

---

**Final Evaluation Report**  
**NTIA Grant Number 29-60-98008**

---

**Submitted to:**  
**Boone County Fire Protection District**  
**2201 I-70 Drive Northwest**  
**Columbia, Missouri 65202**  
**573-447-5000**  
**FAX: 573-447-5099**

**Submitted by:**  
**Eliodora Chamberlain, M.S.**  
**2401B Chapel Hill Rd.**  
**Columbia, Missouri 65203**  
**573-446-8025**  
**Email: [ejc764@mizzou.edu](mailto:ejc764@mizzou.edu)**

**May 31, 2004**

## TABLE OF CONTENTS

	Page
1. EXECUTIVE SUMMARY.....	1
2. INTRODUCTION.....	3
3. PROJECT #1	
A. Background.....	5
B. Objective.....	6
C. Solution.....	6
D. Results.....	10
E. Conclusions.....	19
4. PROJECT #2	
A. Background.....	21
B. Objective.....	22
C. Solution.....	22
D. Results.....	23
E. Conclusions.....	25
5. PROJECT #3	
A. Background.....	26
B. Objective.....	28
C. Solution.....	28
D. Results.....	29
E. Conclusions.....	33
6. APPENDICES	
A. Appendix A: Map of Boone County	
B. Appendix B: BCFPD Fire Station Network	
C. Appendix C: BCFPD Wide Area Network	
D. Appendix D: Training/Simulation Lab at Midway Elementary	
E. Appendix E: Vehicle Fire Training Simulation	
F. Appendix F: Survival Kids Curriculum	

**TABLES**

	Page
Table 1.....	9
Table 2.....	11
Table 3.....	12
Table 4.....	13
Table 5.....	15
Table 6.....	17
Table 7.....	18
Table 8.....	25
Table 9.....	31
Table 10.....	31
Table 11.....	32
Table 12.....	33

**FIGURES**

	Page
Figure 1.....	13
Figure 2.....	19
Figure 3.....	24

## EXECUTIVE SUMMARY:

The purpose of this evaluation is to examine three project objectives set forth by the Boone County Fire Protection District, Columbia, Missouri: 1) to improve communications between fire personnel (officers and firefighters) and administration, 2) to enhance computer and web-based training opportunities for firefighters, and 3) to improve access and increase utilization of the Survival Kids curriculum.

The Boone County Fire Protection District successfully completed all necessary computer installations, internet connections, and computer training for over 200 Fire District members. Each individual was given a user ID, password, email address, and internet access. As a result, all volunteer firefighters and officers frequently use their Fire District email accounts. Over 96% of the Fire District personnel felt that the Fire District's email system helped them receive Fire District updates, changes, and announcements faster than the previous FAX system. And 94% of the members felt that communication between the Fire District administrators and personnel has improved with the email system.

To date, 162 volunteer firefighters have completed the necessary computer training to successfully continue with their online training scenarios. Currently, there is one online training scenario (Vehicle Fires) available to the firefighters. Twenty-three firefighters have completed the online Vehicle Fire training, and all have successfully passed the written tests while 96% have passed their exercise test.

The Survival Kids curriculum has successfully placed all 8 survival lesson tests online for the students to complete. To date, 411 students have completed the Survival Kids program with an average score of 99% compared to that of 74% in the Pre-Tests.

## INTRODUCTION:

The Boone County Fire Protection District began under the auspices of The Central Missouri Radio Squad Volunteer Fire Department in 1964 with 30 volunteers from the Central Missouri Radio Squad. In 1970, when the Missouri state law made amendments to allow the formation of fire protection districts more feasible, the volunteer firefighters of the Central Missouri Radio Squad campaigned for the formation of the first out-state fire protection district (outside the St. Louis and Kansas City area). As a result, the Boone County Fire Protection District (BCFPD) was created on July 11, 1970.

During the late 1970's, the Boone County Fire Protection District added several fire stations in several areas to match the growth of Boone County. The Boone County Fire Protection District also began its Emergency Medical Services First Responder Program in 1977. It was one of the first programs created in the country, and now accounts for approximately 60% of all emergency responses within the Fire District. In the 1980's, additional developmental core programs such as public education, training and facility/equipment maintenance further enhanced the Fire District.

The Boone County Fire Protection District continued to grow in the 1990's with the development of several specialty teams. In the mid-1990's, the Fire District received federal funds for the formation of a Federal Urban Search and Rescue Task Force, Missouri Task Force 1. This task force significantly increased the rescue capabilities of the organization across all geographic scales-locally, statewide and nationally.

Currently, the Boone County Fire Protection District is one of the largest volunteer fire department in the United States with 14 fire stations. It has expanded from the initial 30 volunteer firefighters to over 300 volunteers, protects 532 square miles of residential, commercial, industrial and agricultural property, and serves over 45,000 families (Appendix A). The volunteer personnel provide almost 90,000 hours of service each year. The Fire District responds to over 3,000 emergency service calls each year. There are three primary types of calls: emergency medical responses (67%), fire calls (10%), and service calls (5%).

Boone County is a growing developmental region of Missouri, and the Boone County Fire Protection District has evolved and adapted to the area's rapidly growing demands to the best of its ability. As technology and communities progress, so must the services of the Boone County Fire Protection District. In 1998, the Fire District identified three problems in the communication system, training, and public education. The first problem identified was the inadequacy of communication between the volunteer firefighters and officers. The second problem involved the education and training of the Fire District's rapidly growing volunteer department. The third problem involved expanding the current Survival Kids curriculum from the nearby cities in Boone County to reach children globally.

**PROJECT #1:**

**Background:**

In order to meet the needs of a growing community, the evolution of the Boone County Fire Protection District's communications department must parallel that of today's technology. The Fire District is a large and complex organization encompassing over 300 volunteers, 39 officers, and at least five specialty teams. Before receiving the grant from TIIAP in 1998, the 225 volunteer firefighters and officers communicated with each other using several time consuming methods such as newsletters, fax machines and telephone calls.

There were two types of communication methods utilized by the Fire District's volunteers. Interaction occurred through the utilization of restricted emergency 911 communication system and a non-emergency administrative communication system. Non-emergency communication existed through the use of monthly newsletters and faxing daily operational bulletins to each of the fire stations. In order for the volunteers to receive routine information regarding road closings, railway warnings, weather alerts, training announcements, public information events, curriculum changes and scheduling updates, routine telephone calls and monthly newsletters were made to each individual.

Not only was communication between volunteer firefighters time consuming and ineffective, but Fire District officers struggled to complete incident reports. At the conclusion of each fire and EMS incidents, officers were responsible for completing incident reports and managing all the administrative paperwork for their fire stations. In order to complete these duties, officers had to

travel to a nearby Fire District station and fax the reports and paperwork to the Boone County Fire District Headquarters. Once District Headquarters received the paperwork, the secretarial personnel manually entered each report into a software program. This proved to be an ineffective and time consuming process.

**Objective:**

The overall objective was to improve communication between fire volunteers (firefighters and officers) and Boone County Fire Protection District administrative staff.

**Solution:**

The solution to the aforementioned problems was to create a Wide-Area Network (WAN) utilizing computer workstations and laptops with direct internet access at each Fire District station (Appendix B). Twelve workstations were installed in each Fire District station with direct Internet access, and connected to an existing server at the Fire District Headquarters. Each remote fire station was fitted with a small Ethernet LAN connected to the Ethernet interface on its own router (Appendix C). Internet traffic is also routed through a Cisco 3640 router at the District Headquarters (Appendix C). Each of the outlying fire stations were connected to a frame-relay cloud via 56K circuits. At the District Headquarters, several workstations were connected into the cloud with a T1 circuit to support incoming traffic from remote stations. In order to provide better throughput, a frame-relay protocol was used as the WAN technology over point-to-point serial connections, especially for email and web access.

In order to complete their incident reports, each station officer received a laptop computer that can be connected directly to the Fire District Headquarters through a standard dial-up connection (Appendix B). This allowed them to directly access the incident report software on the Internet and complete their report.

Additionally, a Local Area Network (LAN) was developed for a computer training center at Midway Elementary School (Appendix D). The computer training facility at Midway Elementary School was equipped with 40 computers and a local Web server. Boone County Fire District volunteer firefighters were trained in general telecommunications and taught how to access vast information resources. The training facility also provides a sufficient bandwidth to execute sophisticated web-based simulation software. The facility was used to train the firefighters and officers on the how to use the email system, Microsoft Office, and the National Fire Incident Reporting System (NFIRS). NFIRS is the software used to complete the incident reports.

Email accounts were given to each Fire District officer and volunteer firefighter, and each member had access to their accounts using the computers provided at each Fire District station. Each month a mass email message was sent to all the volunteer firefighters and officers requesting a return message of being read. This measured how many volunteer firefighters and officers were utilizing their email addresses. It was also used to measure how long it would take for a response. The number of responses was measured for 7 or more days from the time of initial receipt. Both Fire District officers and volunteer firefighters

**PROJECT #2:**

**Background:**

The Boone County Fire Protection District is the largest volunteer fire district in the state of Missouri. In order to recruit and retain excellent firefighters, the organization must provide opportunities to improve the firefighters' skills and expand their knowledge and expertise. The Boone County Fire Protection District is built on the services of the volunteers. Volunteer firefighters are needed to protect and to serve the more than 45,000 residents in the service area. They are needed to respond to a variety of incidents including fires, emergency medical incidences, automobile accidents, farm accidents, cave rescues, confined space rescues, trench rescues and various water rescues. As a result, the firefighters must be trained for a wide array of incidents other than fighting fires.

