not be protected from freezing.

After using one of these extinguishers, take it to an open area, invert the cylinder, and operate the squeeze valve to expel the chemical from the hose. This will prevent it from caking in the hose line.

Stored pressure dry chemical extinguishers are required to be hydrostatically tested every 12 years and approved maintenance must be performed every six years.

AQUEOUS FILM FORMING FOAM (AFFF)

AFFF type extinguishers are rated for use on both Class A and Class B fires. They are not suitable for use in freezing temperatures. An advantage of this type of extinguisher is its ability to coat the liquid surface when used on flammable liquid fires of appreciable depth. This helps to prevent reignition.

This type extinguisher is available in a 2½ gallon model with a rating of 3-A:20-B.

The extinguishing agent in AFFF type of extinguishers shall be replaced at least once every five years and a hydrostatic test should be performed within five years from last test.

BROMOCHLORODIFLUOROMETHANE (Halon 1211)

Halon 1211 extinguishers have an agent that is similar to CO₂ in that it is suitable for cold weather installations and leaves no residue. Some Halon 1211 extinguishers are listed for use on Class A, as well as Class B and C fires. Compared to CO₂ on a weight-of-agent basis, Halon 1211 is at least twice as effective. When discharged, the agent is in the combined form of a gas/mist with about twice the range of a CO₂ extinguisher. To some extent, windy conditions or strong air currents may make extinguishment difficult by causing the rapid dispersal of the agent.

Stored pressure extinguishers of this type are available in capacities of 2 to 22 pounds which have fire extinguishment ratings from 23-B:C to 4-A:80-B:C. Discharge range is from 9 to 15 feet.

Halon 1211 extinguishers contain an extinguishing agent whose vapor has a low toxicity. However, its decomposition products can be hazardous. When using these extinguishers in unvented places such as small rooms, closets, motor vehicles, or other confined spaces, operators and others should avoid breathing the gases produced by

thermal decomposition of the agent. Stored pressure Halon 1211 extinguishers are required to be hydrostatically tested every 12 years and approved maintenance must be performed every six years.

DRY POWDER

The Class D extinguisher described in this section is rare. A few industrial establishments still have them, but most requirements for Class D agents are fulfilled by having dry powder in metal drums which is applied with scoops or shovels. In spite of the scarcity in numbers, the fire fighter on inspection will encounter them and is expected to be familiar with their class of protection and their operation.

This type of extinguisher is available in a 30 pound unit. The method for operating the extinguisher is similar to that of the dry chemical extinguisher. A variety of materials is used in this type of extinguisher; most of them are free-flowing graphite-like powder.

A carbon dioxide cartridge provides the pressure to expel the powder over the burning metal. As a thick layer of powder builds up over the metal, the heat of the fire causes the powder to cake, forming a crust that excludes air which causes extinguishment. The range of this type extinguisher is 5 to 20 feet. It need not be protected from freezing.

Although prohibited for sale by many codes, substandard extinguishers appear from time to time. Among the common types are: aerosol vaporizing liquid "Beer Can," glass bulb "Grenades," and chemical shaker units. These units, which have no approval from testing laboratories, are too small to provide any protection. In addition, they tend to engender a false sense of security on the part of those relying on them for protection.

OBSOLETE EXTINGUISHERS

In 1969, the manufacture of all inverting type extinguishers was discontinued in the United States. Included in this list are soda-acid, foam, and cartridge-operated water extinguishers. Fire fighters encountering one of these types of extinguishers should advise the owner or operator of the fact that the extinguisher is obsolete and could be potentially dangerous to operate.

AUTOMATIC SPRINKLERS

Automatic sprinkler systems have been used to protect lives and property in commercial and industrial buildings for more than a century. Following a series of devastating fires more than 100 years ago, the textile mills of New England were the first to use sprinkler systems. Since then, sprinkler systems have been used widely in stores, office buildings, schools, factories and warehouses. Originally introduced to protect property, sprinkler systems also have been adopted widely for life-safety in hospitals, nursing homes, hotels and apartment buildings. Today, sprinklers also protect flammable liquid storage areas, computer rooms, dwelling units, and even ocean liners. Since the 1800's, many improvements and refinements have been made to the sprinkler and its method of operation, but the basic principle of its operation remains the same -- the automatic application of an adequate amount of water where it is needed the most, early in a fire.

Public and private sector programs have been making progress to extend the type of fire protection offered by sprinkler systems to family residences. Because industrial and commercial applications of sprinklers are long established and well-proven, and because the vast majority of fire deaths and injuries occur in residences, considerable emphasis is now being placed on residential applications.

HOW SPRINKLERS WORK

In a typical industrial sprinkler system, sprinkler heads are activated by high temperatures at the ceiling level where the heads are located. Because the hot gases generated by a fire tend to rise toward the ceiling, temperatures near the ceiling become very high early in a fire's growth. In most systems high heat activates the sprinkler head by softening the solder which holds parts of a metal link that keeps the sprinkler valve closed. With the link fused, the sprinkler opens and water is discharged onto the fire, wetting and cooling the fire area to prevent further spread of the fire, reduce its intensity, and often extinguish it. Sprinkler heads are activated individually, which means that only heads over the fire area discharge water.

Industrial sprinkler systems are tailored to the needs of individual properties. Consequently, specific elements of the systems -- e.g., spacing of sprinkler heads, the number of gallons of water a sprinkler head is designed to discharge each minute after it is activated, etc. -- may vary from one type of property to another.

Residential sprinkler systems pose several special problems that traditional technology has not been designed to address. First, residential properties have smaller room sizes and lower ceilings than nonresidential properties. This means that hot gases from the fire are more confined and temperatures can rise to lethal levels faster, producing carbon monoxide and other gases. That, in turn, means that faster sensing and activating devices are needed to ensure that the occupants will not be killed or fatally injured before the sprinkler comes on.

Second, the smaller room sizes and differences in normal distribution of contents mean that the water distribution patterns – the shape of the spray typical of industrial sprinkler heads – may not be appropriate for residential properties.

Third, the water pressures and water quantities required by traditional sprinkler systems are generally not attainable in residences in many areas. The large piping required to sustain these systems results in an unacceptably high cost for a sprinkler system for the typical home.

Fourth, the public's acceptance of sprinklers in their homes is more sensitive to aesthetic considerations, a factor that can be overlooked in most industrial and many commercial applications.

Recently, a more sensitive sprinkler which activates five times faster than conventional ones has been developed. In addition to offering the increased sensitivity needed for residential applications, the new sprinkler can be used with low-cost piping and has an improved water distribution pattern which cools the air around adjacent sprinklers to reduce the possibility of activation of second and third heads. As a result of this development, an entire residential sprinkler system can be made considerably more affordable for the average new home buyer by keeping cost down to 1-2 percent of the cost of a new home.

Considerable research has gone into meeting the need for developing higher sensitivity requirements for residential sprinkler systems. One concept involves the use of Nitinol, a nickel titanium alloy which can be encoded with a "memory" of a particular shape, then molded into a different shape to hold the sprinkler closed. When the material is exposed to enough heat, it reverts to its remembered shape and opens the sprinkler. As the temperature is reduced by the sprinkler discharge, the NITINOL returns to its original shape and closes the sprinkler. The heat required is still great enough to

prevent accidental discharges but less than that required by "conventional" fusible-link devices. Another concept involves using electronic devices, e.g., thermistors, thermal resistors, transistors to sense a particular temperature threshold or rate of rise and trigger sprinkler activation.

SPRINKLER STANDARDS

Now that the initial breakthrough in residential sprinkler technology has been achieved, an effort is being made to modify existing standards and listings to incorporate the new system.

A revision of NFPA 13-D, the sprinkler performance standard, was approved by the National Fire Protection Association's 13-D Sprinkler Committee and adopted by the full NFPA membership at the organization's conference in November 1980. Underwriters Laboratories is now accepting new sprinkler hardware for testing under the new standard.

Some communities are not waiting for the adoption of new standards and hardware and have been encouraging installation of presently approved sprinkler systems in homes. As an example, the San Clemente California City Council adopted an ordinance that requires automatic sprinklers in new homes, one of the first compulsory sprinkler ordinances in the United States.

The San Clemente Ordinance declares:

"The fire loss in this country in residential occupancies is catastrophic. Manual fire fighting methods are not the answer. The only way to attack the problem is to limit the fire growth where it occurs in dwellings.

We have the technology to do that: Residential Automatic Sprinkler Systems.

This standard for low cost residential sprinkler systems is designed to meet the following performance criteria:

1. To prevent flashovers (the simultaneous ignition of all combustibles after reaching a certain temperature).
2. To protect lives and property immediately adjacent to fire room.
3. To contain the fire to room of origin.
4. To limit the number of fire personnel required to combat structural fires."

OVERALL EFFECTIVENESS OF SPRINKLERS

Evidence from several sources indicates that sprinklers have had a significant impact on reducing deaths and property loss from fire in public and institutional buildings, and there are promising indications that sprinklers also can significantly reduce fire-related deaths and property loss in homes. In addition, sprinklers "have a psychological as well as physical value in that they give a sense of security to occupants of buildings and tend to minimize possible panic hazards," according to the NFPA Fire Protection Handbook.

Although there may be differences in property values between sprinklered and unsprinklered properties, analyses of the extent of flame damage support the conclusion that fires in unsprinklered properties tend to involve more loss because they tend to spread further.

Because home sprinkler systems are very rare today and do not yet incorporate the new technology, there is no dependable fire incident data on the impact of home sprinklers on life safety. But the latest Fire Administration tests of proto-types of the new design -- in August-September 1980 in a mobile home in Charlotte (NC) -- showed life-threatening changes in environment can be minimized with sprinklers. Conditions, even in the room of origin deteriorated less, enhancing chances for survival and/or escape.

Preliminary results of a special analysis of NFIRS data by the NBS Center for Fire Research show that, combined with detectors, conventional (old technology) home sprinklers could cut death rates in dwelling fires by 50 percent, which is 14 percentage points higher than the reduction achievable with detectors alone. The Center's findings also indicate that these "old-style" sprinklers alone, without detectors, would probably reduce death rates in dwelling fires by about 31 percent. The extra life-safety potential of the new technology sprinklers has not been estimated, but Center researchers expect the extra impact to be significant.

While we cannot accurately estimate the number of lives that would be saved by widespread use of sprinklers, or the fraction of the population likely to buy sprinklers, the evidence from various research shows the potential for a significant increase in safety when sprinklers are used.

In nonresidential properties, average loss per fire in sprinklered buildings is much lower than in unsprinklered buildings, and there is evidence that the new home sprinkler technology will be able to achieve similarly dramatic benefits in American homes.

As an example of the overall impact of sprinkler systems on commercial properties in the century since sprinklers were first introduced, annual fire losses in Factory Mutual insured properties have dropped from 30¢ per \$100 of insured value in the 1860's to 2-3¢ cents per \$100 today.

Because home sprinklers are rare today, estimates of their potential impact on reducing residential property loss remain speculative but very promising. Research conducted at the NBS Center for Fire Research indicates that use of home sprinklers, combined with detectors, could reduce property losses in dwelling fires by 30-52 percent. These reductions would be achieved by current technology sprinklers, and it is expected that the estimates of the impact of the new technology home sprinklers will show even greater reductions.

ISSUES AFFECTING SPRINKLER USE AND EFFECTIVENESS

Sprinkler system costs are substantial -- much more than detector systems -- but in commercial and industrial properties, these costs often can be offset by sizable savings elsewhere.

Most companies and institutions have been able to offset the cost of their sprinkler systems as a result of sharply reduced insurance premiums. Reductions of 40 to 95 percent are not uncommon. Even at current inflation rates, insurance savings of this magnitude can pay for the cost of a sprinkler system in less than five years.

Turning to home sprinkler systems, the barrier of cost has been much higher and has so far blocked any widespread use of sprinklers in homes. But the recent breakthroughs in residential sprinkler technology allow sprinklers for new homes to be within reach of the average American household.

Over and above the cost of a residential sprinkler system itself, people's fear of water damage is a cost-related issue influencing public acceptance of home sprinklers. Much of this fear stems from misunderstanding the way sprinkler systems operate. For example, activation of the sprinkler system does not automatically set off all the sprinklers; each sprinkler operates separately in response to temperatures in its area.

Water damage when no fire occurs also is less a problem than many people believe. In fact, most sprinkler leakage incidents are caused by abuse of the system -- allowing pipes to freeze or overheat, or breaking pipes or sprinklers -- according to a five-year study of claims summarized in the NFPA Fire Protection Handbook. NFPA estimates

that an accidental sprinkler opening due to equipment defect occurs in less than one sprinkler per million per year. These statistics suggest that water damage incidents due to home sprinklers would not add significantly to the current rate of plumbing-related water damage episodes. In fact, sprinkler systems receive more thorough testing for leakage, water hammer, sensitivity to heat and cold, vibration and strength of frame than any other part of a building's water system.

Additional protection against water damage could result from current research now being conducted to produce a sprinkler that will shut itself off when the temperature drops below a certain point (indicating successful extinguishment) instead of requiring manual shut off as with current sprinkler systems. New sensing devices have greater flexibility and should be able to operate after sprinkler activation has occurred. Fire Administration research on more effective water distribution patterns also should help on this problem.

As with detectors, reducing sprinkler cost to a more manageable level for the average homeowner is not sufficient to attract those who do not perceive fire to be a real threat to them. There is a general lack of awareness or concern for the residential fire problem among the potential users of home sprinklers. Many people do not consider fire a threat to them. Public and private efforts, like those involving smoke detectors, must be encouraged to address this fatalistic attitude if residential sprinkler technology is to fulfill its potential of saving lives and property from fire.

An additional obstacle to the use of residential sprinklers is that water supplies and pressures required for effective operation are not practical in residences in some areas. For example, problems exist in rural localities where water is supplied from wells instead of distributed under pressure through pipes.

When considering factors related to public acceptance of residential sprinklers, aesthetic concerns were among reasons cited by those who said they would not accept sprinklers. Although there seems to be little complaint about the look of sprinklers in shopping malls and motel rooms, the prospect of sprinklers dotting the ceiling of one's home seems to be viewed in a different light.

Recessed sprinklers might solve this problem, but so far researchers have not found a way to maintain adequate sensitivity in sprinkler systems with concealed heads. Another approach would be to improve the appearance of the sprinklers themselves so that they would look more like decorations than fire suppression devices.

Over the long term, widespread use of sprinkler systems could reduce demands on public fire protection services. With a sprinkler system installed, flashover (instant total involvement of the room and contents) could be prevented and fire department response time would not be as critical as it is now. Early sprinkler control of fires, which could result in smaller fires to be attended by fire suppression forces, could allow reduced manpower needs on initial responses. This could result in long-term savings to a city. In addition, widespread use of sprinklers could help reduce fire fighter deaths and injuries, and in turn help reduce medical and related costs for fire departments. All of these benefits would be possible, however, only if sprinkler installations were sufficiently widespread.

