
# WILDFIRE PREVENTION

## TEACHER'S GUIDE

# Texas Wildfire Prevention . . .

This Teacher's Guide, along with the *Texas Wildfire Prevention* CD-ROM, is designed to help you explore with your students the importance of fire to the ecosystem. We hope you find these tools useful as you and your students set out to discover how fire is used to properly manage and maintain an infinitely renewable resource... our forests. We are confident that you and your students will enjoy the challenges of this CD-ROM.

**** Register for a Wildfire Prevention Workshop at:**
**www. itm-info.com/wildfire**

**Texas Forest Service**
301 Tarrow, Suite 364
College Station, TX 77840-7896
Phone: 979–458–6606
Fax: 979–458–6610
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# INTRODUCTION

## PURPOSE

The *Texas Wildfire Prevention* CD-ROM, along with other software developed for forestry education, *Texas Forests Forever, Texas Forest Friends* and *Forest Fever*, is designed with one goal in mind--to educate. Using the CD-ROM to actively engage student learning will increase a student's understanding of the importance of fire in managing our ecosystems.

## THE *WILDFIRE PREVENTION* CD-ROM IS DESIGNED TO:

- Promote the importance of wildfire prevention;
- Show students that fire is vital to the health of ecosystems;
- Teach how prescribed fire benefits wildlife;
- Show how prescribed fire prevents disastrous wildfires;
- Provide an educational tool that can be used in the classroom to enhance critical thinking skills concerning the environment.

The CD-ROM offers a fun, attention-grabbing presentation of facts and information about fire and ecosystems. Built on interactive games, exercises and messages, this CD-ROM will help students understand how fire helps shape the natural environment.

## USE IN THE CLASSROOM

This Teacher's Guide is designed to assist the educator in using the CD-ROM. Presented in an easy-to-use format, the guide provides information to facilitate learning about fire. To assist in the learning experience, each of thecontent areas on the CD-ROM includes grade level, subjects, concepts, skills and correlations to state educational standards. A brief introduction to each topic is provided along with an activity to reinforce the content.

Using this CD-ROM and Teacher's Guide, along with the contact list provided and a little imagination, the educator can lead students into an exploration of many subjects. Together, they can go well beyond merely understanding the role that fire has played (and continues to play) in shaping ecosystems and providing habitat for wildlife.

The *Texas Wildfire Prevention* CD-ROM is primarily designed for use in 4$^{th}$- 6$^{th}$ grade classrooms, but can be used with a wide variety of audiences. It is primarily intended for single-user or small group settings.

## REQUIRED COMPUTER EQUIPMENT

The minimum and recommended system requirements are listed on the back of the CD-ROM case for both IBM-compatible and Macintosh computers. Your computer must meet these requirements in order to operate

# INTRODUCTION (CONTINUED)

### INTRODUCTION VIDEO

The CD-ROM begins with a video that describes the benefits of fire and how important fire is to forests and grasslands. It explains that forests and grasslands need to have sunshine, water and fire. The introduction video also describes how some fires are good and some are bad. It gives the students a preview of the information they will learn by using the CD-ROM.

### PRETEST/POST-TEST

The students take a pretest that measures their current knowledge of the benefits of fire to forests and grasslands. Their scores are recorded in a database that teachers can access. After the students complete the four content areas of the CD-ROM, they take a post-test that evaluates what they have learned. While completing these tests is optional, it gives teachers the ability to evaluate the students' understanding of the concepts contained in the CD-ROM. Pre- and post test scores are saved in a text file on the computer desktop called "wpscores."

### LOG-IN EXERCISE

This exercise, also optional, offers students the opportunity to register as users of the CD-ROM. By completing this simple exercise where students supply their names and other information, a database is built for the teacher's use.

### INSTALLING THE WILDFIRE PREVENTION CD-ROM

IBM-COMPATIBLE PC COMPUTERS- Place CD-ROM into the CD-ROM drive. From My Computer, click on CD-ROM DRIVE: WILDFIRE PREVENTION. Select INSTALL and follow directions generated by the installation program. Install QUICKTIME as directed. Once installed, a Wildfire Prevention icon will be placed on the desktop for activation by double-clicking.

MACINTOSH COMPUTERS- Place the Wildfire Prevention CD-ROM in the CD-ROM drive. Double-click on the desktop folder that is created. If QUICKTIME is not already installed, install it from the folder.

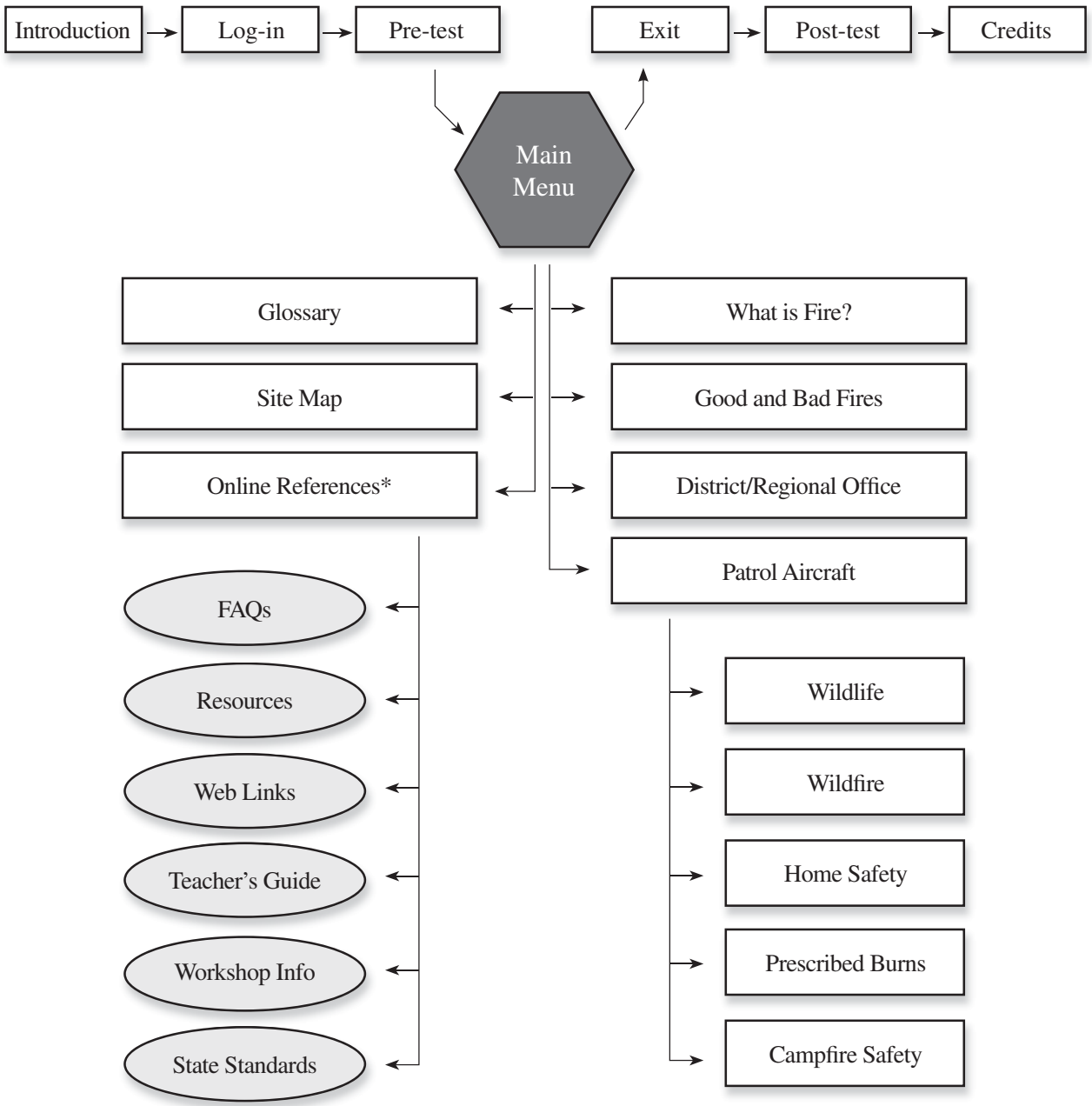
**In some sections of this guide, enrichment material is indicated by a box around the paragraph. The material may not be included in the audio scripts of the CD-ROM; however, the instructor should teach this material prior to giving the student assessment.**