Although training demands are more intense due to the increasing responsibilities and challenges, training is still vital to the function of the organization. To Boone County Fire Protection District training and education is vital, especially for an organization that heavily relies on volunteers for its effectiveness. Increasing the Fire District personnel's computer skills enabled them to further their fire and rescue education by providing more opportunities to take computer training programs from the National Fire Academy Incident Command and Control Simulation Series, and to register for online courses such as Introduction to Terrorism and Weapons of Mass Destruction. Additionally, electronic training simulations developed by this project can help train more than

30 new recruits each year, update the skills of current volunteers, and enhance the skills of more than 8 specialty teams within the Boone County Fire Protection District.

**Objective:**

The overall objective was to provide enhanced computer and web-based training opportunities for all members of the Boone County Fire Protection District.

**Solution:**

A Local Area Network (LAN) was developed for the computer facility at Midway Elementary School (Appendix D). The computer training facility at Midway Elementary School was equipped with 40 computers. Several courses were offered to Fire District personnel and taught at the Midway Elementary School Media Center. The three courses taught at the Midway Elementary School Media Center were: 1) a 3-hour class on Introduction to Windows, Internet Browsing, and Group-wise web access and utilization, 2) a 3-hour class on Microsoft Office Suite, and 3) a 3-hour class on National Fire Incident Reporting System (NFIRS).

The Local Area Network was switched to 10BaseT ports with the server attached to a switched 100BaseT uplink port. This design prevents the training facility equipment from competing for the same shared network as the rest of the school's devices. It also provided enough bandwidth for the clients to run sophisticated web-based simulation software (Appendix D).

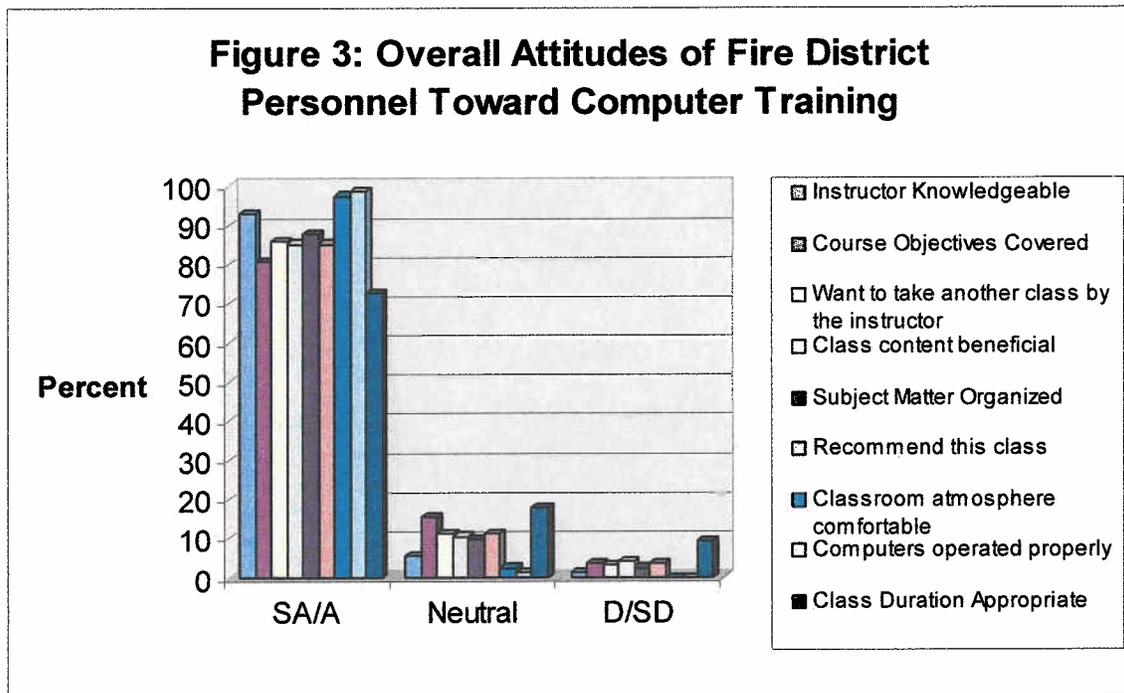
LANIT developed the Vehicle Fire training simulation (Appendix E).

Training simulation includes an introduction followed by a set of objectives for the training simulation. The next section of the simulation involves the Response with links to each type of incident, a dispatch dialog, and teaches the appropriate response tactics. The following component in the module, the Arrival, provides information pertaining to the events as the firefighter approaches the scene. After the arrival at an incident, the firefighter must then learn to Manage the Scene. Steps include size-up, strategic goals, standard incident priorities, tactical objectives, developing an incident action plan, implementing the action plan, developing an incident organization chart, establishing incident zones, and announcing tactical benchmarks. After the firefighter concludes the Scene Management lesson, they continue with Safety Issues. This section involves developing a risk management plan and identifying scene hazards. The remaining portions of each training simulation are Demobilization and Managing the Incident, which includes a practical scenario and the completion of several worksheets. Each firefighter took a written Pre-Test and a Pre-Test exercise. The Pre-Test exercise involved drawing a diagram of an incident. At the end of each training simulation, a written Post-Test and a Post-Test exercise was given to each volunteer firefighter. Pre- and Post-Test scores (both written and exercise) measure the effectiveness of the training web sites.

**Results:**

After the computer training sessions were completed, 162 volunteer firefighters rated the effectiveness of the training. Participants were asked to rate

the program they attended on 9 items on a five-point Likert scale: *strongly agree*, *agree*, *neutral*, *disagree*, and *strongly disagree*. Most of the attendees agreed that the instructor was knowledgeable (93.21%), the course objectives were covered by the instructor (80.86%), and they would take another class by that instructor (85.8%) (Figure 3). Most of the participants agreed that the course content was beneficial to learning (85.19%), subject matter was organized (87.65%), and they would recommend this class to someone else (85.18%) (Figure 3).



At this time, LANIT, has completed one of the training simulations, the Vehicle Fire training simulation. Three more training simulations are scheduled for completion in June 2004. The following results are based on the Vehicle Fire Pre- and Post-tests (written and exercises) only. A total of 23 firefighters completed the Vehicle Fire training (Table 8). The average written Pre-Test

score was 82%, and 57% of the firefighters passed the Pre-Test exercise (Table 8). After completing the Vehicle Fire training, the average written Post-Test score was 100%, and 96% of the firefighters passed their Post-Test exercise (Table 8).

Table 8: Test score results from the Vehicle Fire training simulation.

	Number of Students	Written Pre-Test Score	Written Post-Test Score	Pre-Test Exercise	Post-Test Exercise
Vehicle Fires	23	82%	100%	57% Passed	96% Passed

### Conclusions:

The computer training was successfully completed by 162 volunteer firefighters. More than 85% of the attendees felt that the computer class was beneficial. The Vehicle Fire training simulation was successfully completed by 23 firefighters, and at completion all had an average written score of 100% compared to a written Pre-Test score of 82%. Out of 23 firefighters, 22 successfully passed the Post-Test exercise, compared to 13 who passed on the Pre-Test exercise. In conclusion, the online Vehicle Fire training simulation was effective with 96% of the firefighters successfully passing their Vehicle Fire exercise.

Results from computer training provided more opportunities for Fire District personnel to take online courses such as Basic Incident Command System (ICS), Introduction to Terrorism, Weapons of Mass Destruction, Basic Firefighting, Rescue and Emergency Medical Services. By increasing the Fire District personnel's use and confidence in computer skills, they were able to take several CD-ROM training programs such as the Tutorial Wildland Series and the National Fire Academy's Incident and Control Simulation Series.

**PROJECT #3:**

**Background:**

Survival Kids is an elementary public education program designed to teach life saving skills that go beyond fire safety. The majority of the calls that fire departments respond to mostly require emergency medical services with only 10% of the calls are relating to fire. The reality being-fire departments are responding to more than just fires. The Survival Kids program was built on this fact. Fire departments equipped with emergency medical services respond to auto accidents, shootings, drownings, bike accidents, burns and more.

The Survival Kids program is designed to teach students about life safety and survival skills. Boone County Fire Protection District wanted to create a program that addressed the needs of the citizens. In 1993, an education program that addressed safety and survival did not exist in the schools. So in 1994, an interactive, education program was created. There are several aspects to this program that differentiates it from all the rest. Survival Kids is taught by the volunteer firefighters on a monthly basis to each 4<sup>th</sup> grade class in 11 elementary schools throughout Boone County, Missouri. The 7 volunteer firefighters visit 30 classrooms each month throughout the school year with a new lesson each month. It is believed that the strength of the curriculum comes from having actual firefighters teach each of the lessons. They are actively involved in the creation and presentation of the curriculum. Not only do the firefighters instruct the students in the classroom, but they also play with the

students on the playground during recess, each lunch and/or read to the children during story hour.

In addition to the instructors being volunteer firefighters, the program does not rely on the classroom teachers to present the information, and the Fire District covers the cost of all lesson materials, handouts and related supplies. The school supplies the children, the classroom, and the time.