Sprinkler systems constitute a sizable investment, even with the cost-cutting technological innovations recently achieved for home sprinkler systems. Recommendations can be made only after more data becomes available and the technology is further developed and assessed. When this developmental work is complete, a variety of incentives such as the following might be considered for use in both the residential and commercial areas:

- o Insurance credits for use of sprinklers be granted to residential property owners;
- o Property tax, income tax, or investment tax credits possibly including rebates analogous to those now being used to encourage energy conservation in homes;
- o Liability protection for sprinkler manufacturers possibly along the lines of traditional hold-harmless agreements;
- o More generous trade-offs of building code requirements for properties that have sprinklers;
- o Broader requirements for sprinklers in properties built or resold with Federal Loans or managed under Federally sponsored programs; and
- o Removal of obstacles to commercial and industrial sprinkler use, for example the overly conservative requirements in some communities for special backflow preventing devices.

SMOKE DETECTORS

Research indicates that *smoke* detectors provide greater potential for increased life safety than *heat* detectors, and discussion in this section will focus primarily on smoke detectors.

The smoke detector has been the fire protection success story of the 1970's in terms of public acceptance. In 1970, very few households (probably under 5 percent) owned detectors. In 1977, 20 percent of households had them. And, by 1980, about half the households in the country owned detectors!

While the increased awareness and use of smoke detectors in U.S. homes is relatively recent, detectors are not "new" to other types of occupancies. As a result of consensus standards like the NFPA Life Safety Code, smoke detectors are recommended for most public, residential and institutional occupancies like hotels, motels, hospitals, and nursing homes. Health care facilities are encouraged, and in some states required, to have detector systems that also sound alarms at the nearest fire stations since many occupants of health care facilities cannot respond to an alarm on their own.

Although we have made considerable progress in the expanding use of detectors beyond public and institutional occupancies and into about 50 percent of the nation's private homes, there is more work to do.

Now, the 50 percent of the population without detectors should be influenced to use them. That may be a more difficult goal to reach, because research indicates that a large share of households without detectors are low-income families who may be unable or unwilling to buy them, and renters who may be less likely to buy detectors for properties they do not own.

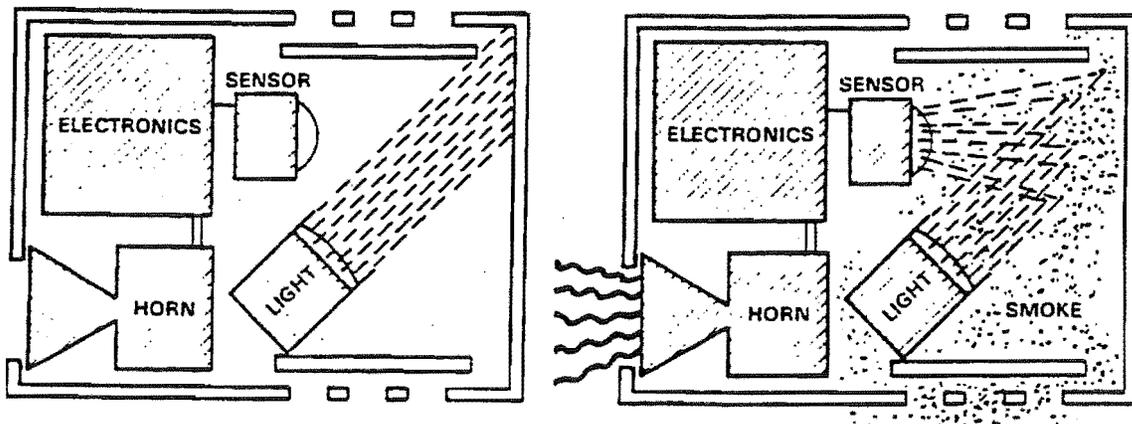
In addition, detectors now in use will have to be monitored to make sure they continue to perform effectively. There is some evidence that the sensitivity of detectors changes with time and use, and further study is needed to determine the impact of this apparent sensitivity change on the overall effectiveness of detectors.

A number of federal, state and local programs and legislative initiatives are addressing these problems in concert with efforts in the private sector. Those programs, as well as information about detector performance and effectiveness, are discussed later in this chapter.

HOW DETECTORS WORK

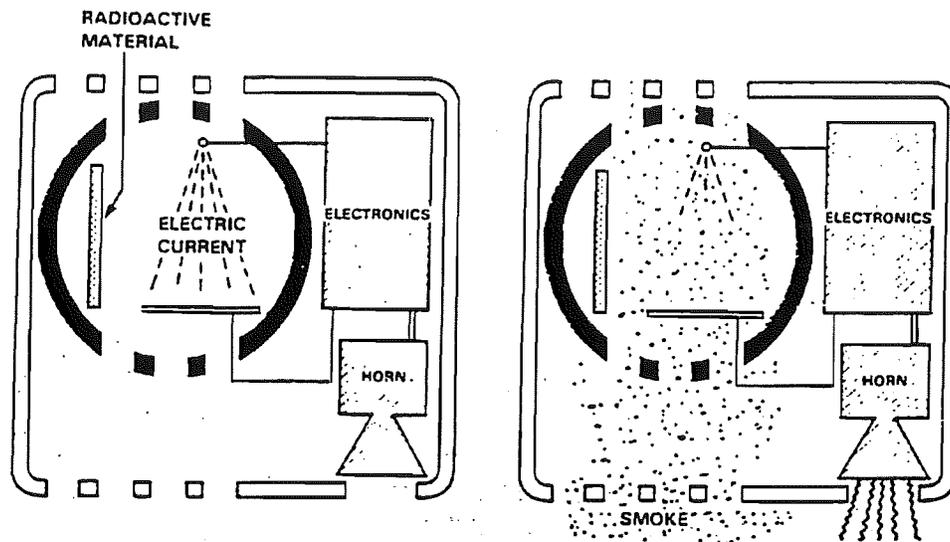
Detectors may be designed to detect heat or smoke. Most heat detectors are designed to react either to a particular fixed temperature or to a particular rate-of-rise in temperature, while most smoke detectors operate either on a photoelectric or on an ionization principle.

A photoelectric smoke detector uses a small light source, an incandescent bulb or a light-emitting diode (LED), which shines its light into an otherwise dark sensing chamber. The sensing chamber also contains an electrical light-sensitive component such as a photodiode or phototransistor. The light source and photocell are arranged so that light from the source does not normally strike the photocell. When smoke particles enter the sensing chamber of the photoelectric detector, the light is scattered by the surfaces of the smoke particles allowing it to strike the photocell and change the voltage at the light-sensitive component. (This reflection of light is the same means by which we see smoke in the air. That is, light from the room is scattered by smoke particles and reflected into our eyes.) When the voltage reaches a predetermined level, the detector sounds an alarm. Smoldering fires produce more of the kind of smoke particles that trigger this process than flaming fires produce. As a result, photoelectric detectors respond slightly faster to smoldering fires than to flaming fires.



The photoelectric smoke detector.

An ionization smoke detector uses a small amount of radio active material to make the air within a sensing chamber conduct electricity. When very small smoke particles enter the sensing chamber, they interfere with the conduction of electricity, reducing the current and triggering the alarm. The particles to which this class of detectors responds are too small to be seen with the human eye. Because more of these invisible particles are produced by flaming fires than by smoldering fires, ionization detectors respond slightly faster to flaming fires than to smoldering ones.



The ionization smoke detector.

Heat detectors may be designed to detect either a high fixed temperature or a specific rate-of-rise in temperature. Studies have shown that heat detectors respond less quickly to most fires than smoke detectors. So heat detectors should not be used for primary protection in bedrooms, stairways, halls and living rooms. Heat detectors are useful for additional protection in areas where smoke detectors are susceptible to numerous nuisance alarms from cooking smoke, forced air, gasoline fumes or other causes. Kitchens, attics, garages and furnace rooms are among the areas where heat detectors are appropriate.

In addition to having a variety of sensor technologies, smoke detectors can be designed to be powered by batteries, plugged into wall sockets, or wired directly into a building's electrical system. Detectors may be isolated, single-station models which

have their sensor and alarming devices in the same self-contained unit, or they may be interconnected. In an interconnected system, the unit that discovers the fire not only sounds its alarm, but also activates the other detectors in the system by transmitting signals via line carrier (e.g., household power circuits or telephone lines) or radio.

Most of the growth in home detector use in the 1970's centered around battery-powered, single-station, ionization-type smoke detectors.

In commercial occupancies, however, detectors are most often a part of a system which supplies power to the detectors and performs any number of functions such as monitoring the integrity of the wiring, sounding the alarm devices in all or selected parts of the building, and in some cases, transmitting the alarm to a fire department or some other continuously manned location.

DETECTOR STANDARDS

To ensure that the smoke detector technology which is most effective for life safety is available to the public, the Fire Administration and the NBS Center for Fire Research have contributed to the development of detector performance and installation

In 1973 a joint project was initiated by the NBS Center for Fire Research and Underwriters Laboratories, Inc. (UL), one of the major organizations that certify fire-related products for acceptability, to develop an approval standard for residential (single-station) smoke detectors. The results of that project then formed the basis for UL-217, "Standard for Single- and Multiple-Station Smoke Detectors" also recognized by the American National Standards Institute (ANSI), and have had substantial impact on the requirements in Canada, Australia, and to a lesser extent in the United Kingdom and various European countries.

The NBS Center for Fire Research also sponsored research with Underwriters Laboratories to assess how the sensitivity of residential smoke and heat detectors is influenced by where those detectors are placed within the residence. Conducted by the Illinois Institute of Technology (IIT) Research Institute, the study showed that putting a smoke detector on each floor of a home was significantly more effective in terms of the detector's sensing capabilities than putting them only outside bedrooms and at the head of basement stairs as was the norm. These results were so convincing that the NFPA-74, "Standard for Household Fire Warning Equipment", was changed in 1978 to require this "every level" system.

To provide additional information with which to refine detector performance standards, the Fire Administration managed another study by the IIT Research Institute which was funded by the National Science Foundation. In the study, IIT Research Institute reviewed existing methodologies used in testing detector performance. It found that when wall-mount detectors were tested suspended from the ceiling in the center of a room, the test results varied widely from results when the detectors were mounted on sidewalls.

These findings led to modifications in UL-217 testing procedures to allow wall-mount detectors to be attached to actual sidewalls for testing. UL-217 testing procedures also were modified to include a smoldering fire test, as a result of the IIT Research Institute study. In the course of the study, IIT Research Institute also developed spacing criteria for use in testing nonresidential detectors.

OVERALL EFFECTIVENESS OF DETECTORS

An increasing volume of evidence indicates that detectors do indeed save lives and property. Current Fire Administration estimates, based on data from the National Fire Incident Reporting System (NFIRS), show that the rate of deaths per fire in dwellings without detectors is 50 percent higher than that in dwellings with detectors. Preliminary results of a special analysis by the NBS Center for Fire Research of 1978 NFIRS data, show the same result. Although part of the difference in the death rates of detector owners and nonowners is due to socioeconomic differences between the two groups, part is undoubtedly due to the effectiveness of detectors in providing early warning and additional escape time to detector owners.

Knowledgeable observers in the fire service also see evidence that detectors save lives. The Maryland State Fire Marshal, for example, believes that detector requirements passed by the state (Maryland was one of the first states to pass detector legislation) and some of its largest jurisdictions have played a considerable role in a three-year trend toward fewer fire deaths. The trend began after a 1975 state law required detectors in new residential properties and in some existing residential properties. The trend continued through 1979. By that time, detectors also were required in most or all existing residences by three of the state's largest jurisdictions Annapolis, Montgomery County and Prince George's County.

Emphasizing further the importance of early detection in saving lives, a National Fire Protection Association study of 873 fire deaths found that most of the deaths occurred

in fires which were not discovered for a long time after they started. The study showed that 63 percent of the fatalities occurred in fires detected at least 20 minutes after ignition, and 38 percent occurred in fires detected at least 40 minutes after ignition.

Smoke detectors also seem to be especially important for life safety in mobile homes. A three-year study by the U.S. Fire Administration of the Federal Mobile Home Construction and Safety Standard concluded that "the provision of FMHCSS causing most of the reductions in rates of fire deaths, injuries and property loss appears to be the detector provision." The in-depth study found death rates in fires in mobile homes without detectors were 2-4 times higher than death rates in mobile homes with detectors. As a result, the study recommended that the FMHCSS provision which requires that mobile homes be equipped with a detector be continued and that mobile home owners be encouraged to have two detectors for added protection.

The rate of injuries, as well as deaths, from fire can be reduced somewhat through the use of detectors. Current data indicates the reduction is small. Specifically, NFIRS data for 1978 shows that the chances of injury in a dwelling fire are slightly lower for homes with detectors (4.5 injuries per 100 fires) than for homes without detectors (4.8 injuries per 100 fires). In addition, preliminary results of the NBS Center for Fire Research special analysis of 1978 NFIRS data show a potential reduction of 7-9 percent in fire injury rates in dwellings with detectors.

The Fire Administration's in-depth study of mobile home fires found a large difference in injury rates associated with detectors, providing further evidence that smoke detectors are especially important in mobile homes. One factor which may reduce the beneficial impact of detectors on injury rates is that persons alerted to fires by detectors are more likely to be injured trying to put out the fire or rescue someone from it. Statistics suggest that detectors give enough early warning to permit more people to escape unharmed, but that some people use that extra time to try to extinguish the fires themselves and thereby incur avoidable injuries.

Current evidence is not sufficient to determine the impact of the use of smoke detectors on property loss from residential fires. Preliminary results of the NBS Center for Fire Research special analysis of detector effectiveness indicate a potential 17-20 percent reduction in property loss in dwelling fires. In addition, the Fire Administration's in-depth study of mobile home fires found a sizable reduction (\$675) in average property loss per fire when detectors were present. Detectors may be having a stronger impact than we can readily measure now. They may give warning of a fire while it is small enough to be put out by the occupants, and never be reported to the fire department.

ISSUES AFFECTING DETECTOR USE AND EFFECTIVENESS

Current data indicates cost probably is not a significant barrier to the use of detectors in all but the poorest households. This is not surprising since prices for single-station heat or smoke detectors range from \$10 to \$50, and even for large houses or apartments, two or three detectors usually suffice. Slightly higher costs per unit apply to interconnected detector systems which are used in institutions, hotels and other large properties.

A number of public and private sector programs to get detectors into more homes already have been undertaken. For example, the Fire Administration has promoted the adoption of legislation at the state and local levels to require smoke detectors in residences. A booklet, Smoke Detectors and Legislation, was published by the Fire Administration in 1977 to give communities information about the status of legislative efforts around the country and sample legislation for use by communities considering similar measures. The booklet was updated and published again as Smoke Detector and Legislation Update in 1979.