### USER-TIPS

COMPUTER MONITOR RESOLUTION- The Wildfire Prevention CD-ROM was developed at 640 x 480 monitor resolution. If the picture does not fill the screen, you will have to adjust your monitor resolution to this setting. Please consult your monitor guidelines for instructions. If your screen appears dark, you may want to adjust the brightness/contrast settings.

NAVIGATION- In some cases, students cannot manipulate items in the activities screens until the audio instructions have ended.

# CD-ROM Flow Chart




* Internet access is required to view the Online References section.

# WHAT IS FIRE?

In this section students will learn about:

- Ecosystems
- The fire triangle and components necessary for a fire to exist.

Over 13 million acres of Texas are covered with forests. Although the state's abundant rain and sunshine are vital to the survival of forests, another element is necessary to maintaining them...fire. Over thousands of years, forests have developed because of the presence of fire. In fact, many ecosystems require fire in order to exist.

To have fire, three ingredients are needed: oxygen, fuel and heat. Removing any of these three ingredients will extinguish a fire. The "fire triangle" shown in the CD-ROM is a visual way of depicting the needs of fire.

For a fire to burn, the air around it must be at least sixteen percent oxygen. Therefore, Earth's atmosphere, at about twenty-one percent oxygen, provides plenty of oxygen to sustain a fire. Removing the oxygen, for example by putting dirt on a fire, smothers it.

Fuel is supplied by woody debris and other plant matter like limbs, leaves and pine needles in the forest. The build up of debris on the forest floor can lead to excessive, dangerous fires. Fuel can also come from buildings and other structures.

Heat is supplied through a number of mechanisms, including lightning, campfires, cigarettes and debris burning.

A wildfire is a fire that burns out of control in forested or wildland areas and destroys anything in its path. Approximately 2-5 percent of wildfires in the US are started by lightning. Sadly, arson, the crime of maliciously setting a fire to damage or destroy property or buildings, is a major cause of wildfires as well.

Fire is an important part of the ecosystem. In fact, there are about 1,000 wildfires in Texas every year. Managing fire to protect the citizens as well as provide many benefits to our natural resources is an important part of the job of the Texas Forest Service.

In the *What is Fire?* activity on the CD-ROM, students are asked to help put out a fire by smothering it (removing the oxygen from the fire). When they successfully extinguish the fire, they are allowed to move into the next content area of the CD-ROM.

## Sample Activity

Use a candle and a glass jar to show how the three elements of the fire triangle, oxygen, fuel and heat, are necessary to sustain fire.

1. Place a small candle inside a glass jar. Melt the bottom of the candle and use that to attach it to the bottom of the jar. *Note: It may be safer for younger students to use a tea candle*. After lighting the candle, place the lid on the jar. The flame will go out as the oxygen inside the jar is used.

2. Relight the candle and leave the lid off the jar. Allow the candle to burn until the fuel (the wax) is consumed and the flame goes out. This is an example of removing the fuel from the flame.

3. Use water to put out the candle. This removes the heat source, which is necessary to have a fire.

*continued >*

**Levels**
Grades 4-6

**Subjects**
Science, Language Arts, Math

**Concepts for Students to Learn:**

- Fire requires oxygen, heat and fuel in order to burn
- Fire is an important part of the natural environment.
- Fire has shaped the development of forests and grasslands for thousands of years.

**Skills**
Observing, Relationships, Patterns, Organizing Information and Analyzing

**Texas Essential Knowledge & Skills (TEKS)**

Science
4th Grade- 1a, 2, 5a-b
5th Grade- 1a, 2, 8a
6th Grade- 1a, 2

Math
4th Grade- 2d, 5a
5th Grade- 2b, 4a
6th Grade- 2b, 4a

Language Arts
4th Grade- 1 a-c
5th Grade- 1 a-c
6th Grade- 1 a-c

# WHAT IS FIRE? (CONTINUED)

4. Relate the burning candle to wildfires. Do this by discussing the fire triangle, the necessary components of a fire and how all these things can be found in forests and grasslands.

***Extension*** Demonstrate additional principles by timing how long it takes for the fire to go out using different sized jars (group the students and give each student a jar but all the jars within a group are the same size). Have students time how long it takes before the flame goes out, average the number for that group, then have the whole class graph their results. This introduces concepts of hypothesis, data collection, data analysis, concept of average (or mean, median—depending on age level), and pictorial display of data to increase comprehension. Have the students write about their experiment.

***Math*** 13 million acres of a state's 35 million total acres are forested. What percentage of the land base is covered with forests? *(37.1%)*

If 2% of the 1,000 yearly wildfires in the US are started by lightning, how many fires are caused by factors other than lighting each year? *(980)*

# STUDENT ASSESSMENT - WHAT IS FIRE?

**Name:_____**

1. List three things that <u>forests and grasslands</u> need to survive:

   _____, _____, _____

2. A fire needs the air to be at least _____ oxygen in order to burn and Earth's atmosphere is approximately _____ oxygen.

   a) 3%, 42% b) 9%,18% c) 16%, 21% d) 23%,5%

3. In Texas, there are about _____ wildfires each year.

   a) 1,000 b) 3,000 c) 5,000 d) 10,000

4. What percent of wildfires in the US are started by lightning?

   a) 10% b) 2-5% c) 45% d) 60%

5. The "fire triangle" consists of all of the following, *except* for:

   a) lightning b) fuel c) heat d) oxygen

*Match the word on the left to the definition.*

____6. Fuel a) To remove oxygen from a fire

____ 7. Smother b) A fire that burns out of control in forested or wildland areas and destroys anything in its path

____ 8 Ecosystem c) Material that burns like dead limbs, trees, buildings and even pine needles and leaves

____ 9. Wildfire d) An ecological community and its physical environment

10. Discuss ways that fire affects your life today.

# GOOD FIRES AND BAD FIRES

In this section students will learn about:

- Distinguishing between good fires and bad fires.