The volunteer firefighters return each month to the same kids throughout the year. Each lesson includes a teaching outline, student activities, videotapes, and audio-visual support (Appendix F). The lessons last one class period, and the children are given activities to complete in class, as well as handouts for their parents and family. The safety and survival lessons are based on the types of incidents that the Fire District experiences involving children. In October, the children are taught lessons in Fire Behavior-Cause and Effect. They are taught how to escape in an emergency through the Harry Houdini Escape Planning in November. During the month of December, the volunteer firefighters address Personal Safety-Strangers and What to do. During the following winter months, the lessons move to subjects like Calling for Help (January), Burn Prevention (February), and Firearm Safety (March). As spring approaches, they are taught about Bicycle Safety (April) and Water Safety (May). In April, the Boone County Fire Protection District takes the Fire Safety House that contains 2 small bedrooms. In this trailer, the firefighter instructors simulate actual smoke conditions, and teach the children how to escape from a home properly. Each of these issues are addressed during a time when accidents relating to those

incidents are high. And each of these lessons include English, history, math or science as their foundation.

The Survival Kids curriculum was established by viewing several commercially based education programs and building upon them to meet the community's needs. The 4<sup>th</sup> grade class was chosen as the target audience because it was the best age to begin teaching children more detailed lessons. By providing it to the 4<sup>th</sup> grade classes also gave the children a chance to build a relationship with the firefighters, then formulating a relationship with the police officers in the following year with the DARE program (a law enforcement drug education program).

Since its inception in 1994, more than 5000 students from the 3<sup>rd</sup> and 4<sup>th</sup> grades have graduated from the Survival Kids program. It is hope of the Boone County Fire Protection District that more kids will go through the Survival Kids program and teach them skills to survive any physical dangers they may face. Providing the Survival Kids curriculum online, will allow more children to learn the skills necessary to prevent common accidents.

**Objective:**

The overall objective was to improve access and increase utilization of the Survival Kids program by making it available through the web.

**Solution:**

LANIT converted the Boone County Fire Protection District Survival Kids curriculum to an interactive, web-based product that is widely available through the Internet (Appendix F). The Survival Kids curriculum is based on 8 lessons:

Fire Behavior-Cause and Effect, Harry Houdini Escape Planning, Personal Safety-Strangers and What To Do, Calling for Help, Burn Prevention, Firearm Safety, Bicycle Safety, and Water Safety. With each test the student passes, they are promoted in rank beginning with the Firefighter up to Fire Chief (Appendix F).

Each student is required to register with their name, school, grade, password, city, state, and teacher's name. The information provided by the students gives us the number of registrations, and student demographics. A random sample of ten questions from the 8 Survival Kids lessons were given to each of the students before teaching the Survival Kids curriculum (Pre-test) and after teaching the Survival Kids curriculum (Post-test). A Pre- and Post-Test was given to the students to measure the effectiveness of the 8 Survival Kids lessons.

Once the student passed each test, they were then given an option to move to the next lesson, print their badge, or return at a later date. Ideally, each student should complete the appropriate test with the lesson they were taught that month.

### **Results:**

WebTrends collected all the web site data for the Boone County Fire Protection District web site ([www.bcfldmo.com](http://www.bcfldmo.com)) in the year 2003. For the purposes of this project, I will only discuss web trends relating to the Survival Kids web site ([www.bcfldmo.com/survival\\_kids](http://www.bcfldmo.com/survival_kids)) through the year 2003.

In 2003, the Survival Kids website was viewed 1,673 times, visited 1,361 times, and the average time viewed was 4 minutes and 23 seconds. Average

time viewed is defined as the average length of time the specified page was viewed. Views are defined as the number of times the specified page was viewed by a visitor. Each page can be viewed more than once by the same visitor, and each view is counted. Visits are defined as the number of visits that include a view of the specified page. Individual visitors are counted each time they come to the web site, and are counted only once per visit no matter how many pages they look at. If a visitor is idle longer than the idle-time limit, WebTrends assumes the visit was voluntarily terminated. If the visitor continues to browse your site after they reach the idle-time limit, a new visit is counted.

The number of top entry pages for the Survival Kids web page is 356 visits, and accounts for 0.62% of the total top entry pages visited. WebTrends defines entry pages as the first page a visitor sees when entering the web site. To qualify as an entry page the visit must start with a valid page type.

To date (June 2004), the total number of students completing the Survival Kids curriculum was 627 (Table 9). There were 16 3<sup>rd</sup> graders, 586 4<sup>th</sup> graders, and 25 counted as other/unknown (Table 9). Most of the students (282) lived in Columbia, Missouri, while 168 students lived in Sturgeon, Missouri (Table10). One hundred and 58 students lived in the cities of Centralia, Hallsville, and Harrisburg, Missouri (Table10). There were 14 students who lived outside Boone County, and 5 students lived outside of Missouri (Table 10).

Table 9: Number of students per school grade who took the Survival Kids online test.

<b>Grade</b>	<b>Number of Students</b>
3rd Grade	16
4th Grade	586
Other/Unknown	25
<b>Total</b>	<b>627</b>

Table 10: Number of students per city in Boone County, outside of Boone County, and outside the state of Missouri.

<b>City</b>	<b>Number of Students</b>
Centralia	9
Columbia	282
Hallsville	89
Harrisburg	60
Sturgeon	168
Out of County	14
Out of State	5
<b>Total</b>	<b>627</b>

More specifically, 9 students attended schools in Centralia, 91 attended Hallsville Elementary, 62 attended Harrisburg Elementary, and 168 students attended Sturgeon Elementary (Table 11). The students living in Columbia attended 6 elementary schools: Cedar Ridge Elementary (49 students), Field Elementary (64 students), Midway Heights (36 students), New Haven Elementary (33 students), Rockbridge Elementary (51 students), and Two Mile Prairie Elementary (34 students) (Table 11).

Table 11: Number of students represented by Boone County Schools, outside of Boone County, and other.

School	Number of Students
Centralia	9
Columbia-Cedar Ridge	49
Columbia-Field Elementary	64
Columbia-Midway Heights	36
Columbia-New Haven Elementary	33
Columbia-Rockbridge Elementary	51
Columbia-Two Mile Prairie Elementary	34
Hallsville	91
Harrisburg	62
Sturgeon	168
Other	11
Out of County	19
<b>Total</b>	<b>627</b>

In the Pre-Test scores, only 3.06% of the students got all 10 questions correct (Table 12). Most students (35.25%) scored a pre-test score of 8 out of 10, while approximately 26.3% scored 70% (7 out of 10 correct) on the Pre-Test (Table 12). After the students were taught the lessons, 94% of the students correctly answered 10 out of 10 questions, with 4.3% scoring a 9 out 10, 0.96% scoring an 8 out of 10, and 0.32% scoring a 7 out of 10 (Table 12). No student scored below 70% (7 out 10 correct) (Table 12). The average grade before the Survival Kids lessons were taught was 74.29% (Table 12). Test scores significantly increased to 99.28% after the students were taught the lessons (Table 12).

Table 12: The Pre-and Post-Test score results from 411 students. Numbers represent the number of students who received that score.

Percent Correct	Pre-Test	Post-Test
10%	0	0
20%	1	0
30%	5	0
40%	16	0
50%	43	0
60%	61	0
70%	165	2
80%	221	6
90%	77	27
100%	38	592
<b>Average</b>	74.29%	99.28%
<b>Total Number of Students</b>	627	627

**Conclusions:**

Putting the Survival Kids lesson tests on the Boone County Fire Protection District website, has allowed more students to take the tests, thereby allowing them to progress to the next level faster. The high percentage of students making a score of 70% or higher demonstrates a high percentage of improvement if the students are taught the lessons. The average test score increased from 74% to 99% after the students completed the Survival Kids curriculum.

However, at this time, there is a low number of students ( $\leq 19$  students) taking the Survival Kids curriculum living outside of Boone County and Missouri. The Survival Kids web pages currently do not have the lessons online for interested students outside of Boone County or the state of Missouri. As a result, the addition of the Survival Kids web pages on the Boone County Fire District site, cannot impact a large number of students as previously expected. Students attending the local schools have access to the lessons are personally taught