Several local jurisdictions have developed programs not involving legislation to place detectors in the homes of their citizens. These programs have taken various forms, with widely varying costs. The collaboration of the fire department and the local broadcast media to sponsor a public fire education program in which detectors were given away as prizes in contests. Helping major employers and large civic groups to arrange bulk discount purchases of detectors for their employees and members. Some cities, like Wilmington (DE) and Kansas City (MO), have purchased detectors and gave them free of charge to occupants in the most fire prone neighborhoods.

Programs like these could provide the basis for expanding the protection offered through the use of smoke detectors to segments of the population as yet unprotected, possibly with partial or full subsidies by federal, state, or local governments or private groups. These and similar initiatives should be encouraged as a means toward further reducing the nation's fire losses.

Although perceptions about the need for detectors are changing, as evident from the rapid growth in their use, many people still do not perceive that they need protection. This suggests that more work needs to be done to emphasize the benefits of having detectors and the risks of not having them. The Fire Administration, in cooperation with the private sector in some cases, has undertaken a number of programs aimed at increasing the public's awareness of the benefits of detectors and encouraging their use.

To help communities develop their own smoke detector campaigns, the Fire Administration, in cooperation with the National Bureau of Standards, prepared a series of public education manuals based largely on successful local programs.

The volumes in the series are:

- Volume I The Smoke Detector Resource Catalog. A fact sheet on smoke detectors, guides for finding smoke detector materials, case histories of successful programs, a legislative overview, and evaluation techniques.
- Volume II Moving the Public on Smoke Detectors. A two-part manual on generating support through community organizations and the media.
- Volume III Smoke Detector Technology. A detailed description of smoke detector operation, selection, installation, and maintenance.
- Volume IV Smoke Detectors and Legislation. An indepth review of the current status of state and local smoke detector legislation (updated in 1978).
- Volume V Smoke Detector Training. A suggested curriculum for training members of the fire prevention community to present smoke detector education to the public.

The five manuals have been used in a series of smoke detector seminars, developed and delivered to communities by the Fire Administration's Office of Planning and Education and the National Fire Academy. The seminars have been effective in expanding information on smoke detectors in communities around the country. The success of these seminars as a vehicle for promoting the use of detectors could serve as a model for further efforts to reach those who do not currently see the need for detector protection.

The life-safety effectiveness of detectors depends, in large part, on how people react when the detector alarm sounds and on their ability to act. Some people, those who are very young, very old, bedridden, or incapacitated by drugs or alcohol, may be unable to respond to a detector alarm. In other cases, people may respond in ways which expose them to unnecessary risk. As noted earlier, 1978 NFIRS data on fire injuries suggests that the early detection provided by detectors may encourage more people to attempt to fight the fire themselves, and this may result in unnecessary injuries.

Even when people do not attempt to fight the fire themselves, they still may expose themselves to avoidable risk by not having an escape plan. Research shows that escape plans rarely have been worked out, let alone rehearsed in most households. The usual escape path through the house sometimes becomes unusable due to smoke or carbon monoxide before other escape paths such as out the windows of bedrooms. This can happen, for example, in fires that begin in the living room and spread to the hall, thereby blocking the path to the front door well before the bedrooms become untenable.

Programs specifically aimed at improving people's reactions in fires have been conducted over the years. Most notable are NFPA's "Operation EDITH" (Exit Drills in the Home) and the popular "Learn Not to Burn" TV public service announcements, also by NFPA, featuring actor Dick Van Dyke. Since research indicates that people's reactions are so important to life safety in fires, efforts like these should be continued and expanded.

Lack of power, usually because of missing or dead batteries is, however, an important factor in cases of unsuccessful detector performance. The choice between wired in, AC powered detectors and battery powered ones is essentially a choice between ease of maintenance and ease of installation. Wired in detectors generally require less maintenance than battery powered detectors, and for new homes, where ease of installation is not as critical because professional builders are involved, most codes requiring detectors specify wired in ones. The rapid growth in detector ownership, however, has been in ownership of battery powered detectors which homeowners easily can install on their own.

The Fire Administration's analysis of the IAFC Foundation study results indicates that the failure rate for battery powered units studied was double that of the AC powered units studied. This confirms the view that more problems arise due to lapses in battery replacement than as a result of problems in AC power source.

A 1977 survey conducted by the Aerospace Corporation for the Fire Administration found that fewer than 10 percent of all detector owners do any maintenance other than replacing batteries. There is some evidence to indicate that without periodic cleaning, a detector can lose some of its sensitivity. Monthly or even weekly testing is recommended by groups like the National Fire Protection Association.

Existing studies have found widely differing results with regard to the frequency of nuisance alarms, i.e., the frequency of alarms when no unwanted fire exists. Methods

for reducing the rate of nuisance alarms may involve adjusting the location of detectors, and the type (and possibly the brand) of detector used. In general, photoelectric detectors produce far fewer nuisance alarms than ionization detectors, while maintaining sensitivity to real fires, especially smoldering fires which account for a high percentage of fire fatalities.

The radiation source in ionization detectors is not a hazard. Tests by the independent Consumers Union and other organizations have shown that the radiation from ionization detectors adds at most a small fraction to the exposure people receive from the natural environment (so-called background levels of radiation). The study also expressed confidence that disposal of used detectors in landfills or through incineration would not endanger people or the environment. Should anyone be concerned in spite of these studies, the photoelectric detector is a highly satisfactory alternative, with no radiation source at all.

Overall, smoke detectors are a proven effective addition to the repertoire of fire protection approaches. When adequate data is available to support further incentives, options to consider might include property tax, income tax, or investment tax credits for home owners, builders, and landlords.

THE MYTH OF PANIC

The following article was written by John P. Keating, Ph.D. and appeared in the May 1982 issue of Fire Journal, published by NFPA.

During a literature review on behavior in fires that Elizabeth Loftus and I completed in 1974, one fact became depressingly clear. The most striking feature gleaned from the review of psychological material related to people's behavior in fire was the dearth of relevant data; this fact was amazing. When codes have been written, fire suppression technology installed, and communication networks established, then the issue of fire safety becomes a problem of people -- how to inform them, how to educate them, how and how many of them to evacuate, how to forestall life-threatening responses -- in other words, how to teach people survival.

Periodically, we are tragically reminded that the people-piece of the fire puzzle remains out of place. Stating that people "panic" during fires provides an easy excuse. The implications are simple -- people flunked the survival test of the fire. A further implication regarding panic is even worse. It can instill a type of pessimistic attitude that the situation cannot be changed since such a panic response must be primordial, and that attempts to modify such a basic part of human behavior during emergencies are futile.

Multiple deaths in fire tragedies are frequently headlined in the press by reports of panic behavior of the victims. Such conclusions by the press persist in spite of the insurmountable research evidence that concludes exactly the opposite. People like John Bryan, Enrico Quarentelli, Joseph Swartz, and others who share almost a century of experience researching major tragedies have been unanimous in concluding that there is minimal evidence of panic during most fires. The research conducted by the NFPA in its investigation of the 1977 Beverly Hills Supper Club tragedy concluded that there seemed to be no panic related to the 164 deaths. Quarentelli concluded that even during the Coconut Grove fire of 1943, which has been described as the epitome of people panicking in a tragic situation, as few as one-third of the people may have actually panicked. Our current program of research, interviewing about 100 victims and survivors of 90 single-dwelling, residential fires has yielded no evidence as yet of any panic behavior by the people involved. In fact, what we most frequently have found is just the opposite: altruistic, helping behavior especially among family members.

Most of the aforementioned researchers argue that "panic" is a grossly abused and certainly overused term to summarize people's behavior in stressful situations. But why is there such discrepancy between popular media reports and carefully researched conclusions? First, "panic" is an easily understood shorthand term that also creates good headlines to attract readers. Second, objective observers generally tend to minimize situational factors affecting behavior and emphasize personal responsibility for the behavior of others. Finally, and perhaps most important, there is the problem of defining the word "panic."

What is panic? Many definitions are offered, but I believe there are four elements of panic that are easily identified by analogy with the wild scramble that accompanies financial failures. First, there is the hope of receiving scarce or dwindling resources, compared to the demand for such resources. In financial practice, the run on banks is a rush for money that seems to be disappearing. Second, there is a contagion that affects large groups, especially if this contagion is generated by people of some social prestige. For instance, when leading commentators on Wall Street indicate that it is time to sell, the stock market reflects this advice by panic selling, frequently much below the stock's value.

Third, there seems to be an obsession with personal, as opposed to societal, responsibilities. ("I'll get mine, no matter what happens to my neighbor.") And fourth, frequently such panic selling on the market is somewhat irrational. To take thirty cents on the dollar is not a good practice and, in fact, if one could wait for a while, the thirty cents in time might approach the actual dollar amount that had been invested.

These same four elements are essential before any behavior in a fire situation should be called "panic behavior." First, the typical panic response manifests a hope to escape -- escape through dwindling resources. Second, there must be some kind of contagious behavior, especially if keyed by leaders in the "community" that is affected by the fire. Third, each person has to be aggressively concerned about his own safety, as opposed to concern for other people who are also in the fire. Finally, and most important, there must be irrational, illogical types of responses.

The main thesis of this theory is that one or more of these elements are not usually present in fire evacuation. The practical corollary to this thesis is the optimistic view that we can prevent an appearance of panic during such situations through fire safe construction and surveillance techniques that would help people during the pressure of evacuation.

The first element of panic is a hope to obtain a dwindling resource. The dwindling resource in a fire situation is the escape route. The potential for panic is present when escape routes seem to be closing, few in number, and definitely insufficient to accommodate the masses who need to evacuate. There was no mass panic during the great San Francisco earthquake and subsequent fire because people had time to move themselves out of their buildings and onto the surrounding hills... no panic, in other words, because the evacuation route was not shrinking.

Where the fire fighting community is concerned, we must guarantee that hope in the dwindling resource is a true hope. For instance, in the "panic" reported by the media that took place during the Iroquois Theatre fire in Chicago in the early part of this century, people piled up at the locked exit doors, or were not able to go down the fire escapes. There was obviously hope in the dwindling resource of an evacuation route that simply did not exist. This is not panic behavior, but a very reasonable response, a hopeful response -- to flee from an obviously threatening situation. In some recent high-rise hotel fires, smoke accumulated in the stair towers. For instance, in the MGM Grand Hotel fire in Las Vegas, the number of deaths that occurred between the twentieth and twenty-second floors of one interior stair tower is indicative of this problem. People in that fire had great hope; they had read the signs (or we presume they had read the signs) in the elevator lobbies stating "Don't use the elevators, move to the stairwells," and many of them did so. When they went down the stairs, they were overcome by toxic fumes that caused their deaths. They had an implicit hope and belief in society's control of the building's construction that those exits would be safe, and that if the stairways were used, the guests could save themselves. Such behavior is not panic. However, this type of incident reemphasizes the importance of surveillance and building codes... to make certain that when we have designated evacuation routes for people, such routes will exist and be safe. The hope of people during the stress of a fire will be dashed as such escape routes constrict.

The second element that exists in a panic situation is contagion, which causes people to lead one another to behaviors that the media often summarize with the word "panic." Such contagious action is not surprising and is supported by a common psychological finding that theoreticians call "social comparison." It is very simple. In ambiguous situations, people doubt their own judgment abilities and search for the best source of information available. This source frequently is found in other people. "How are they reading the same ambiguities that I am reading?" "What kind of responses will they make?" Frequently, we follow their lead in what is called "modeling behavior." We follow the leader. We do what others decide because we are not certain how we should act.

A type of behavioral contagion can result. This will happen especially if someone keynotes a negative type of response. We will tend to follow such modeled behavior unless we have discounting information that indicates such behavior is not proper.

This particular element of panic gives me great hope in our ability to forestall the types of tragedies that we have recently witnessed in high-rise structures. For instance, after the MGM Grand Hotel, Stouffer's Inn, and Hilton Hotel fires, I was doing some traveling. In almost every city that I visited, every newspaper that I picked up during that week printed fire safety rules for hotel guests: what to do in a fire, to keep your key when leaving a room, etc. I personally had not seen those rules before that time. If a hotel's guests are told how they should behave in a fire situation, those individuals of leadership capacity could be able to lead an entire group to safety. A type of positive contagion would prevail.

My five-year-old child came home from school and clearly demonstrated to me how he had been taught to get out of a fire: "crawl low in smoke." The fire protection community is beginning to aim at children in communicating information on proper behavior during fires. After the Hilton Hotel fire in Las Vegas, a woman wrote to the NFPA in gratitude, saying that she had been in a Hilton hallway and couldn't see the floor because of the thickness of the smoke, but remembered Dick Van Dyke's TV spot that said to crawl. She crawled, but most important, she was also able to take her companion with her, a companion who was close to panic because she did not know what to do in the fire. The woman could claim two tragic deaths less in that fire because of the simple TV message that Dick Van Dyke had communicated to her so graphically.

The third element of real panic implies a clutching for personal, as opposed to anyone else's, safety... that we help only ourselves, and no one else. Reports from many fires question that such overriding self-interest actually happens. For example, a key point in the Beverly Hills postfire investigation was that the waiters and waitresses of that Supper Club were responsible during the fire for leading the patrons through the relatively confusing exit patterns. But most important, the waiters and waitresses did not lead the entire community of diners to evacuation, but went immediately to the tables that were their assignments, and led only the people dining at those tables to safety. The key here is that the idea of each being for his own does not pertain when social links have been established among those exposed to a fire. For instance, we do not find much panic behavior in residential fires at single family dwellings. It is the rare father who would say, "I'm getting out of this fire and never mind my kids, my wife, or whomever." In fact, our own investigations, as brief as they have been, have

revealed many acts of heroism and altruism, especially by leaders of families who have stayed and risked serious injuries to themselves to evacuate their children. This is not panic behavior, but the exact opposite; not "What I can get for myself, but what I can do for those in danger."

I think the fire fighting community has to capitalize on this fact of socially linked altruism. For instance, when training people in different situations, whether they are personnel in nursing homes, restaurants, hotels, etc., we should capitalize on the fact that these people will have a constituency that will be defined as their own -- the beds that they serve, the tables they wait on, etc. Our training processes must take advantage of any relationship that has been established and we must realize that such links will frequently overcome the selfish urge for self-escape.

Finally, and perhaps most important, panic has been characterized as irrational or illogical types of responses, actions that you and I know we would never take if we were in such a situation. This is my biggest problem in categorizing the behavior of victims of tragic fire as panic-induced. First of all, we have to understand the simple psychology of what happens to each of us in a stressful or anxiety-producing situation, a fearful situation. Because of heightened anxiety, our attention is very focused. We no longer are aware of all the peripheral cues that may be present in an environment, but become intensely focused, processing only those major elements of the environment that are instantly and immediately judged as relevant to our safety.