## GOOD FIRES

We don't normally think of fires as being "good," but in some instances, they are very beneficial. Thousands of years ago, man first used fire as a source of warmth, cooking and light. Today, we still use fire in a fireplace or furnace to keep us warm, fire in a grill or gas stove is used to cook and candles and lanterns are sometimes used as a light source, especially during a power outage. Some fires, called prescribed burns or prescribed fires, are even used to control the growth of unwanted vegetation in forests. The importance of prescribed fires, introduced in this section is discussed in detail in the "Patrol Aircraft" section of the CD-ROM.

## BAD FIRES

A fire that burns out of control and destroys anything in its path is an example of a bad fire. Wildfires fall into this category. Texas has about 1,000 wildfires that burn many thousands of acres annually.

In Texas there are three main causes of wildfires. These are escaped debris fire, equipment use (including welding, hay baling, and vehicle caused), and arson. Escaped debris fire is the #1 cause of wildfires in Texas.

The leading cause of wildfire in Texas is escaped debris fire. Careless burning of leaves that results in escaped fire, or campfires that get out of control are other examples of fires caused by man that destroy our forests.

**Arson is a crime.** It is the crime of maliciously setting a fire to destroy or damage property or buildings. Persons convicted of arson pay heavy fines and are imprisoned if convicted.

The most common non-human cause of wildfires is lightning. It causes approximately 2-5 % of wildfires. While little can be done to protect against wildfires caused by lightning, some steps can be taken to minimize the damage. Prescribed burns and frequent checks of forested and grassland areas after lightning storms and during periods of high fire danger are some of the things foresters can do to control the damage caused by lightning strikes.

## Sample Activity

1. Have the students use the Internet links in the reference section of the CD-ROM to find information about fire. They can look for information about wildfires (fire history, statistics, prescribed burning and forest fire laws) at the Texas Interagency Coordination Center website. If they do not have Internet access, they can use a library, contact resource professionals, fire fighters/EMTs, etc.

2. Use the above information to have the students, in teams or individually, debate the importance of wildfire prevention. You can give them leading questions to begin the debate, or have each team look up topics that they must defend.

3. Students can use the information gathered in their research to write papers or prepare posters documenting the importance of fire in our lives. Have them present these to the class in an oral report.

4. ***Writing Activity*** Have the students research in newspapers, magazines and other sources about actual fires, good and bad. Have students write about what they learn about the impact of fire on our lives.

**Levels**
Grades 4-6

**Subjects**
Science, Math, Language Arts

**Concepts for Students to Learn:**

- Fire has been used by man to improve the quality of life for thousands of years.
- When fire is uncontrolled and unplanned, it can have disastrous consequences.
- Arson is a crime punishable by imprisonment and fines.
- How prescribed fires/ burns can be used to manipulate an ecosystem.
- The importance of prescribed fire in preventing destructive wildfires.

**Skills**
Observing, Relationships, Patterns, and Analyzing

**Texas Essential Knowledge & Skills (TEKS)**
Science
4th Grade- 3 a-b, 5 a-b
5th Grade- 3 a-b, 5 a-b
6th Grade- 3 a-b, 5 a-b

Language Arts
4th Grade- 8 b,c
5th Grade- 10 a,b,g,h,j,k,l; 13, 15, 19, 21
6th Grade- 8, 10 a, b, j,l,m; 13, 15, 19

# STUDENT ASSESSMENT - GOOD FIRES/BAD FIRES

**Name:_____**

1. Fires have been used by man for thousands of years as a source of _____,

   _____, and _____.

2. List the three main causes of wildfires in Texas:_____, _____

   and _____.

3. _____ is the #1 cause of wildfires in Texas.

   a) arson b) lightning c) escaped debris fire d) campfires

4. Unlike with wildfires, foresters can control and closely monitor the effects of

   _____ fires.

5. _____ is the most common non-human cause of wildfires.

*Write "good fire" or "bad fire" in the blank.*

_____ 6. A prescribed fire

_____ 7. A fire used to cook or for warmth

_____ 8. A wildfire started by lightning

_____ 9. A fire that destroys houses, the forest or people's property

10. Write a paragraph explaining why a forester would intentionally start a fire in the forest.

# DISTRICT/REGIONAL OFFICE

In this section students will learn about:

- Work done by the Texas Forest Service
- The purpose of District/ Regional Offices

This video describes the place where forestry officials work, make land management plans, and keep equipment.

Many areas of the state have District/ Regional Offices where foresters and forest technicians work. These forestry professionals are there to respond to wildfires and to help landowners make wise decisions regarding the management of their natural resources.

District/Regional Offices maintain all of the necessary equipment for forest technicians to use in fighting fires. Equipment shown in the video segment for this content area includes:

- Crawler tractor and fire plow
- Crawler tractor on truck transport
- Brush truck

Forest technicians are dispatched to (sent to) wildfires when fires are reported by:

- Patrol airplanes
- Citizens who call 911

At District/Regional Offices, forestry officials calculate *Fire Danger* based on the wind, temperature, relative humidity, how dry the forest is and the chances of a fire getting out of control. When weather conditions are severe, a Red Flag Warning is issued by the National Weather Ser vice indicating that conditions are right for extensive, large and potentially dangerous wildfires.

**Sample Activity**

Use the contact list provided in this guide to invite a number of resource professionals to your classroom. In addition to Forest Service employees, be sure to include industry foresters and firefighters from your city or county fire departments.

Ask them to share information about careers in their field, such as: job qualifications and education, what they do on a day-to-day basis, field work vs. office work, opportunities for advancement, etc.

Have each student choose a career in natural resources and write about it. If time permits and the ages of the students are appropriate, do some of the following activities with your students:

1. Have students interview a resource professional, either over the phone or in person. Have them prepare a report on the career of the person they interviewed.

2. Have the students seek out a resource professional and invite that individual to the class. Ask each student to prepare and present an introduction for the person they invite, take notes and prepare a brief written report about that career.

3. Have the students go to the library or other sources of information and find information on careers in forestry/natural resources. Have them prepare a report with that information.

4. Have the students pretend to be foresters, forest technicians, wildlife biologists, etc. Have the students tell about a "day in the life of a ___ _____."

**Levels**
Grades 4-6

**Subjects**
Science, Social Studies, Language Arts

**Concepts**

- The diversity of careers available in natural resources/forestry.
- The importance of forestry professionals in controlling/ preventing wildfires.
- The importance of studying and preparing for a career.

**Skills**
Observing, Classifying and Categorizing, Evaluating

**Texas Essential Knowledge & Skills (TEKS)**

Science
5th Grade- 6a

Social Studies
4th Grade- 9, 13, 14a, 21, 23
5th Grade- 9, 12, 14, 24, 26
6th Grade- 7, 9, 20a,21,22

Language Arts
4th Grade- 1,2,3a,b,d,f; 13, 15, 19,21
5th Grade- 1,2,4a,b,d,f; 13,15, 19, 21
6th Grade- 1,3,5a,b,d,e,f; 10a, 11, 15, 18,20

# STUDENT ASSESSMENT - DISTRICT/REGIONAL OFFICE

**Name:_____**

1. A _____ _____ works at the District/Regional Office and is responsible for planning when and how to conduct prescribed burns..

2. List two types of equipment kept at District/Regional Offices:_____

   and _____.

3. In Texas, landowners are issued burning _____ by the Texas Forest Service for conducting outdoor burning of trees piled from land clearing.