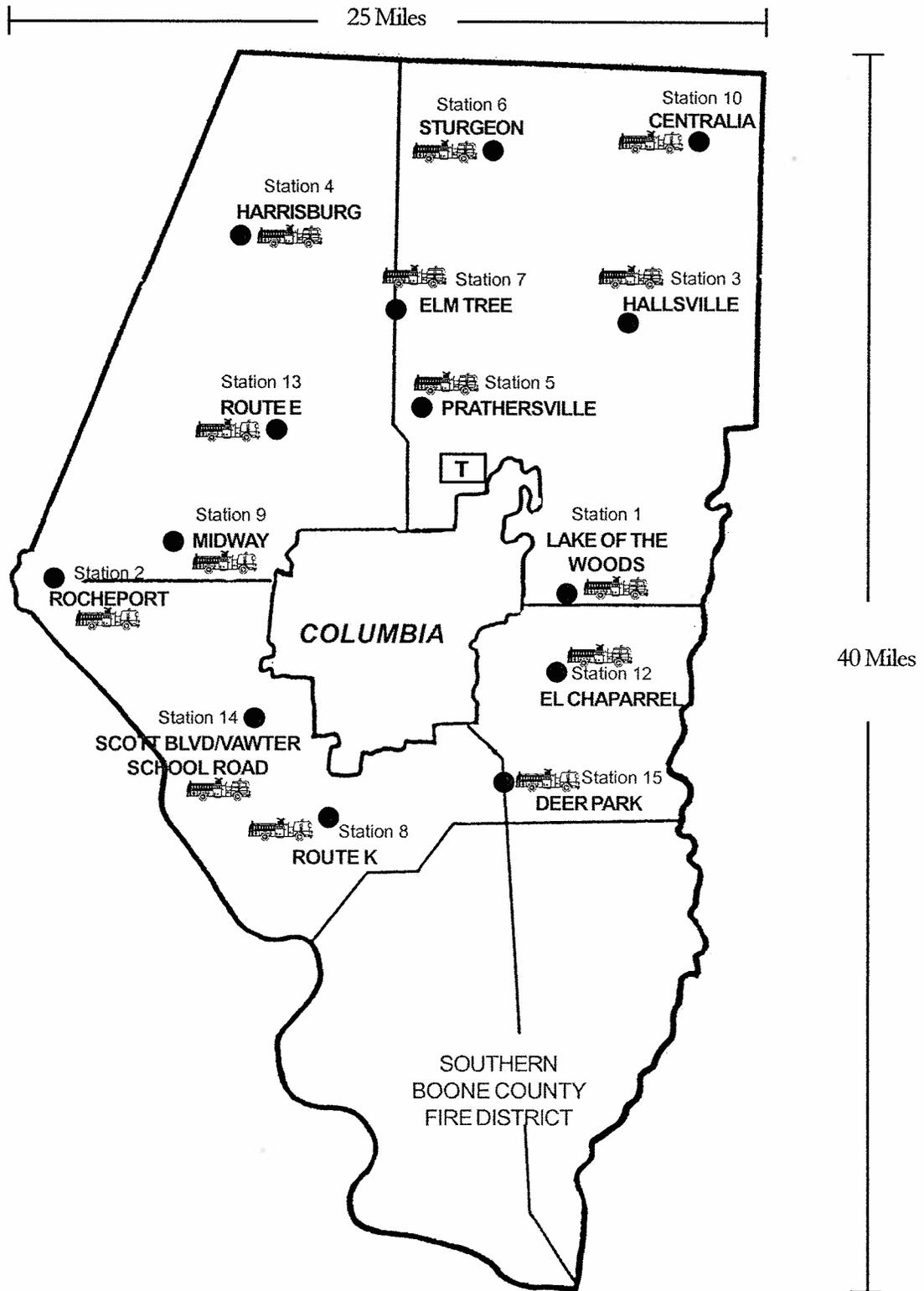
each lesson by a local volunteer firefighter. Students living outside Boone County or the state of Missouri do not have that luxury.

Although, the percent improvement made by the students after each lesson is great (94% with a score of 10), the number of times the web pages are viewed (1,673) has not reached its full potential. There are a couple of suggestions to improve the number of hits on the Survival Kids web pages. First, give the Survival Kids web page its own web site with a link to the Boone County Fire Protection District. Currently, the Survival Kids web page is linked to the BCFPD web site. Second, the each of the 8 Survival Kids lessons should be placed online along with each test. Currently, each local student receives the lesson during class each month. However, students living outside of Boone County or Missouri, do not have access to that information. If the lessons are placed online along with each test, then the students will gain the information needed to survive and prevent common accidents.

# APPENDIX A

---

# Boone County Fire Protection District Fire Station Locations



Boone County Fire District is approximately 25 x 23 miles minus 50 sq miles for the City of Columbia.