Consequently, it is essential to keep messages simple in a fire situation, so simple that even with this very focused attention span, the messages become the predominant cue in the environment that directs people to safety. Fear focuses one's attention and makes it difficult to process a lot of information under such constraints of anxiety. In hotels, positive and negative aspects of emergency communication are readily visible. I have noticed that signs prohibiting elevator use during fires are now usually displayed with international symbols. This is an improvement over the previous red signs embossed with little white letters, containing relatively long messages that need to be deciphered, not read. The minus I have noted is that the sign says "Use the stairs," with no indication of where they are located. We must make the information relative to a fire transparently obvious and immediately understandable, instead of requiring two different information-processing steps to determine the proper evacuation route.

It is important to remember here that when people are anxious they tend to use their most familiar responses. This causes many potential problems in evacuating both high-rise and multiple-unit dwellings. We get to our high-rise apartment or high-rise office on the seventeenth floor by using elevators. Since we do that day in and day out, it becomes a dominate response. Consequently, under pressure to get out, our first tendency will be to go out the same way that we do every other day: use the elevators and move out of the building. Drills are obviously one way to help overcome such a tendency. But you cannot make the residents in a transient situation like a hotel go through daily, weekly, or semi-annual fire drills. Consequently, this is an area in which we must learn how to educate people -- how to tell them where safe exits are, how to stop that first response tendency that is heightened during anxiety, and how to move them to the relatively safer routes -- the stairwells.

A related stimulus of rational behavior during fires is the provision of information that will enable people to make rational responses. No one likes to make important decisions without knowing all of the relevant information and details involved. This is where the role of education becomes preeminently important in forestalling major tragedies. We have to give people information in simple, easily translatable terms. We have made great strides in this area in the last five or six years. The United States Fire Administration and the NFPA have been reaching out through both media and school programs to educate the population about fire and fire evacuation procedures in sophisticated ways, but simple terms. This is critical.

If we have proper information, like the lady in the Hilton fire, we will attempt to use it. This highlights the important role of vocal communication systems during fires in public buildings. When we do not have proper information, we will use any that we can obtain to make our evacuation as safe as possible. Unfortunately, the information that we pick up can be faulty because of dominate cues, past behavior, or because it is based on other people acting in maladaptive ways and can eventually lead to what could be called panicked behavior. But such panic behaviors are not irrational; frequently, they are rational decisions based on the best information available to the people at the time.

Consequently, the burden is again placed on the fire service community to make available the information that people need during fires before the actual fire occurs. And while the MGM Grand and other hotel fires are tragedies, at the same time they paradoxically provide golden opportunities to focus on the question of fire safety and

to blitz people with the information that they may need. Fire safety information provided on hotel fires (which are of current interest) is the same type of information that will prove beneficial to people in their own residences, work places, and other public settings.

Finally, the role of social engineering in all buildings is critically important. We have to make buildings that meet people's needs and are tailored to their behavioral tendencies, as opposed to buildings that satisfy designers' or architects' aesthetic interests. This is an essential role for the fire service community to emphasize. The buildings have to be made to fit the behaviors that people are familiar with, behaviors that they will engage in during emergencies. A lesson related to this point can be learned from human factors engineering. In the early days of World War II, when human factors engineering was an underdeveloped field, companies manufactured machinery that had tremendous capability but was impossible for a single person, or many people, to manipulate because of the location of the displays, dials, and devices. Because of defense needs during World War II, the whole study of human factors engineering expanded tremendously. As a result, machines no longer were simply being made; industrial designers started looking at the abilities of people and then tailored the machines to accommodate human capacities and limitations. A similar evaluation is necessary in building design. We cannot talk about retro-fitting the universe for fire safety, but we can certainly think about making new buildings capable of capitalizing on the safety instincts that people bring to these buildings. After the building has been completed, it is much too late to begin talking about tailoring the building to people's needs. Such a task must begin at the design stages.

We have to begin to educate architects who are, as I found while surveying several different schools of architecture, underexposed to critical concerns related to the whole fire issue. We have to begin to expose designers to the human needs of people so that they can design buildings that are responsive to these needs and tendencies. And to do this, we must further investigate the way that people actually behave in various fire situations.

Recently, the emphasis on the psychological aspect of people's behavior in fires has begun to occupy a greater area of practical and important research. If we know how people tend to behave in fires, we can take some classical findings on well-established psychological theory and see how they translate to the fire situation, which could guide us in creating building codes with an eye to human responses. If we begin to find the human behaviors that are dominant, easy, and easily remembered, we then can begin

to translate this information to real application in fire drills and evaluation plans. We can begin to talk effectively to architects, to designers, and to people responsible for public buildings to make sure that they are not misinformed about how people will behave during actual evacuation.

My hope as a social scientist is that we are beginning to do this, just as ten or fifteen years ago many of the technologies that are now common were beginning to be developed. This is a great hope, but I think we are moving to a new era in fire suppression and fire fighting technology in which technology can no longer afford to ignore the human dimension.

APPENDIX A

Fire and Burn Education Survey

FIRE AND BURN EDUCATION SURVEY

Please circle the BEST answer

1. When cooking at a stove, it is most important that you wear clothes that:
 - a. Fit loosely around arms and body
 - b. Are made from nylon fabric
 - c. Fit tightly around arms and body
 - d. Are made from cotton fabric

2. The most common kitchen fires involve:
 - a. Grease build-up in broiler
 - b. A pan on top of the stove
 - c. Microwave ovens
 - d. Electrical appliances

3. The most effective way to extinguish a grease fire in a pan is to:
 - a. Place a lid directly down on the pan
 - b. Shake baking soda on the fire
 - c. Carry the pan to the sink faucet
 - d. Slide a cover over the top of the pan

4. The most effective way to extinguish an oven fire is to:
 - a. Remove the pan from the oven
 - b. Use a fire extinguisher
 - c. Close the oven door
 - d. Shake baking soda in the oven

5. The best way to prevent a kitchen fire is to:
 - a. Remain in the kitchen while cooking
 - b. Plug only two appliances in at one time
 - c. Keep small children out of the kitchen
 - d. Not leave the kitchen for more than 5 minutes

FIRE AND BURN EDUCATION SURVEY

6. Most home fire extinguishers may only last:
 - a. 6-12 seconds
 - b. 30-60 seconds
 - c. 60-90 seconds
 - d. 90-120 seconds

7. To use a fire extinguisher properly, you should get within an effective range of:
 - a. 5 feet
 - b. 10 feet
 - c. 15 feet
 - d. 20 feet

8. Most residential fires start in the:
 - a. Bedroom
 - b. Kitchen
 - c. Garage
 - d. Living room

9. If you are only installing one smoke detector, it should be placed near:
 - a. Kitchen area
 - b. Garage
 - c. Bedroom area
 - d. Living room

10. Which of the following fabrics is most DIFFICULT to ignite and burn?
 - a. Wool
 - b. Cotton
 - c. Synthetics
 - d. Silk

FIRE AND BURN EDUCATION SURVEY

11. Most fire deaths are caused by:
 - a. Cooking fires
 - b. Electrical fires
 - c. Heating fires
 - d. Smoking fires

12. If you attempted to jump from a burning building, how many feet could you drop and still have a 50-50 chance of surviving without serious injury?
 - a. Less than 10 feet
 - b. Less than 20 feet
 - c. Less than 30 feet
 - d. Less than 40 feet

13. Carbon monoxide causes:
 - a. Coughing
 - b. Watering of eyes
 - c. Disorientation
 - d. Fumes

14. If you woke up at night, smelled smoke, and found your closed door hot to the touch, you should:
 - a. Call the fire department
 - b. Use your alternative exit
 - c. Break the window
 - d. Open the door to see if there is smoke

15. If you were trapped in a bedroom on the 5th floor with flames and smoke in the hall, you should:
 - a. Take your room key
 - b. Prop your door open
 - c. Take the elevator up
 - d. Take the elevator down

FIRE AND BURN EDUCATION SURVEY

16. If you need to leave your hotel room in the event of a fire, you should:
 - a. Take your room key
 - b. Prop your door open
 - c. Take the elevator up
 - d. Take the elevator down

17. Spontaneous combustion is caused by:
 - a. An external heat source
 - b. Things that generate their own heat
 - c. Storing rags in a closed metal container
 - d. Storing flammable liquids improperly

18. The best way to extinguish an electrical fire is to:
 - a. Throw baking powder on the fire
 - b. Throw water on the fire
 - c. Use an AB type fire extinguisher
 - d. Use an ABC type fire extinguisher

19. A jelly filled pastry, heated in a microwave oven can be cool to the touch, yet have an internal temperature that is:
 - a. Same as outside
 - b. Equal to boiling
 - c. Cooler than outside

20. The most important thing to locate when you enter a theater, restaurant or hotel is:
 - a. Telephones
 - b. Fire extinguishers
 - c. The exits
 - d. The sprinklers/smoke detection system

FIRE AND BURN EDUCATION SURVEY

21. The most important part of a home fire safety plan is:
- a. The fire department phone number next to your phone
 - b. A second exit out of every room
 - c. An accessible fire extinguisher
 - d. A smoke detector located near bedroom area
22. The safest way to exit a smoke filled room is to:
- a. Run quickly
 - b. Walk slowly
 - c. Crawl on stomach
 - d. Crawl on hands and knees
23. People are in the most danger from smoke when they are:
- a. Cooking
 - b. Asleep
 - c. At work
 - d. In the garage
24. If you think there is a fire on the other side of a door, the first thing you should do is:
- a. Open the door slowly
 - b. Feel the door
 - c. Open the door quickly
25. _____ represent 35% of our nation's burn deaths and injuries.
- a. Children
 - b. Elderly
 - c. Handicapped
 - d. Middle aged

FIRE AND BURN EDUCATION SURVEY

26. Which is the most serious burn classification?
- a. First degree
 - b. Second degree
 - c. Third degree
27. The best first aid treatment for a burn is:
- a. Ice
 - b. Ointment
 - c. Bandage
 - d. Cool water
28. If your clothes catch on fire you should:
- a. Take off burning clothes
 - b. Run to put out the flames
 - c. Drop and roll the flames out
 - d. Wrap up in a blanket but remain vertical
29. If a person with burns appears to be in a state of shock you should:
- a. Walk the person to keep them awake
 - b. Perform cardiopulmonary resuscitation (CPR)
 - c. Lay them down and maintain body heat
 - d. Put cool cloths on their forehead
30. Which type of heater does not need a way to allow fumes to escape?
- a. Coal
 - b. Wood
 - c. Electric
 - d. Gas

FIRE AND BURN EDUCATION SURVEY

31. Which one of the following is NOT needed for a fire to occur?
- a. Nitrogen
 - b. Fuel
 - c. Oxygen
 - d. Heat
32. Smoke contains one of the following poisonous gases:
- a. Methane
 - b. Carbon Monoxide
 - c. Ammonia
 - d. Peroxide
33. If you have more appliances than you have electrical outlets, you should use:
- a. A triple outlet adapter
 - b. Extension cords
 - c. Only grounded plugs
 - d. Only two at a time
34. Gasoline should be stored in:
- a. Glass container
 - b. Plastic container
 - c. Safety can
 - d. Any metal can
35. Gasoline is dangerous because the:
- a. Liquid might explode
 - b. Vapors might ignite
 - c. Fumes are toxic
 - d. Liquid easily mixes with other liquids

FIRE AND BURN EDUCATION SURVEY

36. It is safest to add fuel to a lawn mower, motor bike, portable heater or other machinery when the engine is:
- a. Indoors
 - b. Broken
 - c. Running
 - d. Cold
37. Which of the following is considered most flammable?
- a. Kerosene
 - b. Gasoline
 - c. Lighter fluid
 - d. Paint thinner
38. If your hot water heater is set at 160°, you can sustain a serious burn in:
- a. 1 second
 - b. 5 seconds
 - c. 10 seconds
 - d. 15 seconds
39. Toxic means:
- a. Flammable
 - b. Combustible
 - c. Poisonous
 - d. Corrosive
40. Nearly all flammable liquid vapors are:
- a. Lighter than air
 - b. Noncombustible
 - c. Heavier than air
 - d. Same density as air

FIRE AND BURN EDUCATION SURVEY

41. What is caused by electricity traveling through the air?
- a. A short circuit
 - b. A conductor
 - c. An arc
 - d. A misfire

APPENDIX B

Assignment Sheets

**PUBLIC EDUCATION 1
COMMUNICATION**

ASSIGNMENT SHEET #1

TOPIC: Presentation Outline

**MATERIALS
NEEDED:** Student Presentation Topic/Audience
Sample Presentation Outline

INTRODUCTION: An effective presentation is one that is well organized and thoughtfully prepared. One of the steps toward this end is to prepare an outline of your presentation. This outline should be sufficient to deliver your presentation from and should enable you as an educator to deliver any presentation in a professional and competent manner.

ASSIGNMENT:

1. Review both the Sample Outline included in your student manual and your notes on this subject from lecture.
2. Using your assigned Topic/Audience, prepare an outline of your presentation that may be used when it is given. Be sure to include:
 - * Introductory comments, motivational stories, etc.
 - * The main points you wish to cover.
 - * Concluding statements, question/answer period, etc.
3. Submit completed outline to the instructor at the conclusion of your presentation.

**PUBLIC EDUCATION 1
COMMUNICATION**

ASSIGNMENT SHEET #2

TOPIC: Press Release

**MATERIALS
NEEDED:** Student Presentation Topic/Audience
Sample News Release Form

INTRODUCTION: Working with the news media is one of the most effective ways to reach large numbers of people. As a public educator, writing news releases about upcoming events, department happenings, or cause of fires is likely to be an important part of your job. This assignment will give you the opportunity to write a press release using a standard format. Although specifics required by each news agency may differ, nearly all follow a format similar to the sample attached.

ASSIGNMENT:

1. Review the provided news release format and sample release.
2. Using your upcoming presentation as a topic, write a press release which conforms to this format announcing your upcoming program. Your release should include, but is not limited to, the following information:
 - * What the topic of program is
 - * Who you will be speaking to
 - * Where the program will be held
 - * When it will be held
 - * Why the program is being held

Feel free to create or invent additional information that conforms to your topic and audience to fill in and add interest, if so desired.

3. Minimum length is three paragraphs.
4. This assignment is due on _____

**PUBLIC EDUCATION 1
COMMUNICATION**

ASSIGNMENT SHEET #3

TOPIC: Student Presentation

MATERIALS

NEEDED: Student Presentation Topic/Audience Assignment
Support materials as selected by student

INTRODUCTION: As a public educator, you will be required to give presentations on a routine, perhaps even daily, basis. You will be talking to both small and large groups with audiences of various ages and backgrounds. This assignment will give you an opportunity to gain some practical experience in delivering a presentation on a specified fire education topic to a selected audience.

ASSIGNMENT:

1. Review Communications Chapter in Student Manual, and student lecture notes.
2. The class will be divided into two fairly equal groups.
3. The instructor will have students draw at random for one of fifteen topics. Your assigned audience will also be identified at this time.

Your assigned topic: _____

Audience: _____

4. You will also draw at random with your group members for the order in which presentations will be given. No trades will be allowed.