4. Fire danger is influenced by all of the following *except*:

   a) Relative Humidity b) Temperature c) Wind d) Air Quality

5. What type of career in the natural resources field would you enjoy, and why?

# PATROL AIRCRAFT

In this section students will learn about:

- Wildlife
- Wildfires
- Campfire Safety
- Prescribed Burns
- Home Fire Safety

The patrol aircraft gives students a view of the forest from a virtual fire patrol airplane where fire crews help protect the forests from bad fires. The directions instruct the students by saying, "You're now in the cockpit of a plane flying over Texas. From here you can learn more about how to prevent disastrous wildfires. Click and drag on the steering wheels to turn the plane in the direction you want to go. Use your mouse to seek out areas that may need your attention. You'll know you have found one of the five active spots when you see a title appear in the cockpit's information panel. Click on that spot to take a closer look and learn more."

The patrol aircraft also has a button to hear the directions again, and a button for accessing the online references. The exit button will take the student back to the main menu.

***Prescribed Fire***

One of the most important reasons to conduct a prescribed burn is to limit the damage caused by wildfire. As discussed earlier, wildfires are unpredictable and dangerous. Fuel, such as dead limbs, leaves and thick vegetation builds up in a forest over time. It is necessary to reduce this fuel by allowing it to burn in a controlled manner.

Also, a prescribed fire can be used to prevent vegetation from growing tall enough to become a "ladder fuel." Ladder fuels carry fire from the ground to the tops of trees and cause crown fires, which are devastating. Prescribed fire under controlled circumstances is the best way to reduce fuel loads and prevent damage to the forest and people's homes.

Another reason to conduct a prescribed burn is to manipulate an existing forest or grassland. Some species of trees and plants need fire in order to reproduce. For example, fire is needed to melt the resin that holds the seeds of some pine species, like sand pine, inside the cone. These seeds remain dormant in the cone until a fire occurs. After the heat of a fire releases the seeds, new seedlings can begin to grow. This is nature's way of ensuring that the forest floor is ready to support a new forest... the fire removes vegetation that would compete with the seedlings.

Also, some types of pine seedlings (longleaf pine) will not grow until a fire has "released" them. Fire serves to reduce competition--killing the vegetation that shades the forest floor and competes with seedlings for sunlight, nutrients and water. Thus, fire tolerant species like longleaf pine have a competitive edge in these ecosystems, to the extent that a longleaf pine ecosystem cannot even exist without fire.

This is how many forests have evolved. Prescribed fires are often used to help a plant species reproduce and allow a particular type of forest to develop, thus imitating natural fires that occurred before man inhabited this area.

Prescribed fire may also be used for other reasons. The control of certain insects, invasive plant species, and diseases of plants can be accomplished with fire; when landowners want a particular species of trees, usually pines on their land, fire is often used to eliminate an undesirable species of tree; fire may also be used to create meadows in a forest where shrubs and

**Levels**
Grades 4-6

**Subjects**
Science, SLanguage Arts, Social Studies, Math

**Concepts**
- Plants and animals develop ways to protect themselves from fire.
- Fire is a useful tool to help protect our forest resources, homes and property.
- Fire helps to shape the ecosystem.
- Man can use fires to imitate nature.
- Fire, despite its many important uses, poses many dangers and we must prepare for them.
- Certain steps must be taken to protect our life and property.

**Skills**
Observing, Classifying and Categorizing, Evaluating

**Texas Essential Knowledge & Skills (TEKS)**

Science
4th Grade- 5, 8, 10
5th Grade- 5,9
6th Grade - 5, 11, 12b

Social Studies
4th Grade- 7, 9, 13, 21, 22, 23, 24
5th Grade- 9, 12, 24, 25, 26, 27
6th Grade- 9, 10, 20, 21, 22, 23

Math
4th Grade- 12
5th Grade- 11a,b; 14 a-d
6th Grade- 6 a-d; 11 a-d

Language Arts
4th Grade- 15a,d,e,f,g
5th Grade- 15a,d,e,f,g
6th Grade- 15a,d,e,g

# PATROL AIRCRAFT (CONTINUED)

herbs may grow to provide needed food and cover for species of wildlife.

***Planning a prescribed fire***

In this content area, computer demonstrations illustrate the many factors that must be accounted for when foresters plan a prescribed fire. These include the speed and direction of the wind, the temperature and relative humidity, the kinds of fuel present, the moisture content of the fuel and the type and amount of personnel and equipment available to manage a prescribed burn.

The first thing foresters must do is establish a **firebreak**. This can be either a natural structure like a creek or a man-made structure like a road. They then set a **backing fire,** which is a fire that burns slowly, against the wind. The **blackline**, a burned area between the backing fire and the firebreak, is created as the backing fire moves away from the firebreak. Foresters then start several small **spot-head fires** at the other end of the area to be burned. These fires join together and advance toward the backing fire. Foresters are constantly on guard to make sure the fire stays under control and in the planned areas.

***Wildfires***

Dry and windy conditions are often the precursors of wildfires. Dryness makes the fuel in the forest ignite easier and wind helps spread fire. Such conditions are called periods of "high fire danger."

When a wildfire is spotted, generally by an airplane patrolling for wildfires or a citizen, forest technicians act quickly to control and extinguish the wildfire. They must determine what equipment they will need to control the wildfire, provide for the safety of those fighting the fire and nearby residences, plow the necessary firebreaks and sure the fire is completely out.

A computer demonstration of the effects of fire illustrates how different forests would look if fire were excluded from them. The demonstration compares a pine forest that has been prescribe burned every three years to one that has not received any planned fires. Students see that years of accumulated vegetation (fuel) where fire was excluded led to total destruction of the forest.

To conclude this section of the CD-ROM, students are asked to take a short true/false quiz regarding prescribed fire. Please evaluate the statements below:

1. Prescribed burning is a good forest management tool. ***True***
2. Prescribed burns reduce the amount of fuel available for a wildfire. ***True***
3. Prescribed burns are good for ecosystems. ***True***

***Outdoor Fire Safety***

Outdoor fire safety is an important part of preventing wildfires. Below are some rules discussed that will help prevent a campfire from getting away from you.

- Remember to put the fire out completely before you leave.
- Build the fire away from overhanging branches, limbs, etc. and stack wood away from the fire.
- Don't play with matches.
- Keep plenty of water and a shovel near the fire.
- Scrape away leaves, branches and other flammable material from within a 10 foot diameter circle.
- Never leave a fire unattended.
- Put the fire out with water and dirt and stir the remains. Make sure all the burned material has been extinguished and cooled.

***Wildlife***

Our beautiful forests and grasslands support a greatvariety of wildlife. These animals have evolved to live with fire. They are usually able to hide or escape during prescribed fires. Animals such as deer, bear and foxes run away from slow moving prescribed fires. Other animals that cannot escape by running, hide in underground burrows, logs or ponds. Rats, mice, shrews, snakes, lizards and turtles are all examples of animals that use this technique to escape fire.

***Home Fire Safety***

Due to the risk of wildfire, it is important for people who live in or near wildlands to take precautions to protect their homes and property.