# APPENDIX B

**BCFPD  
Wide Area Network  
(Frame Relay)**



**StationRouter**



**StationHub**



**StationComputer**

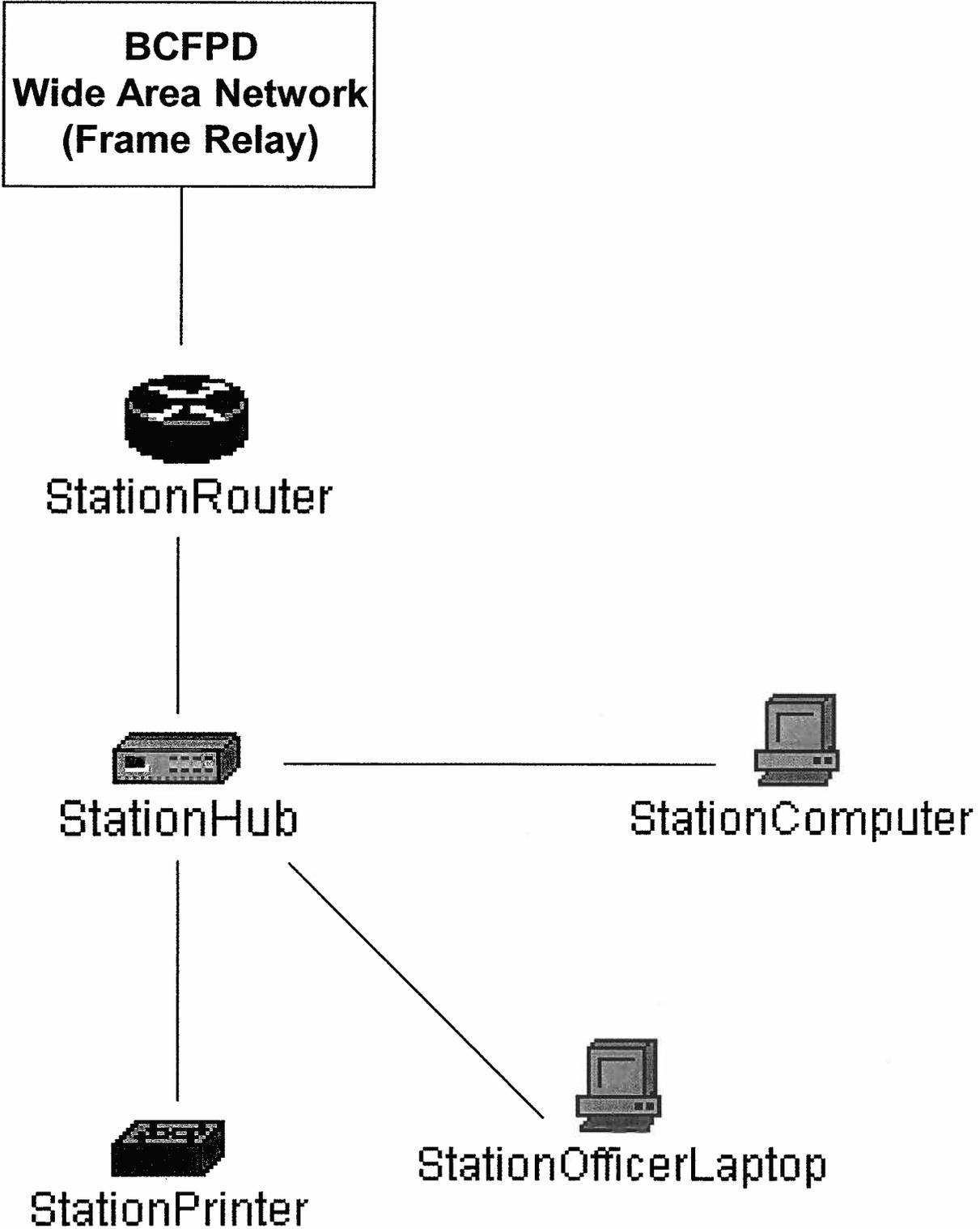


**StationPrinter**



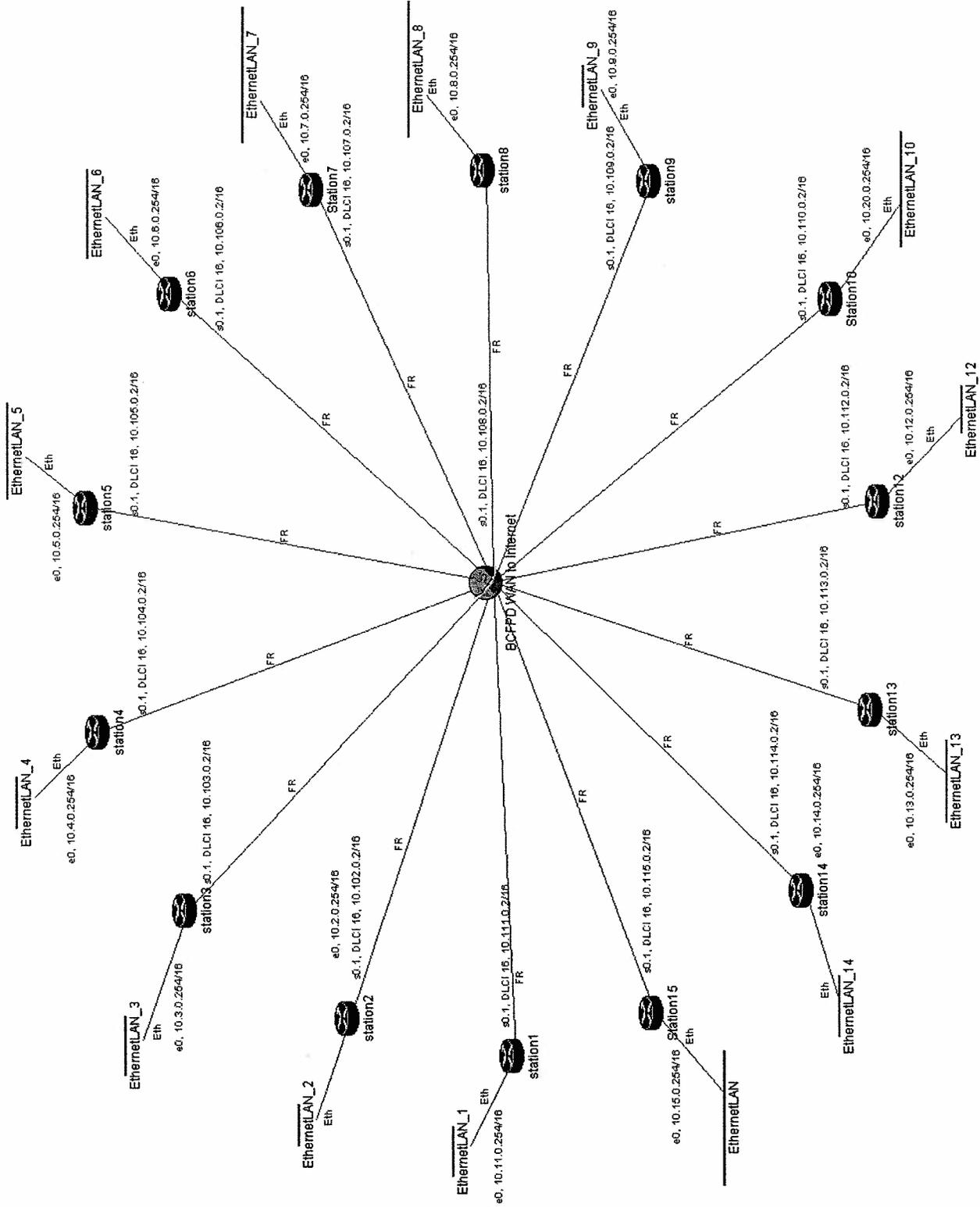
**StationOfficerLaptop**

## **BCFPD Fire Station Network**



## APPENDIX C

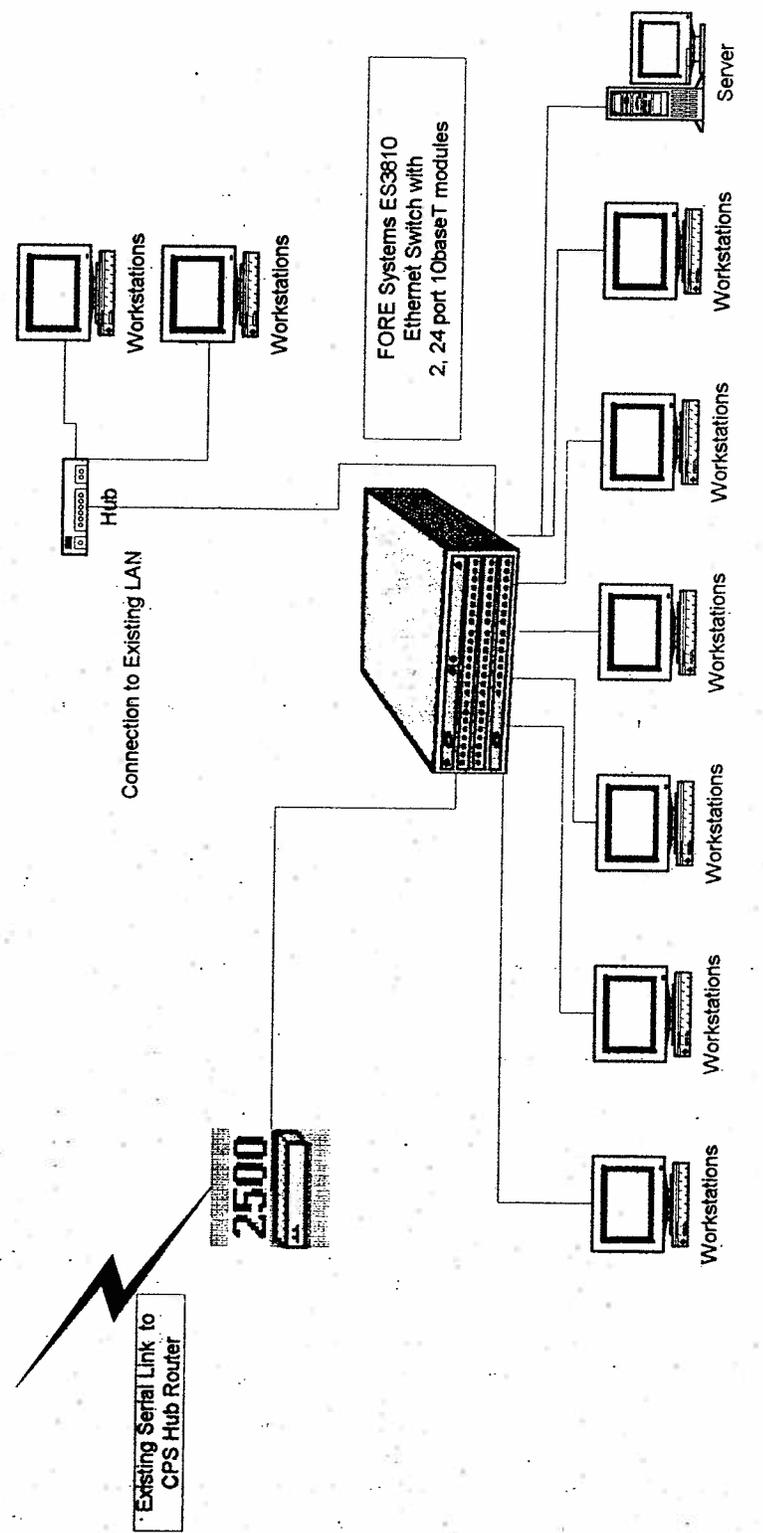
# Boone County Fire Protection District



# Wide Area Network

# APPENDIX D

# Training / Simulation Lab at Midway Elementary



# APPENDIX E

## Managing Vehicle Fires

### Table of Contents

### Introduction

The management of a vehicle fire incident can present unique challenges to the fire service incident commander. Vehicle fires can occur anywhere and at anytime. The primary goal of this lesson is to provide you, the fire officer, with information that will help you manage a vehicle fire incident.

Take the Pretest



© 2004 Boone County Fire Protection District

**Note:** This site would look much better in a browser that supports web standards, but it is accessible to any browser or Internet device.

**Introduction**

The management of a vehicle fire incident can present unique challenges to the fire service incident commander. Vehicle fires can occur anywhere and at anytime. The primary goal of this lesson is to provide you, the fire officer, with information that will help you manage a vehicle fire incident.

Take the Pre-Test



**Figure 1**

---

**Mouse-Over Dialog Boxes**

Take the Pre-Test {Vehicle Fire Pre-Test.pdf}

## Objectives

At the completion of this module you should be able to:

1. Demonstrate a basic knowledge of scene size-up for vehicle fire incident.
2. Demonstrate a basic knowledge of apparatus and personal vehicle placement at a vehicle fire incident.
3. Demonstrate the use of standard incident management system principles to manage a vehicle fire incident.
4. Demonstrate a basic knowledge of the scene safety requirements and considerations at a vehicle fire incident.
5. Demonstrate a basic knowledge of basic fire attack principles for a vehicle fire.
6. Demonstrate a basic knowledge of the special considerations for a fire involving a motor vehicle.



**Figure 2**

## Response

There are two types of vehicle fire incident responses:

- Vehicle Fire Under One Ton (CAD Code VF)
- Vehicle Fire Over One Ton (CAD Code VFT)

### Listen to a Vehicle Fire Dispatch

After hearing the dispatch start the Command Sequence

- Additional resources needed?
- Location hazards, difficulties with access and control?
- Exposures?
- How did this fire start? Vehicle accident? Arson? Meth Lab?

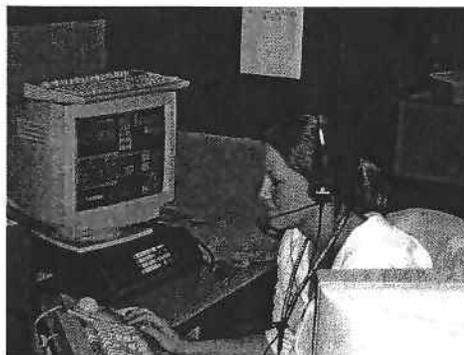


Figure 3

Review the Personal Vehicle Response Tactic and the Apparatus Response Tactic.

---

## Mouse-Over Dialog Boxes

Vehicle Fire Under One Ton (CAD Code VF) Vehicle fire in a passenger vehicle or pick-up truck. One engine is assigned to this type of incident

Vehicle Fire Over One Ton (CAD Code VFT) Vehicle fire in a large vehicle, such as a tractor-trailer, dump truck, farm implement, etc. One engine and one tanker are assigned to this type of incident

Listen to a Vehicle Fire Dispatch {VFDIsapatch1 Audio.wav}

Command Sequence THINK-PLAN-ACT

Personal Vehicle Response Tactic {Personal Vehicle Response and Arrival.pdf }

Apparatus Response Tactic {Apparatus Response and Arrival.pdf}

## Overview of Scene Management

- Assume Command
- Command Sequence: THINK – PLAN – ACT
- Quickly identify the problem (Size-up)
- Problem identification leads to the development of broad Strategic Goals based on the Standard Incident Priorities
- Develop Tactical Objectives to achieve these goals.
- From these goals and objectives create an Action Plan.
- Implement the Action Plan



Figure 4

---

## Mouse-Over Dialog Boxes

Size-up An on-going process of gathering and analyzing information critical to incident factors that lead to problem identification.

Strategic Goals Broad goals that constitute an overall plan to control the operation.