Date of presentation: _____

Presentation number: _____

5. As a group member, you will perform in the role of each designated audience. The presenter must identify who the audience is at the beginning of his or her presentation. Please respond appropriately.

6. Your presentation must be **no shorter than _____ minutes and no longer than _____ minutes**. Successful completion of your presentation within these timelines is worth 10 points on the evaluation. A failure to adhere to these times, either under or over, will result in the loss of 10 points.
7. You must select at least one audio visual aid to use during your presentation.
 - * Posters, real objects, brochures, etc., can be used as they would during a regular presentation. Facsimiles of these objects will also be accepted since your classroom situation may not make actual materials available to you. The important thing for this class is that you demonstrate how you would use the material, not the quality of the material itself.
 - * Audio visuals such as movies, slide/tape programs, filmstrips, etc., should merely be introduced and concluded. In other words, you will not actually show the film or slides, but rather would introduce them and demonstrate how you would re-initiate discussion when it is over. We want to hear what you have to say, not what the film or tape says.
 - * Check with your instructor for the availability of such items as chalkboards, flip charts, bulletin boards, etc. It's good practice for a real life situation!
8. Grading will be based on your evaluation scores (See Assignment Sheet #4 on evaluations).

<p style="text-align: center;">#1</p> <p><u>TOPIC:</u> USE & OPERATION OF THE 9-1-1 EMERGENCY REPORTING SYSTEM</p> <p><u>AUDIENCE:</u> Fellow City Employees</p>	<p style="text-align: center;">#2</p> <p><u>TOPIC:</u> KNOW TWO WAYS OUT</p> <p><u>AUDIENCE:</u> 13-15 Yr. Old Babysitter Trainees</p>
<p style="text-align: center;">#3</p> <p><u>TOPIC:</u> STOP, DROP AND ROLL</p> <p><u>AUDIENCE:</u> Pre-School Children Ages 3 and 4</p>	<p style="text-align: center;">#4</p> <p><u>TOPIC:</u> CRAWL LOW UNDER SMOKE</p> <p><u>AUDIENCE:</u> Kindergarten Students</p>
<p style="text-align: center;">#5</p> <p><u>TOPIC:</u> COOL A BURN/BURN AWARENESS</p> <p><u>AUDIENCE:</u> Cub Scout Troop #323</p>	<p style="text-align: center;">#6</p> <p><u>TOPIC:</u> SMOKE DETECTOR INSTALLATION AND MAINTENANCE</p> <p><u>AUDIENCE:</u> Gold Jacket Realty Company</p>
<p style="text-align: center;">#7</p> <p><u>TOPIC:</u> COMMON FIRE HAZARDS IN THE HOME</p> <p><u>AUDIENCE:</u> Fifth Grade Students</p>	<p style="text-align: center;">#8</p> <p><u>TOPIC:</u> HOLIDAY FIRE SAFETY</p> <p><u>AUDIENCE:</u> Senior Citizens</p>
<p style="text-align: center;">#9</p> <p><u>TOPIC:</u> HIGH RISE FIRE SAFETY</p> <p><u>AUDIENCE:</u> XYZ Travel Club</p>	<p style="text-align: center;">#10</p> <p><u>TOPIC:</u> RESIDENTIAL FIRE PROTECTION SYSTEMS</p> <p><u>AUDIENCE:</u> City Council Members</p>
<p style="text-align: center;">#11</p> <p><u>TOPIC:</u> EARTHQUAKE/DISASTER PREPAREDNESS</p> <p><u>AUDIENCE:</u> Rotary Club</p>	<p style="text-align: center;">#12</p> <p><u>TOPIC:</u> HOW TO DEVELOP AND CONDUCT A FIRE DRILL</p> <p><u>AUDIENCE:</u> Pre-School Teachers</p>
<p style="text-align: center;">#13</p> <p><u>TOPIC:</u> FIRE EXTINGUISHER TRAINING</p> <p><u>AUDIENCE:</u> Employees of an Industrial Plant</p>	<p style="text-align: center;">#14</p> <p><u>TOPIC:</u> FIRE SAFETY IN THE URBAN WILDLAND INTERFACE</p> <p><u>AUDIENCE:</u> Canyon Country Homeowners Association</p>
<p style="text-align: center;">#15</p> <p><u>TOPIC:</u> DEALING WITH THE CURIOSITY FIRESETTER</p> <p><u>AUDIENCE:</u> S.C. Lincoln Elementary School PTA</p>	

**PUBLIC EDUCATION 1
COMMUNICATION**

ASSIGNMENT SHEET #4

TOPIC: Student Evaluations

**MATERIALS
NEEDED:** Evaluation Information Sheet
Sample Evaluation Form
Blank Evaluation Form

INTRODUCTION: Most public speakers rarely receive constructive criticism on their actual presentation techniques. Evaluation of your student presentation by your peers will provide you with such an opportunity. This information can make you a better speaker by identifying your strong points and offering suggestions on areas that need improvement. You will also learn a great deal by observing fellow educators in action and evaluating their programs and methods of presentation.

ASSIGNMENT:

1. Study the Evaluation Information Sheet and sample evaluation form.
2. Review lecture notes on "Components of an Effective Presentation."
3. Evaluate one student presentation.
4. Conduct a 5 minute class discussion on the presentation you are evaluating. Be sure to solicit comments from the group to gain consensus.

Be specific with your comments and make the discussion a constructive and positive learning experience for everyone in the group.
5. After the group discussion, complete an evaluation form. Be sure class comments are considered while scoring.
6. Submit the completed Evaluation Form to the instructor by the end of the day your evaluation takes place.

STUDENT INFO

TOPIC: HOW TO EVALUATE STUDENT PRESENTATIONS

INTRODUCTION:

Students participating in a program/demonstration will be divided into small groups. Each student in a group will take his turn as the EVALUATOR. The evaluator will not participate as a student but will serve as the observer and take notes as the lesson is being taught. The evaluator should make a special effort to identify ways in which the student-presenter might improve his use of presentation techniques, and specifically cite examples of the correct techniques used or overlooked.

INFORMATION:

What an Evaluation Should and Should Not Contain

The evaluator will lead the group in a critique of the lesson taught, following the program/demonstration, to develop a consensus evaluation. During the critique, the evaluator should read the notes of his observations to the group and encourage the other members of the group to add their comments on other important items they observed.

Evaluations should not contain statements that are broad value judgments, such as:

"He was good"

"Her use of visual aids was excellent"

"He displayed poor personal characteristics"

Evaluation statements should tell the student-presenter what the evaluator and the group observed concerning his techniques, but they should not state that his methods and techniques were "good" or "bad." A constructive evaluation is one that helps the student-presenter understand what he must do to improve his techniques of instruction.

Some of the questions an evaluator should consider when watching the student presentation are:

1. Did the presentation cover the topic?
2. Did the educator use correct terminology?
3. Was the educator prepared? Materials organized?
4. How was the presentation introduced?
5. How was the presentation concluded?

STUDENT INFO

6. Did the educator develop rapport and interest with the audience?
7. Did the presentation flow smoothly?
8. Were visual aids used effectively Did they add to, or distract from, the total presentation?
9. What there time for audience questions and feedback?
10. Components of an effective presentation:
 - Do not read from a script
 - Be familiar with the topic
 - Appearance is important
 - Enthusiastic and motivated
 - Be creative
 - Appropriate use of gestures
 - Eye contact with the audience
 - Quality of voice control
 - Absence of distracting mannerisms

The Evaluation Form

The evaluator has the responsibility of placing his thoughts and the group comments and observations on an evaluation form. The completed form is to be turned in to the instructor for grading purposes.

Both the evaluator and the educator will be graded on this exercise. A sample of a completed evaluation form appears on the following pages for your review and reference.

Grading Guidelines

There are two different grades that will be achieved during this evaluation process.

1. Presentation grade: This grade will be the total points accumulated on the evaluation form.
 - General program evaluation =150
 - Time requirement = 10
 - Use of audio visual = 10
 - Total Points =170
2. Your evaluation of a fellow student. This grade will be based on: 1) completeness of the form: 2) application of lecture information to student presentation evaluation; 3) presence of specific comments rather than broad value judgments.

Content/Presentation Points _____
 Use of Audio Visual _____
 Time _____
 Total Points _____

PROGRAM EVALUATION

PRESENTER _____ PRESENTATION TIME _____

TOPIC _____ AUDIENCE _____

EVALUATED BY _____ DATE _____

ASSIGNED TIME RANGE _____ MINUTES UNDER/OVER = 0 WITHIN RANGE = 10

USE OF AUDIO VISUAL COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

CONTENTS

INTRODUCTION COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

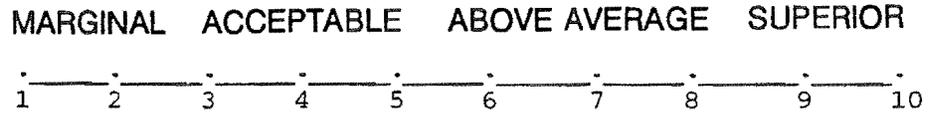
BODY COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

CONCLUSION COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

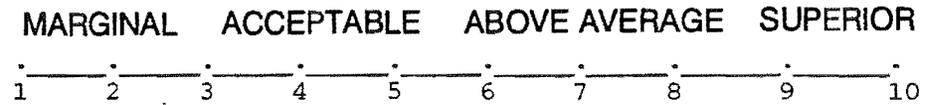
TOTAL POINTS PAGE 1 _____

PRESENTATION TECHNIQUE

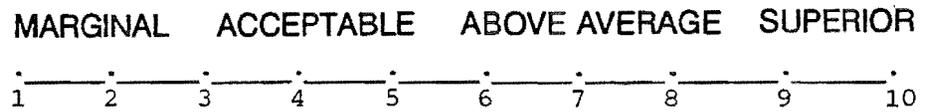
PREPARATION &
ORGANIZATION
COMMENTS:



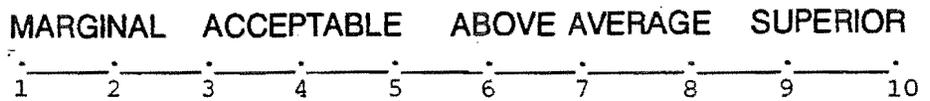
QUESTIONING
TECHNIQUES
COMMENTS:



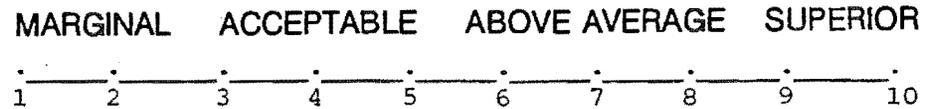
FAMILIARITY
WITH TOPICS
COMMENTS:



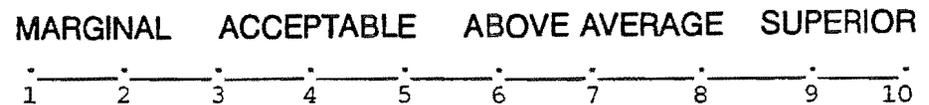
ENTHUSIASM
COMMENTS:



CREATIVITY
COMMENTS:



USE OF GESTURES
COMMENTS:



PRESENTATION TECHNIQUES (CONTINUED)

ABSENCE OF
DISTRACTING
MANNERISMS:
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
1 2 3 4 5 6 7 8 9 10

VOICE CONTROL -
RATE/VOLUME/PITCH
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
1 2 3 4 5 6 7 8 9 10

AUDIENCE RAPPORT -
EYE CONTACT,
EMPATHY, ETC.
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
1 2 3 4 5 6 7 8 9 10

AGE/GROUP
APPROPRIATENESS
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
1 2 3 4 5 6 7 8 9 10

GROUP EVALUATION
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
2 4 6 8 10 12 14 16 18 20

TOTAL POINTS PAGES 2 & 3 _____

SAMPLE ONLY

Content/Presentation Points 116
Use of Audio Visual 9
Time 10
Total Points 135

PROGRAM EVALUATION

PRESENTER MARY BEGOOD PRESENTATION TIME 3:00 PM
TOPIC SMOKE DETECTOR MAINTENANCE AUDIENCE GOLD JACKET REALTY
EVALUATED BY EDWARD BETTER DATE AUGUST 5, 1988
ASSIGNED TIME RANGE _____ MINUTES UNDER/OVER = 0 WITHIN RANGE = 10

USE OF AUDIO VISUAL MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
COMMENTS:

1 2 3 4 5 6 7 8 9 10
THE POSTER GREATLY CLARIFIED THE STEPS FOR DETECTOR MAINTENANCE. GOOD ADDITION TO THE PROGRAM. THE AUDIO VISUALS WERE SMOOTHLY INTRODUCED; APPEARED TO BE WELL-REHEARSED.

CONTENTS

INTRODUCTION MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
COMMENTS:

1 2 3 4 5 6 7 8 9 10
TOPIC AND SUBJECT AREA WELL DEFINED. NEEDED MORE PERSONALIZATION FOR THE AUDIENCE AT HAND. ALSO SEEMED TO MOVE ABRUPTLY FROM INTRO TO BODY.

BODY MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
COMMENTS:

1 2 3 4 5 6 7 8 9 10
EXCELLENT COVERAGE OF FACTS RELATING TO MAINTENANCE AND TESTING OF DETECTORS. PRESENTER WAS COMFORTABLE WITH THE TOPIC & FLOWED SMOOTHLY FROM ONE POINT TO THE NEXT.

CONCLUSION MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
COMMENTS:

1 2 3 4 5 6 7 8 9 10
REALLY ENCOURAGED QUESTIONS FROM THE AUDIENCE DID NOT APPEAR OVERLY ANXIOUS TO CONCLUDE PROGRAM BUT LET IT DRAW TO A NATURAL CONCLUSION. THERE SEEMED TO BE A LACK OF A CONCLUDING COMMENT.

TOTAL POINTS PAGE 1 22

PRESENTATION TECHNIQUE

PREPARATION &
ORGANIZATION

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR

COMMENTS:



VERY PREPARED. NO FUMBLING WITH MATERIALS. SET AND MAINTAINED A PROFESSIONAL ATTITUDE.

QUESTIONING
TECHNIQUES

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR

COMMENTS:



ENCOURAGED QUESTIONS BOTH VERBALLY AND THROUGH MANNERISMS. ANSWERED QUESTIONS IN A DIRECT, TO-THE-POINT MANNER.

FAMILIARITY
WITH TOPICS

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR

COMMENTS:



PRESENTER SEEMED VERY COMFORTABLE WITH THE SUBJECT MATTER. FLOWED SMOOTHLY FROM ONE POINT TO THE NEXT.

ENTHUSIASM
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR



PRESENTER SEEMED PLEASED TO BE GIVING THE PRESENTATION. HER ENTHUSIASM GRADUALLY FLOWED TO THE AUDIENCE.

CREATIVITY
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR



THE AUDIO VISUAL POSTER ADDED TO THE PROGRAM. THE PROGRAM AS A WHOLE APPEARED TO BE VERY "CANNED" AND LACKED THE PERSONAL TOUCH TO MAKE IT MEMORABLE.