A home's proximity to the wildlands is the most important factor in predicting the danger it faces from wildfire. The CD-ROM illustrates an urban wildland interface home that has many fire hazards. Students are to make the house "firewise" by clicking on and removing the hazards they detect. Below are some things homeowners can do to protect their property.

- Trim tree branches that touch the roof and are less than ten feet from the ground.
- Keep leaves, dead limbs etc. from collecting on the roof or around the house.
- Do not stack firewood near the house.
- Don't use bark or wood chips as flower bed mulch near the house.
- Do not use wood shingles.
- Equip the house with smoke detectors.

# PATROL AIRCRAFT (CONTINUED)

- Observe proper procedures and local laws for burning debris.
- Work with foresters conducting prescribed burns.
- Keep tools, especially a rake, shovel, bucket, hose and ladder, available for help in fighting a fire.
- Make sure the address is visible from the street so emergency vehicles can find the home easily.
- Control height of grasses

## Sample Activity

Using the "Safety Check Sheet" on the next two pages, have your students determine how "firewise" their house is. Then use that information to have each student develop fire safety plans for their house and share them with the class.

***Writing Activity*** Assign each student to be a type of animal found in the forest. Have them describe, from the animal's point of view, seeing and trying to escape from a fire in their forest home. Ask them these questions: what do you see, hear and smell? What will you do to escape? How will your life be different after the fire? Where will you live?


***Math Activity*** Have the students solve the problems below.

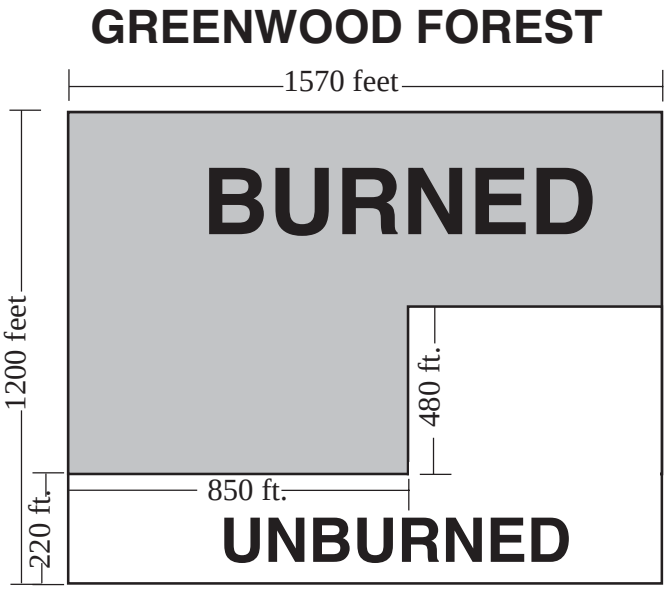
1. Before starting a campfire, it is recommended that you clear the debris within a circle with a ten foot diameter. Following that recommendation, what is the distance from the fire in the drawing below, to the edge of the circle (the diameter of the circle is 10 feet)? How much area (in square feet) is cleared around the fire?

2. If the shaded area of Greenwood Forest below represents a wildfire, what is the area (in square feet ) of the forest that burned in this fire? What is the area (in square feet) of the forest that did not burn? Convert these calculations to acres. (There are 43,560 square feet in one acre.)

**Answers:**

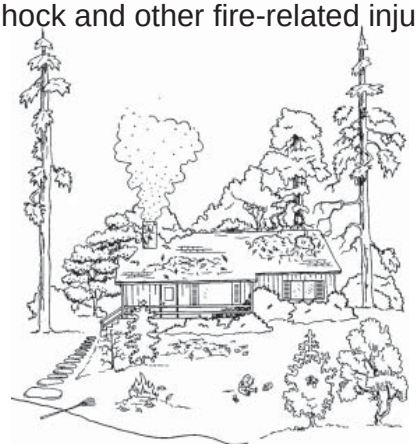
1. The fire is approximately 5 feet from the edge of the circle. The area of the circle is 78.5 square feet.

| | |
|---|---|
| 2. Total area | 1,884,000 square feet<br>43.25 acres |
| Burned area | 1,193,000 square feet<br>27.39 acres |
| Unburned area | 691,000 square feet<br>15.86 acres |



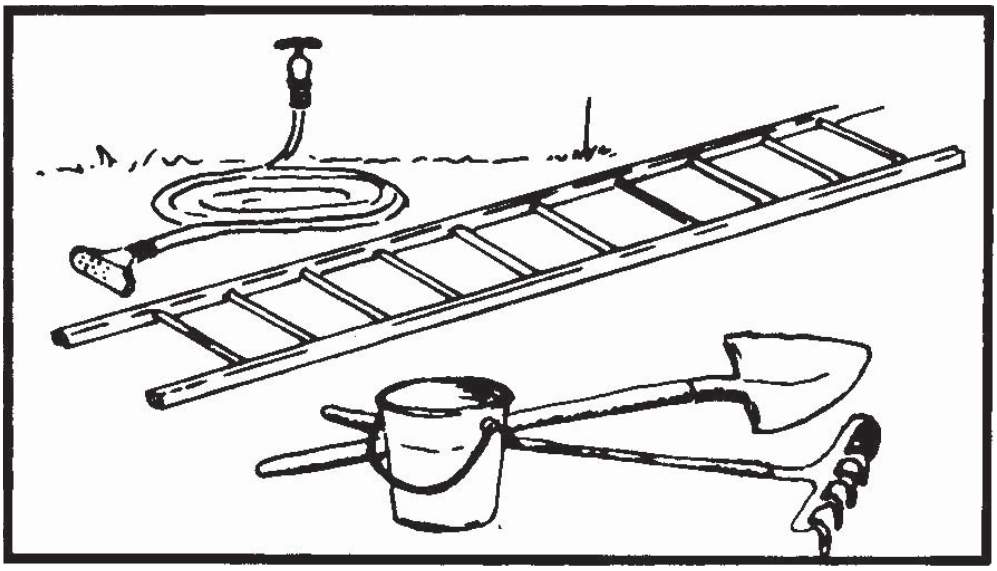
# FIRE SAFETY CHECK LIST (INSIDE)

| ***Inside your house, do you . . .*** | **Yes** | **No** |
|---|---|---|
| Know how to give directions to your house to the local fire department? | ❑ | ❑ |
| Have written directions posted near the phone in your house? | ❑ | ❑ |
| Keep flammable material at least 24 inches away from the fireplace and other sources of combustion? | ❑ | ❑ |
| Cover fireplaces with screens or glass to prevent sparks from getting out of the fireplace? | ❑ | ❑ |
| Have the chimneys cleaned annually? | ❑ | ❑ |
| Remove wires running under carpets, through doorways, near heaters, etc.? | ❑ | ❑ |
| Replace damaged electrical cords and plugs? | ❑ | ❑ |
| Allow appliances to cool before leaving or storing? | ❑ | ❑ |
| Provide sufficient air space around appliances like televisions, radios, etc.? | ❑ | ❑ |
| Caution guests about smoking in bed? | ❑ | ❑ |
| Store combustible materials in appropriate places, away from heat sources? | ❑ | ❑ |
| Discard garbage properly to avoid the accumulation of fuels? | ❑ | ❑ |
| Have fire and smoke alarms in appropriate places throughout the house? | ❑ | ❑ |
| Replace the batteries in fire and smoke detectors twice a year (when the time changes in the spring and fall)? | ❑ | ❑ |
| Have an escape plan to insure that each family member could get out of the house in the event of a fire? | ❑ | ❑ |
| Have fire extinguishers in appropriate places and know how to use them? | ❑ | ❑ |
| Know the meaning of Stop, Drop and Roll? | ❑ | ❑ |
| Know proper first aid for burns, shock and other fire-related injuries? | ❑ | ❑ |