Tactical Objectives Specific, measurable objectives that are necessary for the achievement of strategic goals. Standard tactical objectives include:

- Rescue
- Exposures
- Confinement
- Extinguishment
- Overhaul
- Ventilation
- Salvage

## Standard Incident Priorities

- Life Safety – Rescue of those savable victims and keeping firefighters from harm.
- Incident Stabilization – Stopping the forward progress of the fire.
- Property / Environmental Conservation – Loss control efforts aimed at preventing further damage to property, people or the environment.
- Customer Stabilization – The short and medium range needs of the customer have been addressed.

## Arrival

- As you approach the scene look at the entire scene – “The Big Picture”.
- Look at terrain/topography, weather conditions, smoke conditions, traffic, hazards such as fuels, fluids, low hanging or downed power lines.
- Look for indicators of cargo type, i.e., placards.
- Parking/Positioning of apparatus and personal vehicles is extremely important. Whenever possible, park on the same side of the road as the incident. Park uphill and upwind if possible. Keep all apparatus and personal vehicles at least 100 feet from the vehicle that is burning.
- Don’t drive through smoke!
- Position apparatus to protect personnel operating at the scene.
- Maintain ingress and egress capability.
- Consider turning off headlights if they are going to blind on-coming traffic.



Figure 5

## Size-up

Perform a Size-up and give a verbal report on the radio.

The report should include:

- Name of unit that is on the scene
- Establishment of command using a command identifier – usually the name of the street (mile markers for interstates).
- The location of the incident if different from the original dispatch.
- Short description of what you see – the number and type of vehicle(s) involved, the degree of fire involvement (if any), the description of exposures (if any), the status of traffic flow.
- Declare strategy, if applicable.
- Declare level two staging area, if applicable.
- Request additional resources, if necessary.



Figure 6

Continue to actively “size-up” the incident scene.

---

## Mouse-Over Dialog Boxes

Size-up An on-going process of gathering and analyzing information critical to incident factors that lead to problem identification.

## Develop An Incident Action Plan (IAP)

Assume Command. Establish an Incident Command Post and announce its location. Wear your Command Vest.

Your Size-Up leads to problem identification. From your mental or written list of problems you develop Strategic Goals for the incident. From these goals you develop Tactical Objectives. From these Goals and Objectives develop an Incident Action Plan.



Figure 7

---

### Mouse-Over Dialog Boxes

Incident Command Post Command and control point located at a safe distance upwind from an incident scene, where the incident commander, command and general staff, and technical representatives make response decisions, deploy manpower and equipment, maintain liaisons and handle communications. All on-scene personnel shall be notified immediately of the location and proper entry routes.

Size-up An on-going process of gathering and analyzing information critical to incident factors that lead to problem identification.

Strategic Goals Broad goals that constitute an overall plan to control the operation.

Tactical Objectives Specific, measurable objectives that are necessary for the achievement of strategic goals. Standard tactical objectives include:

- Rescue
- Exposures
- Confinement
- Extinguishment
- Overhaul
- Ventilation
- Salvage

Incident Action Plan Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

### **Implementing The Action Plan**

Check for occupants.

Use the right size/length hoseline (min. 1-1/2 inch)

Use Class A foam.

Consider exposure protection.

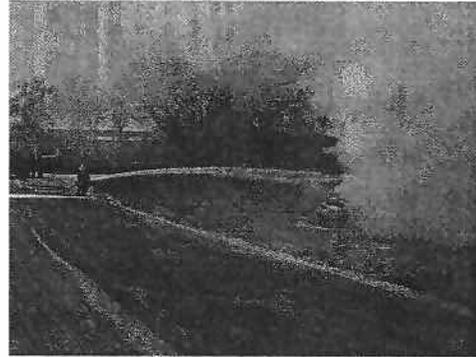
Crew leader attacks from a distance with a straight stream to get a quick knockdown, while the crew is getting ready.

The attack crew deploys with full PPE and SCBA.

Attack the fire using the proper attack sequence.

Consider deploying a backup hoseline.

Secure the vehicle with wheel chocks as soon as practically possible.



**Figure 8**

View the Vehicle Fire Tactic and Vehicle Fire Slide Sequence

---

### **Mouse-Over Dialog Boxes**

#### Attack Sequence

1. Approach the vehicle at a 45-degree angle from the front or rear.
2. Using a narrow fog pattern, cool vehicle undercarriage, including the fuel tank, drive shaft, automatic transmission, catalytic converter and any affected energy-absorbing bumper system.
3. Cool the tires, wheels, suspension system
3. Cool engine compartment. Keep hood low to reduce oxygen supply to fire. Cool bumper assembly before working in front.

Vehicle Fire Tactic {Vehicle Fire Attack Tactic.pdf}

Vehicle Fire Slide Sequence {Vehicle Fire Slide Sequence.pdf}

## Scene Management

Develop your Incident Organization. What does your organizational chart look like? No freelancing. All personnel are assigned or in staging.

Maintain a reasonable Span of Control.

Establish Incident Zones and manage accordingly.

- Hot zone – area of maximum hazard, also called the incident action circle
- Warm Zone – transition activities, tool and equipment staging
- Cold zone – safe zone, ICP, rehab

Announce Tactical Benchmarks when they've been achieved.

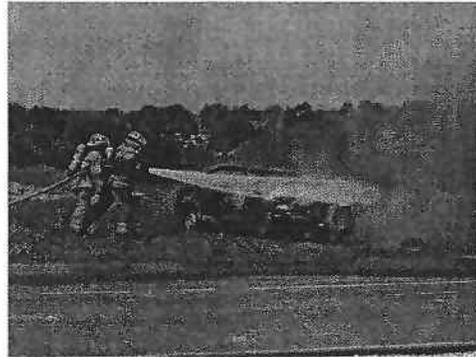


Figure 9a

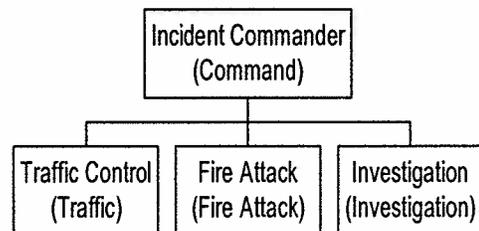


Figure 9b

---

## Mouse-Over Dialog Boxes

Staging A Staging Area is a temporary location at an incident where personnel and equipment are kept while awaiting tactical assignment. Resources in staging area are always available. That is to say, ready to go out on assignment immediately.

Span of Control The number of individuals managed by a single supervisor. The manageable span of control for one supervisor ranges from between three to seven individuals, with five as optimum.

Incident Control Zones The purpose of implementing incident control zones is to: secure a scene; establish perimeters; maintain safe and efficient control over operating personnel; and to prevent people, vehicles, and resource equipment from entering a threatening situation. The incident scene may be divided into three separate zones: HOT, WARM and COLD (safe). The hot zone (incident action circle) denotes the area of maximum hazard, the warm zone surrounds and includes the hot zone, and the cold zone is the unrestricted area beyond the boundaries of the warm zone.

## Tactical Benchmarks

Primary All Clear: primary search is complete

Secondary All Clear: secondary search is complete

## Officer Development Series – Managing Vehicle Fires

Water of the Fire: extinguishment of the fire has begun

Under Control: the event is controlled and can be managed with units that are on the scene.

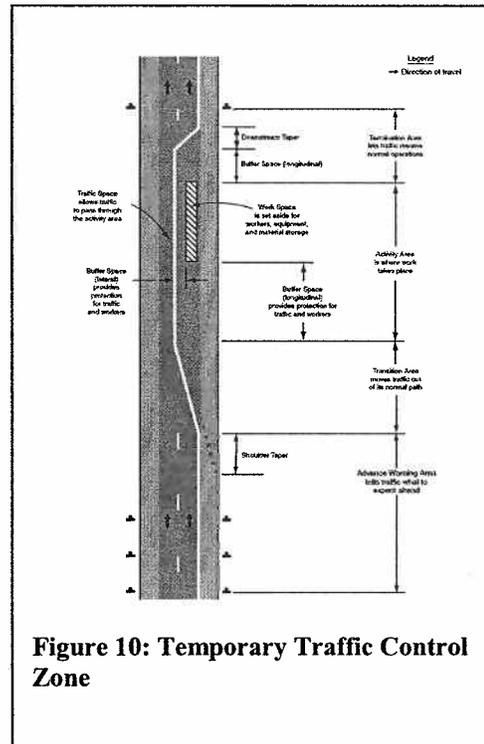
Loss Stopped: property conservation is complete.

## Scene Management

Include a Traffic Management Plan. Establish a Temporary Traffic Control Zone to protect the scene and control traffic movement. Minimize lighting that interferes with driver vision – turn off headlights and turn off strobes. Request Law Enforcement for traffic control.

The components of a TTC Zone are:

- Advanced Warning Area
- Transition Area
- Activity Area with Buffer Space
- Termination Area



**Figure 10: Temporary Traffic Control Zone**

## Mouse-Over Dialog Boxes

Temporary Traffic Control Zone an area of a highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel.

## Safety Issues

Remember our Risk Management Plan.  
Always approach the scene cautiously.  
Place apparatus to protect the scene and to maintain a buffer from the vehicle on fire.  
Implement traffic management.  
Halt all traffic if smoke is blowing across the roadway.  
Always wear your PPE.  
Establish incident zones (hot, warm, cold) at every incident.  
Be aware of Vehicle Fire Hazards.  
Choose the right attack line.  
Use the proper approach to the vehicle .  
Secure the vehicle with wheel chocks.  
Be aware of the weather – if its freezing you may need a load of ice melt\sand to make the roadway safe.  
Make sure the scene is left clean\safe for the general public.