USE OF GESTURES
COMMENTS:

MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR



STIFF AND FORMAL AT BEGINNING, BUT RELAXED DURING BODY OF PRESENTATION. CLEARLY EMPHASIZED MAJOR POINTS. GOOD USE OF GESTURES DURING QUESTION & ANSWER PERIOD.

PRESENTATION TECHNIQUES (CONTINUED)

ABSENCE OF DISTRACTING MANNERISMS: COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

DIDNT NOTICE ANY DISTRACTING MANNERISMS.

VOICE CONTROL - RATE/VOLUME/PITCH COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

EXCELLENT VOLUME. SEEMED TO "GET IN A RUT" DURING THE BODY OF THE SPEECH, POSSIBLY BECAUSE IT WAS TOO WELL REHEARSED (OR CANNED).

AUDIENCE RAPPORT - EYE CONTACT, EMPATHY, ETC. COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

COULD HAVE FOCUSED ON THE AUDIENCE NEEDS AND BACKGROUND MORE. GOOD EYE CONTACT. WARMED UP TO AUDIENCE AT THE END.

AGE/GROUP APPROPRIATENESS COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 1 2 3 4 5 6 7 8 9 10

SPOKE AT A COMFORTABLE AND APPROPRIATE LEVEL FOR PROFESSIONAL ADULTS.

GROUP EVALUATION COMMENTS: MARGINAL ACCEPTABLE ABOVE AVERAGE SUPERIOR
 2 4 6 8 10 12 14 16 18 20

ALTHOUGH SOME AREAS WERE NOT AS STRONG AS DESIRED, GENERALLY THE PRESENTATION WAS EFFECTIVE. THE TRANSITIONS FROM INTRO TO BODY WERE ROUGH. QUESTIONS WERE FIELDDED WELL AND SPEAKER MANNERISMS ENCOURAGED AUDIENCE PARTICIPATION. THE GROUP FELT THAT IT WAS A LITTLE TOO WELL REHEARSED BUT THAT THE SPEAKER WOULD BECOME MORE RELAYED WITH ADDITIONAL PRACTICE. TOTAL POINTS PAGES 2 & 3 94

TOTAL POINTS PAGE 1 22

TOTAL CONTENT/
 -B14- PRESENTATION
 POINTS

116

**PUBLIC EDUCATION I
COMMUNICATION**

ASSIGNMENT SHEET #5

TOPIC: Activity Report

MATERIALS

NEEDED: Student Presentation Topic/Audience
Activity Report Form

INTRODUCTION: One of the most important, yet often neglected aspects of a public educator's job is good record keeping. Records of past activity are vital to determining community needs as well as providing support data on job performance. This assignment will provide you with an opportunity to complete a sample Activity report which records for later reference vital information on public contact and involvement.

ASSIGNMENT:

1. Review sample Activity Report.
2. Prior to giving your student presentation, complete Sections 1 and 2 of the Activity Report.
 - * List any special circumstances about your location, audience, or program in Section 1.
 - * Complete a list of required materials in Section 2. This can be used for reference at the time of your presentation.
3. At the conclusion of your presentation, complete Section 3 of the Activity Report, including signature and date.
4. Submit completed Activity Report to your instructor no later than the end of the day your presentation is completed.
5. Points may be deducted for failure to submit this report on time.

PUBLIC EDUCATION ACTIVITY REPORT

SECTION 1

Program Requested: _____

Location: _____

Group: _____ Projected Attendance: _____

Requested Date: _____ Time: _____

Alternate Date: _____ Time: _____

Contact Person: _____ Phone: _____

Address: _____

Special Instructions: _____

Date Received: _____ Signature: _____

* * * * *

SECTION 2

Program Confirmed For: Date: _____ Time: _____

Placed on Master Calendar By: _____ Date: _____

Personnel to Handle: _____

Equipment Needed: _____

* * * * *

SECTION 3

Program Was: Completed []
Not Completed [] Why? _____

Hours: _____ Attendance: _____

Personnel Involved: _____

Comments: _____

Signature: _____ Date: _____

PUBLIC EDUCATION ACTIVITY REPORT

SECTION 1

Program Requested: SMOKE DETECTOR MAINTENANCE

Location: GOLD JACKET REALTY 1311 LONGVIEW RD

Group: EMPLOYEES Projected Attendance: 25-30

Requested Date: TUES. AUG 5 1988 Time: 12:30 PM

Alternate Date: TUES. AUG. 12, 1988 Time: 12:30 PM

Contact Person: JOE FETTERS Phone: (213) 731-5291

Address: 1311 LONGVIEW RD.

Special Instructions: RELATE PROGRAM TO STATE REQUIREMENTS
GIVE SPECIFICS ON DETECTOR MAINTENANCE
AND TESTING.

Date Received: JULY 3, 1988 Signature: Mary Begood

SECTION 2

Program Confirmed For: Date: TUES. AUG. 5 Time: 12:30 pm

Placed on Master Calendar By: M.B. Date: JULY 8, 1988

Personnel to Handle: FIRE PREVENTION - MARY BEGOOD

Equipment Needed: 16MM PROJECTOR/SCREEN/EXTENSION
CORD/SAMPLE DETECTOR/BROCHURES

SECTION 3

Program Was: Completed [X]
Not Completed [] Why? _____

Hours: 2.0 Attendance: 23

Personnel Involved: MARY BEGOOD

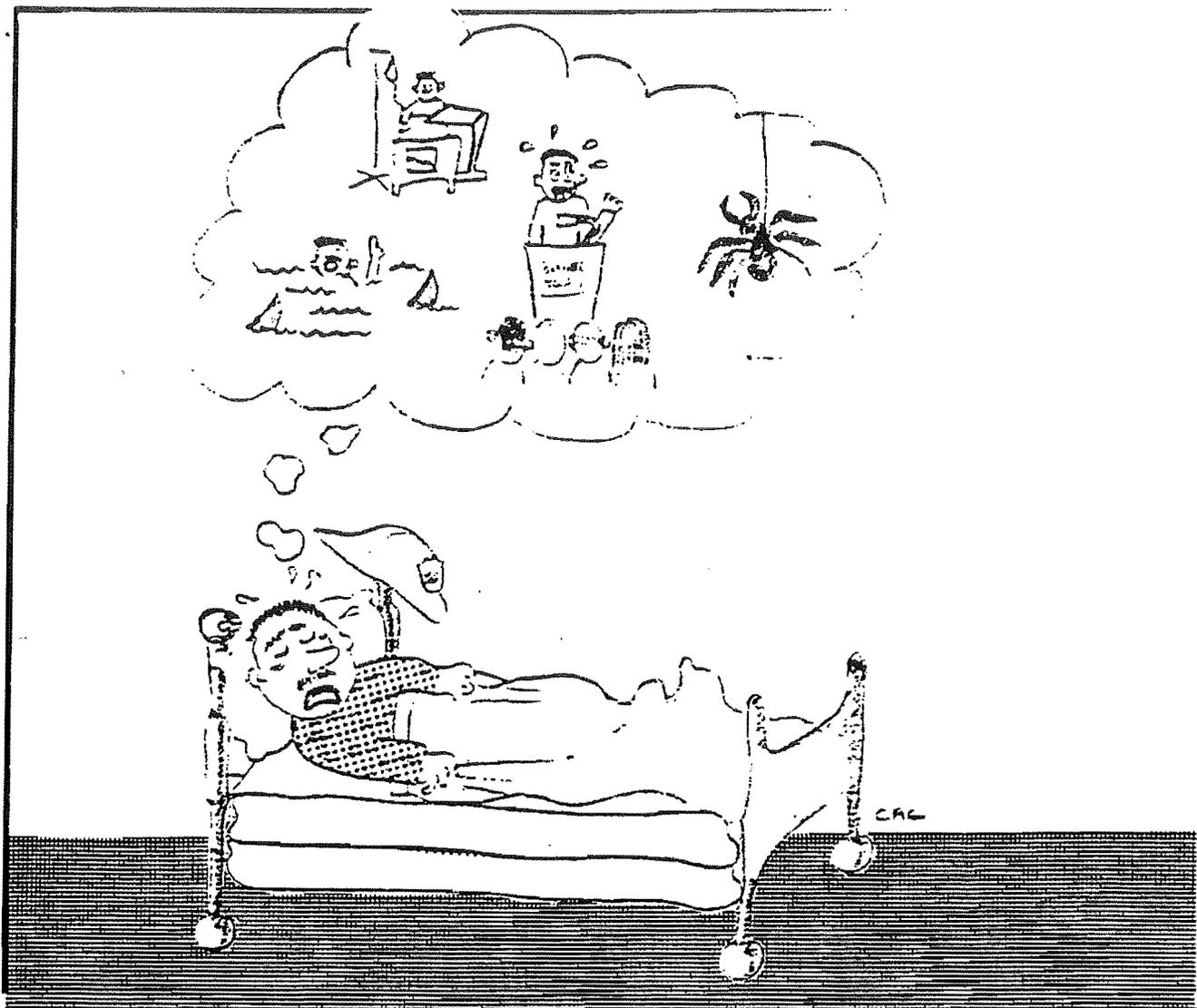
Comments: GROUP WAS VERY RECEPTIVE. HAD MANY
QUESTIONS ABOUT TESTING. GOOD PROGRAM!

Signature: Mary Begood Date: Aug. 5, 1988

APPENDIX C

Supplemental Information





Public Speaking for the Fire Service: A Survival Guide

EXECUTIVE SUMMARY

It may strike terror into most of us, but public speaking is one of those bugbears that must be mastered in order to get ahead in the fire service — or any other professional career.

By JANICE PETERSON

Speaking before a group, heights, bugs, financial problems, deep water, sickness, and death. What do these objects and situations have in common? In the order listed, these are the seven greatest fears named by 3,000 Americans in a *Book of Lists* survey. Public speaking was named as the ultimate anxiety by 42 percent. Only 19 percent listed death.

You may very well be one of those who would rather die than do it, but who must speak in public on occasion.

You may not consider yourself embarrassingly bad, in fact you sometimes think you deserve those overly-sincere compliments from associates. Maybe even, once in a while, you feel nearly competent — even brilliant — but you haven't a clue as to why your speaking effectiveness can't be predicted any more reliably than the weather.

However, it is possible to be a consistently effective public speaker and even learn to control stagefright. Attention to the basics of **planning**,

practice, and presentation will put you confidently in front of an audience and greatly increase the likelihood of successful communication.

THE PLANNING STAGE

1. **Think about your speech topic** from a variety of perspectives. If some flexibility in approach is possible, explore different ways of handling the material. Don't be afraid to be creative.

2. **Think about your audience.** Who will be hearing your speech? How many listeners? Under what circumstances? (Ceremonial occasion, "roast," training, entertainment, etc.). Consider also, the audience's level of expertise on the subject and its attitude towards you and your subject. Do you anticipate any hostility? Does your speech topic have significant boredom potential for this audience? Is the audience going to feel initially positive?

3. **Consider other elements of the speaking situation.** The time of day matters. Listeners get sleepy after they eat lunch or dinner. Audiences are more alert in the early morning. Are there other speakers on the program? Do you have a time limit? One of the worst sins speakers commit against captive listeners is overstaying their welcome.

4. **Research your topic.** In almost every case, it is advisable to explore resources beyond the confines of your own experiences. We tend to think so well of our ideas that we can't imagine what else needs to be said. Often, a speaking occasion demands more. What other supporting information can you find? A provocative illustration, a powerful example, a pithy quotation, a funny story? A well-prepared speaker collects at least twice as much material as will actually be used in the speech. A key to combatting nerves is to know your subject extremely well. Listeners are extremely perceptive in detecting empty talk and attempts to substitute charm for substance.

5. **Edit and organize your material.** Before you make another move, ask yourself, "What is my central purpose?" You should be able to write it down in one sentence. Be specific. Instead of, "I'm going to talk about management styles," which is too broad, try, "I will explain the advantages and disadvantages of five management styles ranging from autocratic to democratic."

Once you have developed a central purpose, organize your material under main points. Each main point should directly illustrate or prove the central purpose. Support each main point with

examples, statistics, expert opinion and other materials.

• **Ways to organize the body of the speech.** The **chronological** format structures points in a time sequence. The **spatial** format looks at geographical placement of items covered in the speech. A **topical** format is useful when the central theme seems to fall into logical divisions (such as the five management styles). A **problem-solution** framework is sensible when you have a challenge to be confronted, something to be solved.

6. **Design the speech introduction.** An introduction should get the audience's attention, provide orientation on the speech topic, and preview the main ideas to be covered. An added goal is to establish your credibility on the subject under discussion.

7. **Design the speech conclusion.** The conclusion should emphasize the central purpose, summarize main points and give the audience a good sense of closure.

"A wise man once said, 'The brain is to think. The mouth is to talk. In that order.'"

8. **Write an outline of the speech.** Print/type in capital letters on note cards or standard-size typing paper. (Most speakers have preferences on paper size.) Sheaves of flimsy paper can be difficult to manage and distracting for listeners. Do not write out a manuscript word for word and plan to read it aloud. In almost every situation, audiences detest being read to. A speech is not an essay standing on its hind legs.

THE PRACTICE STAGE

1. **Think about your audience some more.** Imagine yourself delivering the speech. Think positively, with a feeling of anticipation rather than dread. Consider your outline as objectively as you are able. Does it need further re-write? Study your outline until the ideas feel comfortable and you can anticipate what is on the next card.

2. **Start practicing aloud.** If you don't trust any of your colleagues to listen with a straight face, practice alone, preferably with a lectern but definitely on your feet. Speaking to a mirror works well for some people but others find the experience too hilarious to be useful. Do not try to memorize exact wording. Memorization is dif-

ficult and could have catastrophic consequences during the speaking event if you lose your train of thought. This type of delivery allows virtually no flexibility in adapting to the dynamics of the speaking situation. Audiences tend to react badly because the memorized delivery is obvious when speakers pause, look stricken and roll their eyes at the ceiling. These behaviors make listeners tense and distracted.

3. **Rehearse extemporaneously, that is, with notes and verbal flexibility.** Allow yourself to use varied language each time you rehearse. Speak clearly and with good volume. Let yourself gesture in natural accompaniment to the words. If you practice the speech with gestures and movement, you will feel less like a fence post when you actually bring your ideas to the public forum.

Rehearse in accordance with your time limits, but do not underestimate the importance of practice. You will

feel a little silly but don't worry about that. Do it.

THE ACTUAL PRESENTATION

1. **Get a good night's sleep the night before. No wild parties!**

2. **If you have enough advance notice, try to schedule an otherwise-low-stress work day.**

3. **Avoid caffeine and other stimulants in the hours preceding the speech.**

4. **"Psych up."** Remind yourself that you are well prepared with material the audience is fortunate to hear. Think well of your hearers. The chances are excellent that if you present yourself with friendliness and interest, they will respond in kind.