# FIRE SAFETY CHECK LIST (OUTSIDE)

| ***Outside your house, do you . . .*** | **Yes** | **No** |
|---|---|---|
| Keep a thirty foot zone of defensible space around your house? | ❑ | ❑ |
| Keep tree limbs and leaves cleaned off of your roof? | ❑ | ❑ |
| Have spark arrestors on your chimney and prune limbs that are within 15 feet of the chimney? | ❑ | ❑ |
| Keep branches cleared from around powerlines (make sure the power company handles this one)? | ❑ | ❑ |
| Store firewood and other burnable material away from your house? | ❑ | ❑ |
| Burn debris under the proper weather conditions (low winds and high humidity)? | ❑ | ❑ |
| Follow the laws applicable to burning of yard trash like leaves and limbs? | ❑ | ❑ |
| Stay with all debris or barbecue fires at all times until they are properly extinguished? | ❑ | ❑ |
| Refuel equipment only when the engines have cooled? | ❑ | ❑ |
| After fueling equipment, move it to another area to start? | ❑ | ❑ |
| Supervise children playing with fireworks? | ❑ | ❑ |
| Have an outside source of water to put out a fire? | ❑ | ❑ |
| Have tools like rakes, shovels and ladders in a convenient place to put out a fire? | ❑ | ❑ |



# STUDENT ASSESSMENT - PATROL AIRCRAFT

**Name:_____**

1. Periods of time when a wildfire is very likely to occur due to weather conditions and the condition of the forest are called periods of _____ _____ _____.

2. Prescribed fire is often used to do all of the following *except:*
   a) reduce the amount of fuel in the forest
   b) burn houses and buildings
   c) control insects and diseases of plants
   d) help desirable plants reproduce

3. _____ _____ carry fire from the ground to the tops of trees.

4. Animals are protected from slower moving prescribed fires in which two ways? _____ and _____.

5. List the most common ways that wildfires are reported to the Texas Forest Service: _____, _____, _____.

6. In a prescribed burning, the _____ is the burned area between the backing fire and the firebreak.

7. The recommended area to clear around a campfire is a circle with a _____ foot diameter.
   a) 4 b) 8 c) 10 d) 100

8. To make your home *"firewise"* you should:
   a) Equip the house with smoke detectors and change the batteries twice a year
   b) Avoid stacking firewood near the house
   c) Replace wooden shingles with more fire resistant ones
   d) All of the above

9. Imagine that this happened in your neighborhood. Two of your classmates found a box of matches on their way home and took a shortcut through a wooded area. There, the two of them built a fire with notebook paper. Although they meant no harm, the fire quickly became large and spread to the woods and then moved toward nearby homes where the fire destroyed a family's home. Discuss as a group:
   (1) How the two students would feel
   (2) Whether this was arson or not
   (3) Who would be responsible
   (4) What hardships this would create for the family who lost their home

10. Develop a fire safety plan for your house. Draw the floor plan of your house and show how each person who lives with you could escape if a fire happened.

# GLOSSARY (BOLD TERMS APPEAR ON CD-ROM)

**Arson fire** – A fire set on purpose by anyone to burn vegetation or property.

**Backfire** – A fire-suppression technique of creating a firebreak by burning all fuel between the existing fire line and the oncoming fire. It can also be used to change the direction and the force of the fire convection column.

Brush truck – A light truck with a water-pump and a limited supply of water used for off-road fire suppression.

Burning conditions – The environmental factors that affect fire, such as weather and drought or fuel moisture.

Burning index – A number that describes anticipated fire behavior and how difficult it will be to control the fire.

**Canopy** – The leaves and branches making up the "roof" of the forest.

**Combustible material** – Any material that can catch on fire and burn.

**Combustion –** The act of burning.

Contain a fire – An effort to prevent further spread of the fire.

Control a fire – A fire is considered "controlled" when it is completely surrounded by a "control line," which is expected to keep the fire from spreading further.

**Control line** – Also often called a "fire line," this includes lines constructed by firefighters as well as natural barriers to fire such as rock outcroppings, roads and streams or other water bodies. Crews construct fire lines by using shovels, pulaskis, rakes and chainsaws to clear the line of vegetation down to the mineral soil so that the fire will have nothing to burn when it gets to that point.

Controlled burn – A fire started naturally or by people within a contained area.

Council rake – A long-handled combination rake and cutting tool used in a mop-up.

Crawler tractor – A tracked vehicle (often equipped with a front-mounted blade and rear-attached fire plow) used to suppress wildfires.

**Crown fire** – A wildfire that spreads across the tops of trees or shrubs more or less independently of any fire on the ground.

**Defensible space** – An area where combustibles have been removed or modified, usually a width of 30 feet or more, between a home or other structure and a potential wildfire.

# GLOSSARY (CONTINUED)

**Drip torch** – A small fuel tank with a handle, nozzle and igniter used to drip a burning mixture of oil or diesel and gasoline to ignite a prescribed fire or a backfire.
Ecotone – The edge between two vegetation types.

**Ecosystem** – A community where living organisms and non-living components of the environment are acting as a unit.

**Environment** – The sum of all external conditions affecting the life, development and survival of an organism.

**Escape route** – A route away from hazardous areas in or around a fire; should be preplanned.

**Firebreak** – A natural or man-made barrier used to stop fires or keep them from spreading.

**Fire exclusion** – Total or near total elimination of fire from an ecosystem.

Fire flap – A fire tool made of a thick, flat piece of rubber on a long handle used to smother grass fires.

**Fire inclusion** - The intentional use of prescribed fire to manipulate an ecosystem.

Fire line – See "control line."

Fire plow – A heavy-duty plow usually pulled by a crawler tractor to make fire lines.

**Fire prevention** – Activities, including education, enforcement and administration directed at reducing the number of wildfires, the cost of suppression and the cost of related fire damages.

**Fire triangle** – A learning tool where the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) needed to catch on fire, burn and produce flame; removing any of the three factors causes the fire to go out.

**Firefighter** – A person who is trained to suppress structural and/or wildland fire.

Firewise construction – The use of materials and systems in the design and construction of a building to help keep fire from spreading within a building or to help keep fire from spreading from buildings to the urban wildland interface area, or vice versa.

Firewise landscaping – Managing the landscape so that flammable fuels are removed from around a structure to reduce exposure to radiant heat. The flammable fuels may be replaced with: green lawn; gardens; certain individually-spaced green, ornamental shrubs; individually spaced and pruned trees; or, decorative stone or other non-flammable or flame-resistant materials.

# GLOSSARY (CONTINUED)

Foam – A chemical fire-extinguishing mixture. It attaches to fuels, cooling and moistening them. It also keeps oxygen from the fuel; eliminating one of the items fire needs to burn.