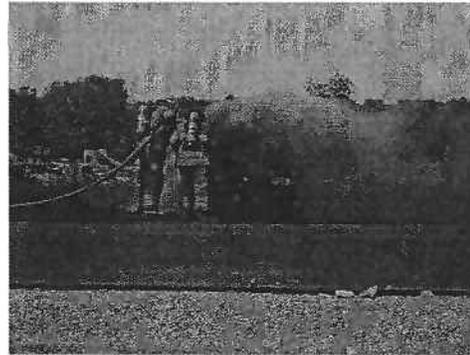


Figure 11

---

## Mouse-Over Dialog Boxes

Risk Management Plan Risk a lot to save a lot, Risk a little to save a little, Risk nothing to save that which is already lost.

Vehicle Fire Hazards Air bags, gas-filled cylinders, alternative fuels

**Demobilization**

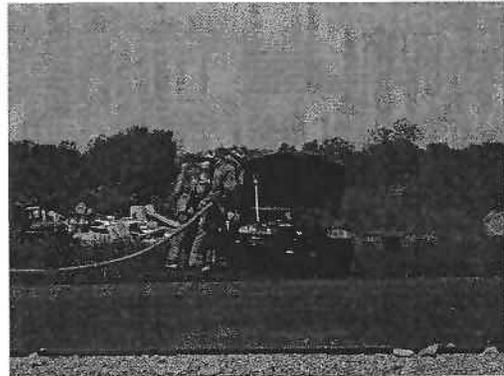
Maintain control of the incident until you depart or you transfer command.

Continue to manage traffic.

Arrange for the removal of the vehicle.

All personnel check out with Command

Leave the scene safe for the general public.



**Figure 12**

## Officer Development Series – Managing Vehicle Fires

### Standard Outcomes

Correct apparatus and personal vehicle placement.  
Traffic controlled.  
Safe scene.  
Everyone in PPE.  
Right hoseline to do the job.  
Proper attack approach.  
Secured vehicle.  
Fire out.  
Roadway safe for use.  
Scene left with responsible party or left safe for general public.  
Everyone goes home safe.



Figure 13

### **Manage This Incident**

Now we'd like for you to manage this incident. First, print the module worksheet. You'll use it to manage this incident.

#### Print the Worksheet

Scenario: It's a bright sunny day. At 2:00 p.m. the Communications Center dispatches a "Vehicle Fire" incident

Next, listen to the dispatch and response audio to this incident:

#### Dispatch/Response Audio

Now, **complete Section 1** of the worksheet.

---

### **Mouse-Over Dialog Boxes**

Print the Worksheet {Vehicle Fire Web Training Worksheet.pdf}

Dispatch/Response Audio {VFDispatchAudio2.wav}



**Figure 14**

**Manage This Incident**

You are the first to arrive at the incident scene and see a vehicle on fire at the end of a two-lane road where it intersects (T-intersection) with another two-lane road (see photo). What is your size-up?

**Complete Section 2 of the Worksheet.**

What are your strategic goals and your tactical objectives?

**Complete Section 3 of the Worksheet.**

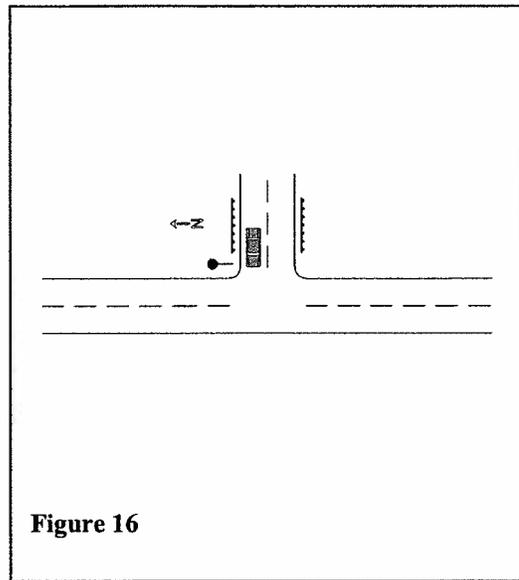


**Figure 15**

**Manage This Incident**

Where will you locate your Command Post? Engine 1401 and several firefighters in their personal vehicles are arriving at the scene. How will you manage them? Where would you position Engine 1401? Where should the firefighters park? What is your initial Traffic Management Plan?

**Complete Section 4 of the Worksheet.**



**Manage This Incident**

Give your first reporting crew their tactical order. What are your tactical orders to your first crew? Which hoseline will they use? Describe the approach the attack crew will make to extinguish this fire. What are the tactical benchmarks for this incident?

**Complete Section 5 of the Worksheet.**

Yourself, E1401, 4 firefighters and a law enforcement officer are on the scene. Describe your incident organization.

**Complete Section 6 of the Worksheet.**



**Figure 17**

**Manage This Incident**

Your fire attack crew is attacking the fire. What issues are you concerned about at this stage of the incident? List your top 5 safety issues.

**Complete Section 7 of the Worksheet.**



**Figure 18**

**Manage This Incident**

The fire is nearly out. What issues are you concerned about at this stage of the incident?  
How do you manage personnel demobilization?  
What must you do to ensure you leave the incident scene safe for the general public?

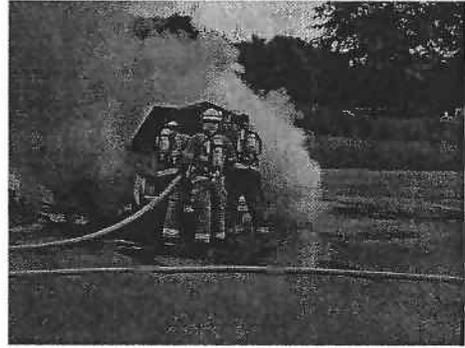
**Complete Section 8 of the Worksheet.**



**Figure 19**

**Did You Achieve These Standard Outcomes?**

- Correct apparatus and personal vehicle placement.
- Traffic controlled.
- Safe, protected scene.
- Everyone in PPE.
- Right hoseline to do the job.
- Proper attack approach.
- Secured vehicle.
- Fire out.
- Roadway safe for use.
- Scene left with responsible party or left safe for general public.
- Everyone goes home safe.



**Figure 20**

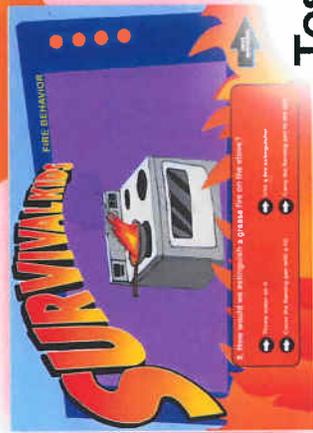
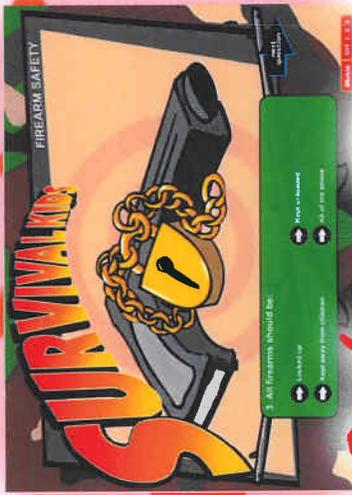
Take The Post-Test

---

**Mouse-Over Dialog Boxes**

Take The Post-Test {Vehicle Fire Post-Test.pdf}

# APPENDIX F



Test your knowledge of life safety skills.  
Go to [www.bcfldmo.com/survival\\_kids/](http://www.bcfldmo.com/survival_kids/)  
Complete all 8 lessons and get promoted to  
**Fire Chief!**



---

---

# Survival Kids Learning Activity

---

---



**Purpose:** FIREARM SAFETY Learning Activity

**Scope:** For 3rd & 4th grades

**Time Requirements:** One classroom period

**Learning Objectives:**

1. To develop safe firearm attitudes
2. To demonstrate knowledge of the correct method for dealing with firearms

**Curriculum:**

1. English
2. Math

**Teaching aids required for this lesson:**

1. Copy of lesson plan
2. Make your own story activity #2
3. Where we might find firearms activity #1
4. Firearm safety videos (2)
5. Math decoding activity #3
6. Parent handout

**Classroom requirements**

1. Pencil, crayons or markers, safe firearm, gun case, trigger lock

---

**INSTRUCTOR: SOME STUDENTS MAY BE UNCOMFORTABLE WITH THE GUN PROP. IF SO, BE SENSITIVE. WALK AROUND THE CLASS TO SHOW KIDS, NOT REAL GUN BUT TO HELP TEACH.**

**Instructional steps (Explain to students the following information)**

1. This month our SURVIVAL KID'S lesson goes a different route. Ask kids what we have talked about so far.

**ANSWER:** 9-1-1, fire science, exit drills, personal safety, cooling a burn

2. This month we are going to talk about firearms safety.  
? Who can tell me what a firearm is?

**ANSWER:** A gun or rifle or shotgun used to hunt or protect one self.

---

---

Survival Kids Learning Activity – FIREARM SAFETY

---

---

? What is a firearm supposed to do, what is it designed for? And it is one thing only.

**ANSWER:** To kill something, either to eat or protect oneself.

3. Before we can learn about the importance of firearm safety, we need to make a list of where we might find a rifle, or pistol, or shotgun that could hurt us.