As you begin your speech:

• **Look at your audience,** take a second to get comfortable, and take a breath. No hyperventilating — just a refreshing pause.

• **Speak in a calm, unhurried, natural manner.** You've been rehearsing your delivery, so you will be fine. Don't rush. Don't be afraid to pause. Many speakers are scared witless by a little dead air. You need not and should

Continued on next page



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SPEAK . . .

Continued from page 41

not be intimidated by pauses. They provide time for the audience to internalize important points and allow you time to gather your thoughts.

- **Maintain visual contact with your audience.** Concentrate on the alert listeners who are nodding their heads, smiling and generally looking receptive. Ignore the ones who are nodding off.

- **Stick to your outline. Don't ramble.** If you are suddenly reminded of a lengthy but funny story, do not tell it. Maintain flexibility and adaptability in language, but never lose sight of your objectives or your basic outline. A wise man once said, "The brain is to think. The mouth is to talk. In that order." You owe your audience the benefit of well-thought-out ideas.

- **Use language that feels right to you** without being overly casual, or, at the other extreme, pompous and bloated. Remember that speech should be used to instruct, not to impress.

- **If you make a mistake, lose your place, etc. it is not the end of the world.** Get back on track and don't let it throw you. Speakers are expected to

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be human. Do not apologize. Do not make excuses. Very often, audiences will not even be aware of the problem.

• **Complete your speech within the time limits you anticipated.** As you conclude, look at your audience, and end the speech firmly and conclusively. Keep the volume up. Don't let it trail off. Do not rush your conclusion.

A FEW NOTES ON STAGEFRIGHT

1. **You are not alone.** Almost every speaker feels the same tension. It is a natural response to what is perceived as a threatening situation. The body releases adrenalin which produces constructive tension. You are much more alert under stress.

2. **Tension subsides with movement.** Use your body for gesture and movement. Use the power in your voice with strong volume and expression.

3. **You will notice the manifestations of tension more than the audience will.** Console yourself with this thought and the further observation that your listeners are interested in what you have to say. Your understandable ego involvement will lessen if you let yourself be other-oriented rather than self-absorbed.

4. **Rapid delivery increases tension.** A slower rate and the inclusion of pauses, decreases tension.

5. **Good posture reduces tension.** Stand up straight.

If you have prepared your ideas and rehearsed them, you should be able to control tension well. Remember though, that public speaking is an art as well as an acquired skill. It takes practice and attention to detail. If you want to be an effective public speaker, the goal is within your reach.

ICS . . .

Continued from page 6

mand System (NIIMS). ICS would, with modification, become the on-scene management structure of NIIMS.

IEMS became public in 1983, when the Federal Emergency Management Agency proposed implementation of a multi-agency and multi-jurisdiction emergency preparedness plan that would improve capabilities of all agencies at the national, state and local levels.

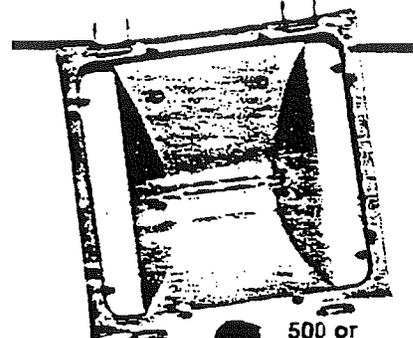
The IEMS method of management recognizes that certain functions are common to all emergencies. IEMS is designed to address emergency planning and capabilities with the primary objective being the development of detailed emergency preparedness plans. These plans are to be so designed that the performance of local officials should improve during large-scale emergencies calling for the mobilization of the numerous emergency agencies and resources. It should be stressed that IEMS does not replace ICS as the primary organizational structure for on-scene management, but is designed to enhance the performance of agencies using ICS by integrating political, private and normally non-emergency entities into a cohesive management team.

What will ICS look like in the future? That is a difficult question to answer because each innovation has brought with it some minor changes. However, the basic concept behind ICS has not changed since inception and it is doubtful that it will in the future.

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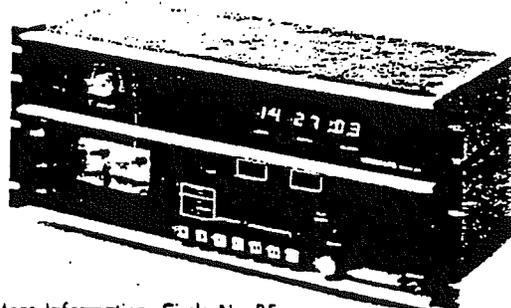
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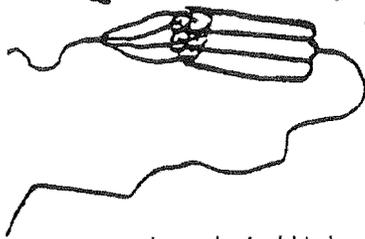
Is Anybody Listening? The Fine Art of Communication in the Workplace

Part 5

Giving in to the fear of speaking before a group will prevent the ambitious fire service officer from reaching his goals. This month's communication article discusses the philosophy of public speaking, both at the assessment center and in the workplace.

By PATRICK T. MAHER
AFJ Correspondent

LISTENESS



Sweat bathed his brow. The veteran firefighter was facing the most terrifying experience of his long and honorable career.

As his life flashed before his eyes, he wondered if that recent promotion to battalion chief that forced him to confront this event worse than death was worth it. His breath came in short spurts, and he almost welcomed the prospect of the peace and tranquility that unconsciousness would bring.

Taking a deep breath, he struggled to his feet, staggered to the center of the room and began his speech.

Is the above scenario frighteningly familiar? Or, unlike our brave firefighter, are you one of the many who so fear public speaking that they'll go to any lengths to avoid it?

While the fear of speaking in front of a group is natural and pervasive, the fire service member who seeks to advance should take action as soon as possible to become a confident, adept public speaker. A successful speaker becomes the logical leader in almost any group, thus, the individual who seeks to become a leader must learn to appear self-assured in front of a group.

Another reason public speaking is so important is that it is essential to selling, whether the product being sold involves goods, services, fund-raising or fire prevention. Salesmanship — or persuading others to accept your perspective or wishes — is largely a matter of public speaking.

Another important reason for becoming a good public speaker is that speech training develops personality. Latent abilities are discovered and life interests broadened through sharing ideas with others.

Those who have attained or aspire to attain executive and command positions in public service will find themselves frequently called upon to ad-

dress large audiences, often with little or no opportunity for preparation. Since these situations can rarely be avoided it's best to accept this responsibility and prepare for it.

BUILDING SPEAKING CONFIDENCE

Anyone fearing public speaking should first recognize that it is natural to have instinctive fear of all new experiences, whether it be applying for a first job, making a first (or for that matter any) proposal of marriage or facing your first major fire. One way of overcoming fear is to articulate what the fear is, and recognize that, like most fears, those dealing with public speaking have little merit.

Fear and nervousness are almost always assuaged by practice and repetition. All people experience some sort of fear and panic when faced with new experiences, but the successful speaker, or, indeed, the successful person in any situation, wins by using the fear's energy for constructive purposes.

Anyone with any length of time in the fire service has experienced a number of dangerous and fearful situations. Most, however, when faced with similar situations in the future, will automatically respond with the correct actions. They are not letting fear master them: They are mastering the fear.

The same principle applies in learning to be a proficient public speaker. The single-strongest reason people shy away from speaking in public is the fear of facing the audience. While this fear may remain for several speeches, it really is reduced gradually, through repetitive practice. One of the best ways of gaining this practice, as well as obtaining extremely helpful critiques of your public speaking is by joining a public speaking club called the Toastmasters. You can find the listing for this club in your local directory.

In addition to obtaining practice, you can control audience phobia by knowing your subject and knowing that you know the subject. Another problem, nervous mannerisms, can be overcome by using the physical and mental forces that cause knees to shake and the voice to quiver as a motivator. Finally, when the speaker is truly earnest about his subject matter, he will forget himself in his fears and lose himself in the speech.

No discussion of public speaking is complete without noting that even the

most successful, experienced speaker always has some apprehension before starting his speech. Indeed, any speaker who does not feel some degree of fear is likely to be boring, uninteresting and monotonous.

KINDS OF FEAR

The most common fear, physical fear of the audience, is totally misplaced because it is highly unlikely that the audience will physically attack the speaker. Therefore, physical fear of the audience is totally unfounded.

The next most common fear is the fear of ridicule. While a speaker may be heckled, especially if the audience disagrees with what's being said, it is extremely rare to be publicly ridiculed. If the speech is well done, it will command respect.

Closely aligned to the fear of ridicule is the fear of making a spectacle of oneself. Again, this fear is misplaced. The person who makes an honest effort to prepare his speech is unlikely to make a spectacle of himself. The person who does not prepare, or who thinks he is so good he doesn't need to, is the one who will make a fool of himself.

Another common fear, also misplaced, is that what you have to say is not worth saying. However, the very fact that you have been asked to make the speech indicates that the topic is worthwhile. You know that you have something to say, and the audience will be convinced also, if you speak with authority and conviction.

A final fear is that you may bore the audience. Be assured that an audience can stand a lot of punishment, and even if you do bore them, you will not be the first, and you certainly will not be the last to do so. But, again, if you have prepared, know your material and state it directly and with conviction, they will not be bored. In fact, the two situations most likely to bore an audience are when the speaker simply reads a speech, and when the speaker rambles on endlessly. As long as you have organized your remarks and only glance occasionally at your notes, you are unlikely to be a bore.

VISUAL AIDS

It is not always necessary to use visual aids, but it is a good idea to use them whenever feasible. Any time you use statistics, considerable data, or complicated information, visual aids should be considered. Visual aids need not be extensive, nor do they have to be expensive.

Continued on next page

COMM . . .

Continued from page 29

Properly developed, charts, illustrations or slides can serve as the speaker's notes. They visually outline the major elements of the speech, as well as give the audience something to focus on (other than the speaker!).

It is important, however, to be able to use visual aids effectively. It is common for the inexperienced speaker to look at and speak to the visual aid itself, losing all contact with the audience. It is especially amateurish to write on or prepare the visual aid during the speech. Except in a classroom situation, the visual aid should always be prepared ahead of time, not during the presentation itself.

ORAL PRESENTATIONS AND THE ASSESSMENT CENTER

Because public speaking is an important element of so many management and supervisory positions, most management-level assessment centers will have an oral presentation exercise. For the assessment center, oral presentation ability is most commonly defined as:

Ability, in a formal setting, to orally communicate both accurately and clearly information, ideas, conditions

and needs to others, given time for preparation. (Includes nonverbal gestures and use of aids where appropriate.)

It is important to note that the assessment center definition of oral communication skill includes time for preparation. Other kinds of oral presentations, on the other hand, may allow time for preparation, but can also include extemporaneous speaking, such as group discussions and interview situations.

In a properly-developed assessment center, the primary focus in the oral presentation exercise is on delivery, with speech content usually secondary or not even considered for evaluation purposes. That is, how you say something is more important than what you say, though what you say is still as important and can greatly impact delivery.

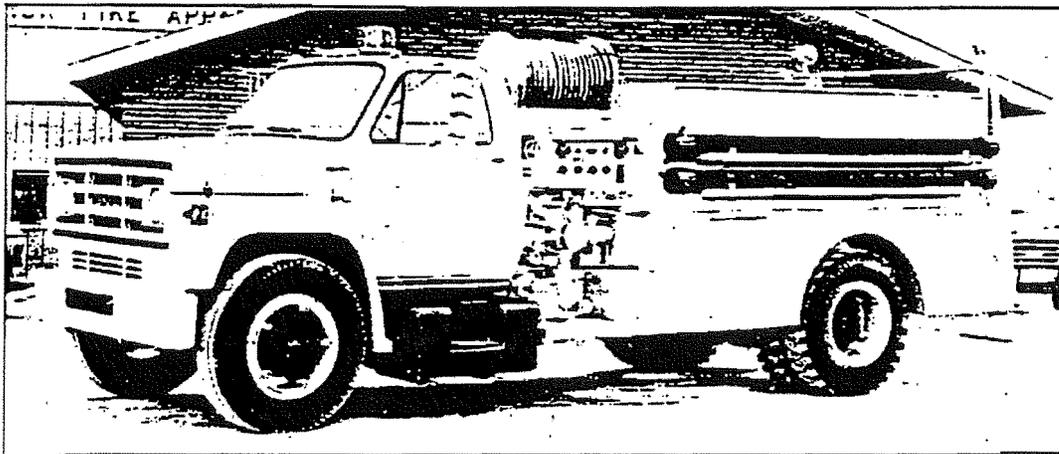
In the assessment center, it is important for the participant to demonstrate the attributes of a good public speaker. It is best to prepare an outline and place it on 3 X 5 cards, rather than attempt to write the entire speech in narrative form. By using cards, the speaker will be less likely to read the speech.

It is also important that, whenever possible, visual aids be used in the as-

essment center oral presentation. Since assessors are primarily concerned with determining whether or not the participant is aware of the importance of visual aids and can use them properly, it is only necessary to demonstrate this awareness. The visual aid should, if at all possible, be prepared in advance of the presentation, during the preparation time. Making brief references to the visual aid during the presentation itself is usually sufficient to demonstrate awareness of the importance of the visual aid and its appropriate use. However, remember to avoid talking to the visual aid during the presentation.

While time constraints are always important, they are especially important in the assessment center. Staying within a predetermined length imposes strict scheduling, and scheduling skills are extremely important in the assessment center. Whatever time limit is imposed by assessors, it is absolutely imperative to adhere to that time limit. To be sure that you stay within limits, it is a good idea to invest in a digital watch or stopwatch. The watch can then be placed on the podium, where you can easily refer to it to determine how much time is remaining. If you find yourself too far behind — a com-

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mon occurrence — skip over some parts of your speech and attempt to close it within the established time limit. It is also a good idea to periodically write "time?" in your notes. This will serve as a reminder to check the watch to see how much time you have remaining.

SUMMARY

Public speaking, one of the most feared of all human experiences, is a given for anyone desiring to succeed as an executive in the fire service. Seeking to avoid the public speaking experience will not help you in the long run. It will only delay the inevitable, and prevent you from attaining the experience you need to become a success.

GUEST...

Continued from page 26

Can you imagine what any other organization would give to be able to personally talk with every school child in the community?

Our profession has these opportunities, and any department not making full use of them is not doing its job. Let's quit kidding ourselves that the glamorous headline-grabbing programs can do it alone. The guts of a productive public education campaign lie in a full-time well-structured program, participated in by every member of the fire department.

There is a story about a man who lived by the side of the road and sold hot dogs. He was hard of hearing so he had no radio. He had trouble with his eyes so he read no newspapers. But he sold good hot dogs.

He put up signs on the highway telling how good they were. He stood by the side of the road and cried, "Buy a hot dog, mister," and people bought. He increased his meat and bun orders. He bought a bigger stove to handle his business. He brought his son home from college to help him.