**Forest** – An ecosystem of trees and undergrowth containing communities of trees and commonly including meadows and streams.

**Forest technician** – An employee of the Texas Forest Service whose duties include fire prevention and wildland firefighting.

**Fuel break** – A wide strip, or block of land where the vegetation has been permanently changed or reduced so that fires burning into it can be put out more easily.

Fuel hazard reduction – The treatment and/or removal of living and/or dead forest or wildland vegetation to reduce the threat of wildfire.

Fuel moisture content – The quantity of moisture in fuel given as a percentage of weight when thoroughly dried at 212 degrees Fahrenheit.

**Fuel** – All combustible material within the urban wildland interface or intermix, including vegetation and structures.

Hand crew – A group of firefighters organized and trained to clear brush, cut trees and make fire lines with hand tools.

**Ladder fuels** – Fuels (like shrubs and branches) that carry the fire from the ground to the tops of trees, the same way a person would climb a ladder.

**Mop-up** – Once a fire is controlled, mop-up begins. This is the process of making sure all remaining hot spots within the fire's perimeter are completely out.

**Natural barrier** – Any area that does not have flammable material (such as a stream) and can help keep wildfires from spreading.

**Overstory** – The portion of the trees in a forest that forms the upper or uppermost layer.

**Prescribed burning** – A management tool where fire is applied in a skillful manner to a definite place, for a specific purpose, under exacting weather conditions, to achieve manageable objectives. These objectives include reducing the hazardous build up of fire fuels, improving forage and habitat for wildlife and livestock, removing invasive vegetation, such as juniper, and improving the watershed.

Red flag warning – A term used by weather forecasters to alert firefighters and citizens to ongoing or approaching fire weather conditions.

# GLOSSARY (CONTINUED)

Relative humidity – The amount of moisture in the air as a percentage of the maximum the air will hold at a given temperature.

**Smoke** – (1) The visible products of combustion rising above fire. (2) Term used when reporting a fire or probable fire in its initial stages.

**Smokey Bear** – "Smokey" the fire prevention bear has been our nation's symbol for the prevention of wildfires for over 60 years. His main message is, "Remember . . . only you can prevent wildfires."

**Suppression (of fire)** – The act, or process of putting a fire out.

**Understory** – The layer in a forest below the overstory, formed by lower-growing vegetation under the tall trees, like shorter trees or bushes.

**Vegetation** – Plant life, or total plant cover of an area.

**Wildfire** – An unwanted or unplanned fire burning in forests or wildland areas that threatens to destroy life, property or natural resources.

**Wildland** – Land not used for agriculture (such as: grazing, row crops, commercial forestry), urban development, mining, parks or reserves.

**Urban Wildland Interface** – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

**Wildlife** – All non-domesticated animal life.

# PRETEST/POST-TEST

**NOTE: On the CD-ROM, these questions are presented in random order each time the test is accessed.**

1. All forests and grasslands need rain and sunshine to remain healthy. Some plant communities also need _____ to survive.
   a. Wind
   b. Snow
   c. Fire
   d. People

2. What ingredients are necessary to start a fire?
   a. Fuel, water and oxygen
   b. Heat and fuel
   c. Oxygen and fuel
   d. Fuel, heat and oxygen

3. Which of the following is an example of a "good" fire?
   a. A campfire
   b. The flame on a gas stove
   c. A prescribed fire
   d. All of these are good fires

4. Intentionally setting a wildfire, or any fire, is against the law. What do police call this crime?
   a. Arson
   b. Bad judgment
   c. Carelessness
   d. Improper fire setting

5. What is the name for the place where foresters and forest technicians go to work to make plans for managing forests?
   a. A District Office
   b. A work center
   c. A forest center
   d. A fire office

6. Foresters and technicians set, control and closely monitor_____ fires that imitate the effects of fire in nature.
   a. House
   b. Wild
   c. Prescribed
   d. Hot

7. What is the name for plant life that grows tall enough to carry fire from the ground to the tops of trees?
   a. Burning plants
   b. Good fuels
   c. Ladder fuels
   d. Burning fuels

8. Which of the following is an example of a bad fire?
   a. Arson
   b. A wildfire
   c. A house fire
   d. All of the above are bad fires

9. How do animals escape a fire in a well-maintained forest?
   a. They fly away
   b. They run away
   c. They burrow underground
   d. All of the above are ways animals can escape fire in the forest

10. If you live near a wooded area, which of the following can help reduce the risk of wildfire damage?
   a. Clear a 30-foot "defensible space" around your home
   b. Trim tree branches away from your roof and at least 6 to 10 feet from the ground
   c. Be sure your address is visible from the street so fire trucks can find your home easily
   d. All of the above can help reduce the risk of wildfire damage to your house

# FIRE WORD SEARCH

R I R D F Y R E K A A L E Z Y
S M O K E Y B E A R A L C S Y
E I B U Z O B L O A U U O G T
R R L A M R X D O P E V S S A
I R U R E A E Y D L L C Y R E
F S E S Y Y L I G R A X S E H
D Y E O S P V N C E R M T P R
L I O N C N I E S E N Z E A P
I O O T H R A Y T E C Y M I O
W D E L T K I B Y O D R R D L
V E L E I L I G H T N I N G G
Q S R V B N Y F E B R S R A X
T I O T L P A Q T F U E L F M
F R A N G E D R I N U R R J V