**ACTIVITY:** **PASS OUT ACTIVITY #1: WHERE WE MIGHT FIND FIREARMS. HAVE CHILDREN COMPLETE AND THEN DISCUSS.**

4. Let's go over the worksheet activity. (**Verbalize why a gun would be found at the location**)

? How many of you have a gun, any type of gun in your house?  
**(Have them raise their hands)**

? How many of you know of a gun at your grandparent's house?  
**(Have them raise their hands)**

? How many of you know of a gun at a friend's house?  
**(Have them raise their hands)**

? How many of you know of a gun someplace else?  
**(Have them raise their hands)**

? Have any of you ever found a gun and been curious about it?  
**(Have them raise their hands)**

? Were you scared?

---

---

## Survival Kids Learning Activity – FIREARM SAFETY

---

---

5. You should think of guns as scary things. Because they can kill you if you or someone else is not careful. Our lesson will cover how to be safe around guns.

### **SHOW VIDEO #1 KOMU-TV NEWS STORY OF CHILD BEING SHOT ACCIDENTALLY IN A HUNTING ACCIDENT.**

6. This little boy was shot because the person with the rifle, THOUGHT it was unloaded.

A gun is NOT a toy; it is NOT something to play with, so the first thing we learn is;

**(Using gun as prop) TREAT EVERY GUN AS IF IT LOADED.**

- A gun may have a safety, but DON'T rely on that to keep the gun safe. YOU must keep it safe.

**IT IS UP TO THE USER TO HANDLE A GUN SAFELY.**

- Sometimes kids think that real guns are like toy guns, but toy guns don't kill!!
- If you find a gun at your house, don't touch it!

**WRITE ON BOARD (With Prop) TREAT EVERY GUN AS IF IT IS LOADED.**

- ? What should you do if someone points a gun at you, even if you think they are only playing?

**WRITE ON BOARD (With Prop) TREAT EVERY GUN AS IF IT IS LOADED.**

- ? If you are at a friend's house and they want to show you something special and it turns out to be a gun, what should you do?

**WRITE ON BOARD (With Prop) RUN AWAY, TREAT ALL GUNS AS IF THEY ARE LOADED**

---

---

Survival Kids Learning Activity – FIREARM SAFETY

---

---

**WITH PROP**

**POINT GUNS IN A SAFE DIRECTION, (EITHER UP TOWARDS THE AIR, OR DOWN TOWARDS THE GROUND)**

- ? How should you keep guns in your house? Should they be kept loaded and where people can easily reach them?

**GUNS AND AMMUNITION SHOULD BE STORED SEPARATELY AND OUT OF SIGHT**

**WITH PROP**

**DON'T STORE A FIREARM LOADED. (IF SOMEONE GOES TO GET IT AND THINKS IT IS UNLOADED, IT MIGHT GO OFF.)**

- ? How might we store a gun, let's say a pistol?

**SHOW THE GUN PROP, CASE AND TRIGGER LOCK.**

**ANSWER:**

**UNLOADED AND LOCKED IN A CASE OR LOCKED IN A CABINET. THEY SHOULD BE INACCESSIBLE TO CHILDREN.**

**SHOW VIDEO #2**

**SHOW SAFE FIREARM VIDEO  
#2 National Rifle Association EDDIE  
EAGLE animated video**

**ACTIVITY**

Pass out activity # 2, MATH CODE BREAKING EXERCISE  
Pass out activity # 3, "MAKE YOUR OWN STORY"

---

---

## Survival Kids Learning Activity – FIREARM SAFETY

---

---

### **REVIEW**

1. TREAT EVERY GUN AS IF IT IS LOADED.
2. A GUN IS NOT A TOY, IT IS MEANT TO KILL THINGS.
3. KEEP GUNS, ALL GUNS, UNLOADED AND LOCKED UP.
4. FIREARMS SHOULD BE STORED OUT OF SIGHT AND INACCESSIBLE TO CHILDREN.
5. IF ONE OF YOUR FRIENDS POINTS A GUN AT YOU, RUNAWAY AND TELL A GROWN UP.

**PASS OUT TAKE-HOME HANDOUT TO PARENTS**

**-END-**



**BOONE COUNTY  
FIRE PROTECTION DISTRICT**

# SURVIVALKIDS

"teaching life skills"

Parents  
Corner

Teachers  
Lounge

Lessons

Additional  
Information

**KIDS!**  
click here!

*Hey Kids!*

Test your knowledge of life safety skills. Complete each life safety exam and you will receive a fire department rank - starting with firefighter. Complete all 8 lessons and get promoted to the rank of Fire Chief!

**What is the Survival Kids Program taught by the Boone County Fire Protection District?**

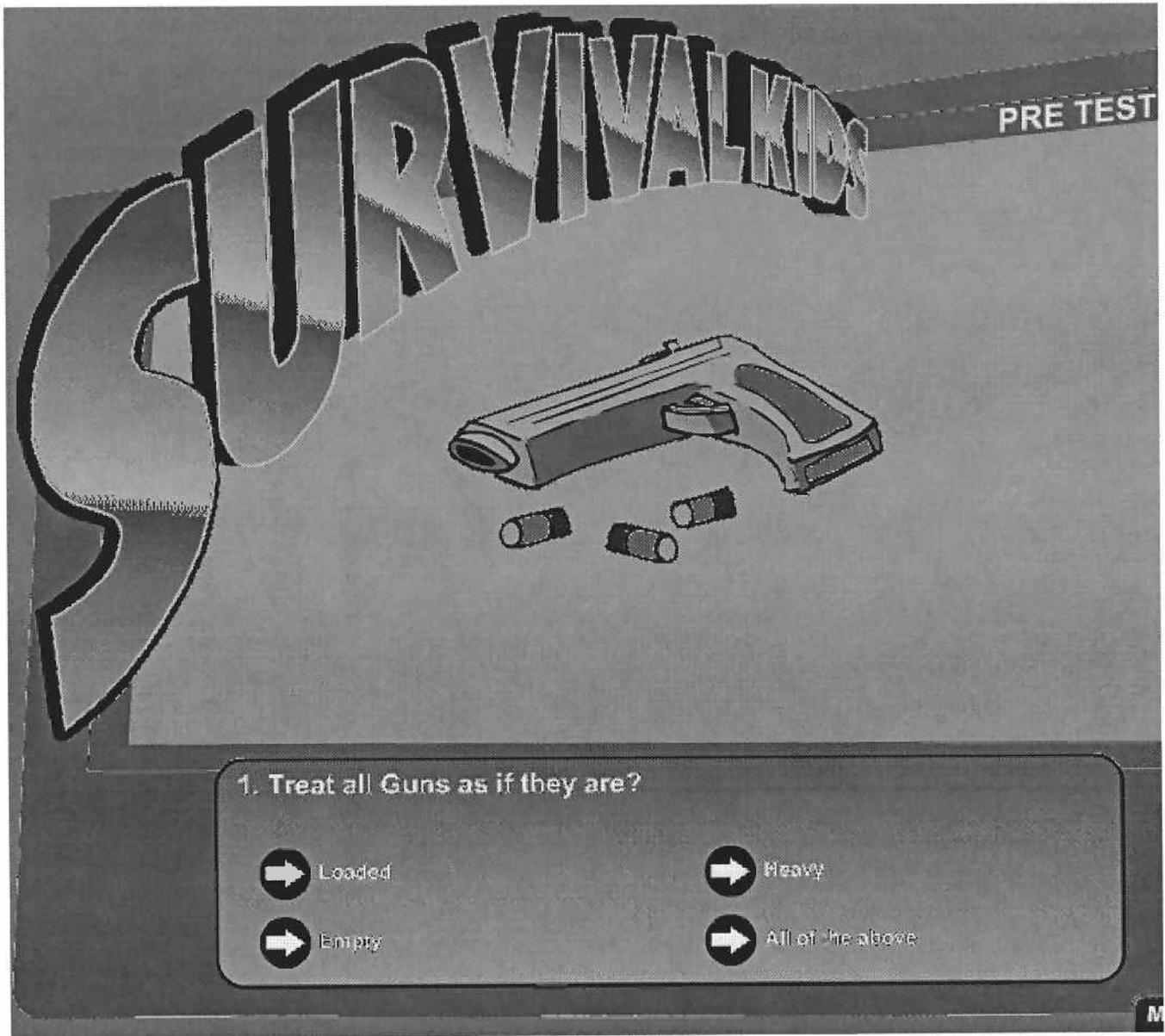
SURVIVAL KIDS is a fun and interactive educational program teaching life skills to elementary school age children. Patterned after the successful law enforcement "DARE" program, SURVIVAL KIDS places a trained firefighter into



each 4th grade classroom each month to teach an important life skill.

These eight lessons are taught by volunteer firefighters at each elementary school within the jurisdiction of the Fire District. Starting in October following National Fire Prevention Week, over 25 classrooms are visited each month through out the school year. This program was recognized by the International Association of Fire Chief's with the International Award for Excellence in 1996.

©2001 Boone County Fire Protection District, Columbia, Missouri



The graphic features the title "SURVIVAL KIDS" in large, 3D block letters at the top. Below the title, a handgun and several bullets are shown. In the upper right corner, the text "PRE TEST" is visible. At the bottom, a question is posed: "1. Treat all Guns as if they are?". Below the question are four radio button options: "Loaded", "Empty", "Heavy", and "All of the above".

1. Treat all Guns as if they are?

- Loaded
- Empty
- Heavy
- All of the above