But then something happened. His son said, "Father haven't you been listening to the radio? There's a depression on!" The European situation is bad. The situation is terrible in the Far East. The domestic situation is even worse."

Whereupon the father thought, well, my son has been to college. He reads the papers and listens to the radio and he ought to know. So the father cut down on his meat and bun orders. He took down his advertising signs. He no longer bothered to stand out on the highway to sell hot dogs. And his hot dog sales fell off almost overnight.

"You're right, son," the father said to the boy. "We certainly are in the middle of a depression."

No matter what anybody tells you, we can never quit advertising and selling our product, or we will be in the middle of a terrible depression, and the terrible fire-related statistics will continue.

There are many support groups developing. Work with these new groups. Participate in their organizations.

Every chance you get, educate the public and *every day* educate your personnel. Fire-fighting personnel are the key to complete success. Don't give up — let's get them off their "bleep bleeps."

— Mike Brown, Chief
King County (WA) F.P.D. #4

BOOKS...

Continued from page 7

tions Clerk, University of Colorado Institute of Behavioral Science, Campus Box 482, Boulder, CO 80309. (303) 492-1410.

Photo Book Depicts NY Fire Scenes

Where's the Fire? Indeed. Judging by a recently-released book by that name, the fire is in New York City. This softcover volume by FDNY fire dispatcher Warren Fuchs contains both black-and-white and color photos of big fires in factories, big fires in tenements, big fires in restaurants... You get the picture. And so did Fuchs.

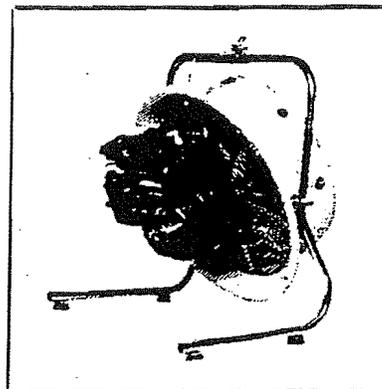
An excellent photographer, Fuchs has managed to capture both the awesome power of fire in huge proportions and the human drama and tension of its combatants and victims.

Where's the Fire? by Warren Fuchs, Jr. \$19.95 from Quinlan Press, 131 Beverly St., Boston, MA 02114. (800) 551-2500.

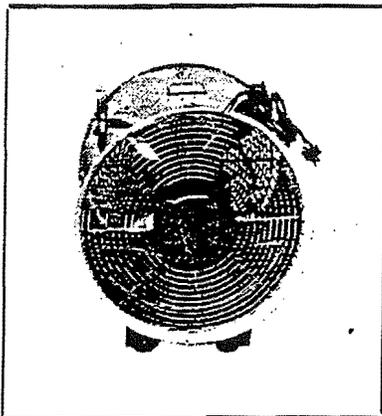
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BONUS ITEM

How to Produce Low-Cost, Do-It-Yourself Displays

By Nancy Morse

Displays permit an organization to reach an external audience with an effective message. They can be used to supplement those specially prepared programs, brochures and tours for any of the following activities:

News conferences, health fairs, open houses, voting days, anniversary celebrations, recognition programs.

Why They Work

Most special events create a captive audience. Whenever a group of people stand around in your lobby waiting for something to happen — a tour to start, a voting booth to open, a speaker to appear — they look for something to occupy their time. Rather than stare at a wall, they'll probably read your message.

Displays also offer three benefits. They:

- **Command attention.** The finished unit, as well as the graphic elements used to cover it, is large and colorful. It will attract the eye.
- **Imply importance.** Because a large area is devoted to a single subject, the message is perceived as one of consequence.
- **Are instantly comprehensible.** Complicated data — what the consumer dollar buys, for instance — can be condensed to a graphic anyone can understand.

Planning: The First Step

■ **What is the Message?** Decide what you want to say and how best to illustrate it. Limit the message to a single concept. Do not try for a multiple theme and do not try to say everything there is to say about your subject.

■ **What kind of space, time and money do you have?**

If you can afford modular Fiberglass units, chrome frames and lighted panels with a running slide show, read no further. You can hire a design professional to construct the unit.

However, this alternative is not always feasible or practical; nor does every display theme warrant such a presentation. Sometimes the "plain old bulletin board" will have to do.

Survey your surroundings. Perhaps there's a bulletin board in the cafeteria. Or maybe there's an empty wall in the board room or foyer for hanging a panel (made from the two pieces of heavy cardboard you've been storing in the closet for six months). Then again, sometimes all you really need is an easel or two for propping boards.

■ **Gather your display materials.** What kind of visuals will illustrate your message — photographs, floor plans, maps, charts, graphs? Visuals are the most important display element; spend the time to make them as attractive as possible.

If you are using photographs, be sure they are sharp and clear when enlarged. Maps and charts must be used the way they come, but perhaps should be mounted on stiff paper or cardboard for a better appearance.

For your headlines, you can choose from vinyl letters or carbon transfer letters, both of which come in large sizes and are attractive. Avoid hand lettering or stencil lettering.

Layout and Design

Combining visual and type elements on a display surface is much the same as designing a printed page — and just as important. You can't just thumbtack brochures to a bulletin board and expect the layout to work.

■ **Visuals** are most pleasing when rectangular. Stay away from irregular, angular or circular shapes. Also, think large: Photographs should be no smaller than 5" x 7" (Polaroid snapshots are real no-nos).

■ **Type** must be both attractive and legible. A sans serif typeface looks cleaner and is easier to read. Don't use anything smaller than ½-inch and play it safe with proven legibility combinations; black letters on yellow

or white paper, or blue, red or green letters on white paper.

Headlines work best when placed at eye level. Vertical or diagonal positioning is hard to read.

A Word About Color

Use color in your display. Color stimulates the eye and the imagination and can enliven even the most ordinary collection of black and white photographs. Adding color to a display is quite simple — and less costly than adding color to a publication. Type, photographs and background papers are easily available in most basic colors.

However, color should be used with care. Used irresponsibly, color is worse than no color at all. Take time, then, to understand the basics of color theory.

■ **Warm Colors** are the tones of heat and light: red, orange and yellow. Red, the most powerful color, brings to mind life, action, vitality, passion, anger, love, blood, fire and overextended budgets. Orange, in a softer way, also conjures up images of warmth and sun and is particularly associated with autumn elements such as pumpkins, harvest moons and Halloween. Yellow is the most exciting hue and calls to mind fall, summer, sunshine, daffodils, and circuses.

Warm colors emit exciting tones. On a design surface, they come forward, demand attention from and stimulate the viewer.

■ **Cool Colors**, on the other hand, are the colors of earth and water: blue, green and purple. Blue is the coolest and most peaceful color — connoting serenity, loyalty, honesty, faith, patriotism, sky, sea, ice, winter, cold and sometimes even depression. Green also has a tranquilizing effect, reminding us of trees, leaves, grass, spring, youth, St. Patrick's Day, and — in a negative vein — witches' faces, monsters' skin and Medusa's hair. Purple, predominantly connected with royalty, means dignity, seriousness and sublimity. (However, be aware that some people find purple offensive.)

On a design surface, cool colors will recede, exerting a subduing, calming influence on the viewer.

■ **Neutral Colors** — black, white, brown and gray — generally have no strong associations. These are the colors popularly known to "match" any other color.

■ **Color Combinations** should also be chosen with care. The rule of thumb is that the more *alike* colors are (the closer they are on the color wheel), the more calm the effect of their combination will be. Orange and yellow, green and blue are examples of similar colors. Conversely, the more *dissimilar* colors are (farther from one another on the wheel), the more exciting the combination will be. Red and green, orange and blue are examples of dissimilar colors.

Another thing to keep in mind is the color symbolism so deeply embedded in our culture. Displays, with their simplified format, can easily take advantage of this almost subliminal communication.

■ **In short**, choose colors that will best convey the feeling you are trying to inspire in your viewers. Don't introduce a controversial program in red and yellow, and don't paint the Good Ship Lollipop blue and gray. Know, too, that children prefer color contrast; adults and people with higher education levels prefer softer tones; women are more attracted to color than men; men generally prefer blue.

Guides for Display Design

■ **Keep it Simple.** Remember, you've got only about three minutes for the message to be read: Strive for a concise, unified presentation.

Use as little copy as possible — one snappy slogan will do — and avoid using more than one typeface.

Limit your colors, too. Generally, two-color schemes are easiest to control. In any event, don't use more than four colors, even on a giant panel. Unify your presentation by having one color (cool) dominate: background, secondary titles, picture mats. A second color (warm or cool) can be used for accents: the major headline, mounting for the focal photograph, etc. And, once you introduce a color, repeat it elsewhere on the surface.

■ **Beware Proportion.** Keep the display elements scaled to the size of the background — and remember, the scale is large. Don't try to fill a large area with a lot of little things.

■ **Watch the Placement.** Place the most important element and brightest color at eye level, to the right; this is the "center of interest," the spot where the eye is drawn naturally.

Realize that there is wasted space on a large display panel: the bottom third and the upper-left corner. Avoid putting pale, bright, or warm colors in either place. They will draw the eye away from the message and out of the design surface.

The Foolproof Layout

An attractive — and simple — display layout scheme can be derived from the "Mondrian style," popularly used for publications design.

Simply divide the surface into rectangles with lines of varying widths. Don't overdo it. Fill the boxes with type, visuals, or color — or leave some plain.

Nancy Morse, who has produced about 100 displays for a variety of events, is corporate coordinator of public relations for Kennedy Memorial Hospitals-University Medical Center in Stratford, N.J. As a graduate student at Glassboro State College, she collected extensive research on the self-produced display as a communication aid.

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BREA FIRE DEPARTMENT OPERATIONS MANUAL BOOK NO. 1 ORGANIZATION	CHAPTER VII	Records and Reports	
	SUBJECT - 8	Public Education Information Report	
	CODE 1-VII-8	PAGE 1 OF 3	DATE: Feb 6, 87

8.01 Purpose:

- A. To provide a means for scheduling public education programs.
- B. To provide a record of Fire Department public education activities.

8.02 Policy:

- A. A Public Education Information Report shall be completed for each program, class or demonstration requested of and/or conducted by Fire Department personnel.
- B. Completed Public Education Information Reports shall be forwarded through the regular Department mail to the Fire Prevention Division.

8.03 Objective:

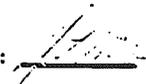
- A. To provide a policy relative to the use of the Public Education Information Report.
- B. To provide an example of a completed Public Education Information Report.

8.04 Scope:

This policy shall involve all demonstrations, classes, talks and programs which may be given to any group, club, industry, organization or school.

8.05 Responsibility:

- A. The Fire Prevention Division shall be responsible for scheduling all public education programs, demonstrations and tours with the exception of CPR and first-aid training.
- B. The Duty Battalion Chief shall be responsible for scheduling all CPR and first-aid training.
- C. It is the responsibility of those personnel who may be involved in giving demonstrations, programs, classes, etc. to properly complete the Public Education Information Report.
- D. The Fire Prevention Divisions shall be responsible for compiling and maintaining Public Education records.

APPROVED: 

BREA FIRE DEPARTMENT OPERATIONS MANUAL BOOK NO. 1 ORGANIZATION	CHAPTER VII	Records and Reports	
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8.06

Procedure:

- A. Section I of the Public Education Information Report shall be filled out at the time a public education request is received. The pink copy shall remain in the Fire Prevention Bureau and the white copy shall be sent to the appropriate Duty Battalion Chief. If the request originates from Company personnel, both copies of the Report may be retained until Section III is completed.
- B. The Duty Battalion Chief shall be responsible for placing the scheduled program on the Master Calendar and forwarding the master copy to the responsible fire company or personnel. If the requested date and time are unavailable, the contact person shall be notified to confirm a new date and time.
- C. Upon completion of the program, Section III of the Public Education Information Report shall be filled out. The completed form shall be forwarded through the regular department mail to the Fire Prevention Bureau.
- D. The Fire Prevention Bureau shall keep all completed forms for a minimum of two years and from these compile monthly and yearly statistics.

APPROVED: 

BREA FIRE DEPARTMENT
OPERATIONS MANUAL
BOOK NO. 1
ORGANIZATION

CHAPTER VII

Records and Reports

SUBJECT - 8

Public Education Information Report

CODE 1-VII-8

PAGE 3 OF 3

DATE: Feb 6, 87

BREA FIRE DEPARTMENT
PUBLIC EDUCATION INFORMATION REPORT

SECTION I

PROGRAM REQUESTED: Station Tour

LOCATION: STATION ONE

GROUP: MARIPOSA 2ND GRADE PROJECTED ATTENDANCE: 2 classes @ 30

REQUESTED DATE: FRIDAY Oct 12 TIME: 9:00am - 10:00am

ALTERNATE DATE: THURSDAY Oct 11 TIME: SAME

CONTACT PERSON: CARLY BROWN PHONE #: 529-4916

ADDRESS: MARIPOSA

SPECIAL INSTRUCTIONS: THESE ARE TWO SEPARATE TOURS,
ONE FOR EACH CLASS OF 30 STUDENTS

DATE RECEIVED: Oct 2, 1984 SIGNATURE: Anna T. Cain

SECTION II

PROGRAM CONFIRMED FOR: DATE: FRI Oct 12 TIME: 9:00am & 10:00am

PLACED ON MASTER CALENDAR BY: R. Kane DATE: Oct 5, 1984

PERSONNEL TO HANDLE: "A" shift, ENGINE 1

EQUIPMENT NEEDED: NONE

SECTION III

PROGRAM WAS

- Completed
 Cancelled - Why? _____

HOURS: 2 ATTENDANCE: 64

PERSONNEL INVOLVED: LEHMAN, CRUITT, LONG

COMMENTS: GOOD GROUP DISTRIBUTED PLASTIC
FIRE HEADERS

SIGNATURE: Jack Lehman DATE: Oct. 12, 1984

APPROVED: [Signature]



BREA FIRE DEPARTMENT
PUBLIC EDUCATION INFORMATION REPORT

SECTION I

PROGRAM REQUESTED: _____

LOCATION: _____

GROUP: _____ PROJECTED ATTENDANCE: _____

REQUESTED DATE: _____ TIME: _____

ALTERNATE DATE: _____ TIME: _____

CONTACT PERSON: _____ PHONE #: _____

ADDRESS: _____

SPECIAL INSTRUCTIONS: _____

DATE RECEIVED: _____ SIGNATURE: _____

SECTION II

PROGRAM CONFIRMED FOR: _____ DATE: _____ TIME: _____

PLACED ON MASTER CALENDAR BY: _____ DATE: _____

PERSONNEL TO HANDLE: _____

EQUIPMENT NEEDED: _____

SECTION III

PROGRAM WAS Completed
 Cancelled - Why? _____

HOURS: _____ ATTENDANCE: _____

PERSONNEL INVOLVED: _____

COMMENTS: _____

SIGNATURE: _____ DATE: _____