*See if you can find the following words in the word search puzzle above.*

Arson

Ecosystem

Fire

Fuel

Heat

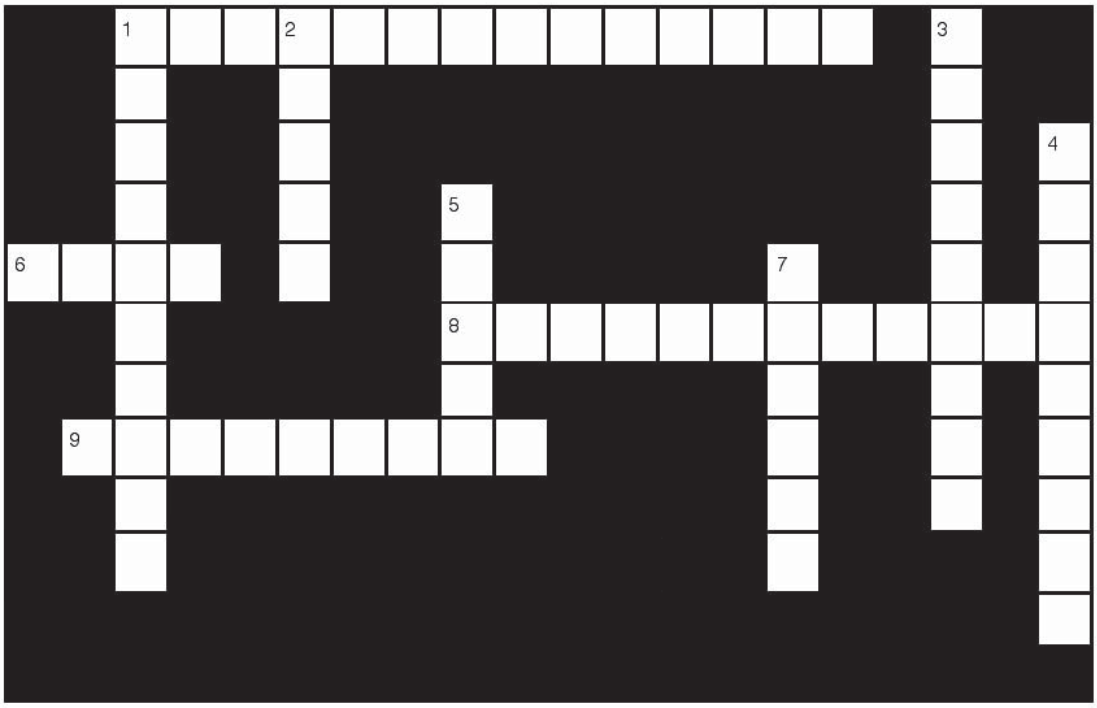
Lightning

Oxygen

Smokey Bear

Wildfire

# PRESCRIBED BURN CROSSWORD PUZZLE




**Across**

1. A _____ _____ is a fire set on purpose to imitate the effects of fire in nature.
6. Dead leaves, limbs and thick vegetation serve as _____ for fires.
8. One of several small fires that is purposely started with the wind and spreads out and joins together moving toward the backing fire is called a _____ _____ _____.
9. _____ starts 2-5% of the wildfires in the US.

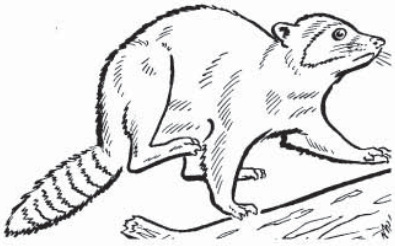
**Down**

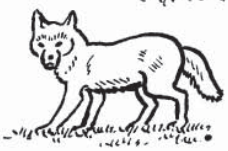
1. Things done to reduce the risk of wildfire are known as fire _____ techniques.
2. This is a by-product of fire that is a nuisance, and can, if not properly managed, cause visibility and other problems for people living nearby.
3. These are "bad" fires that are harmful to people, homes, forest resources, wildlife and ecosystems.
4. A natural, or man-made structure, like a creek or road that acts to prevent fire from spreading past a certain point.
5. _____ is the crime of maliciously setting a fire to damage or destroy property or buildings.
7. Thick vegetation that grows tall enough to carry fire from the ground to the crown of trees is called _____ fuel.

# WILDLIFE SCRAMBLE

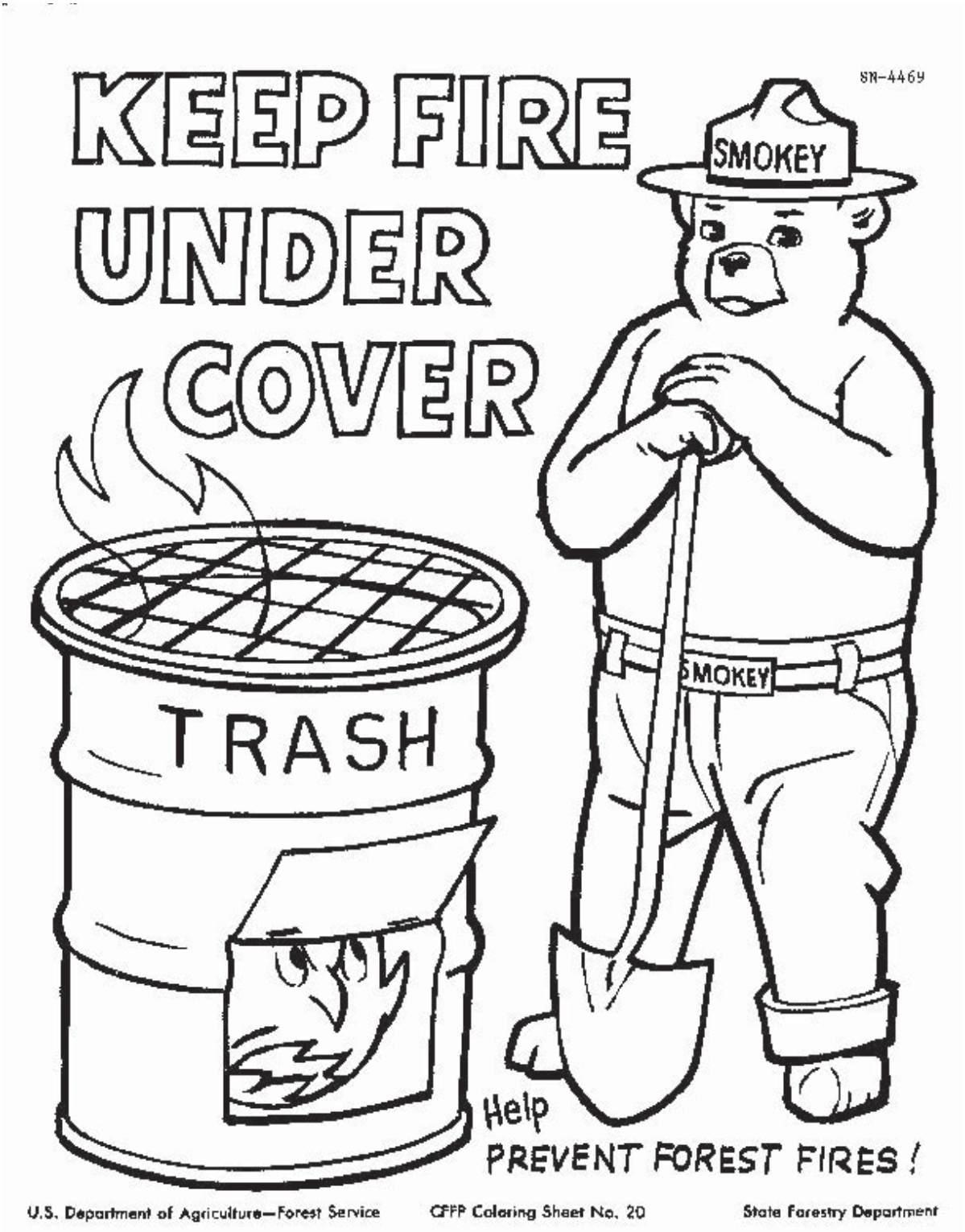
How do these animals escape a fire in the woods?
Unscramble their names and find out by putting the letters in the boxes in the blanks below.

1. B I T B R A ☐ ___ ___ ___ ___ ___
2. R E Y K T U ___ ☐ ___ ___ ___ ___
3. C R O O N A C ___ ___ ___ ___ ___ ___ ☐
4. O F X ☐ ___ ___
5. G A L E E ___ ___ ___ ☐ ___
6. U M O E S ___ ☐ ___ ___ ___
7. E D R E ___ ___ ___ ☐
8. K H I M C U P N ___ ☐ ___ ___ ___ ___ ___ ___ ___
9. R Q I U R L E S ___ ___ ___ ☐ ___ ___ ___ ___
10. K E C O O P E R D W ___ ___ ___ ☐ ___ ___ ___ ___ ___ ___ ___
11. R L U T T E ___ ___ ___ ___ ___ ☐
12. ___ ___ ___, ___ ___ Y ___ ___ ___ ___ ___ ___



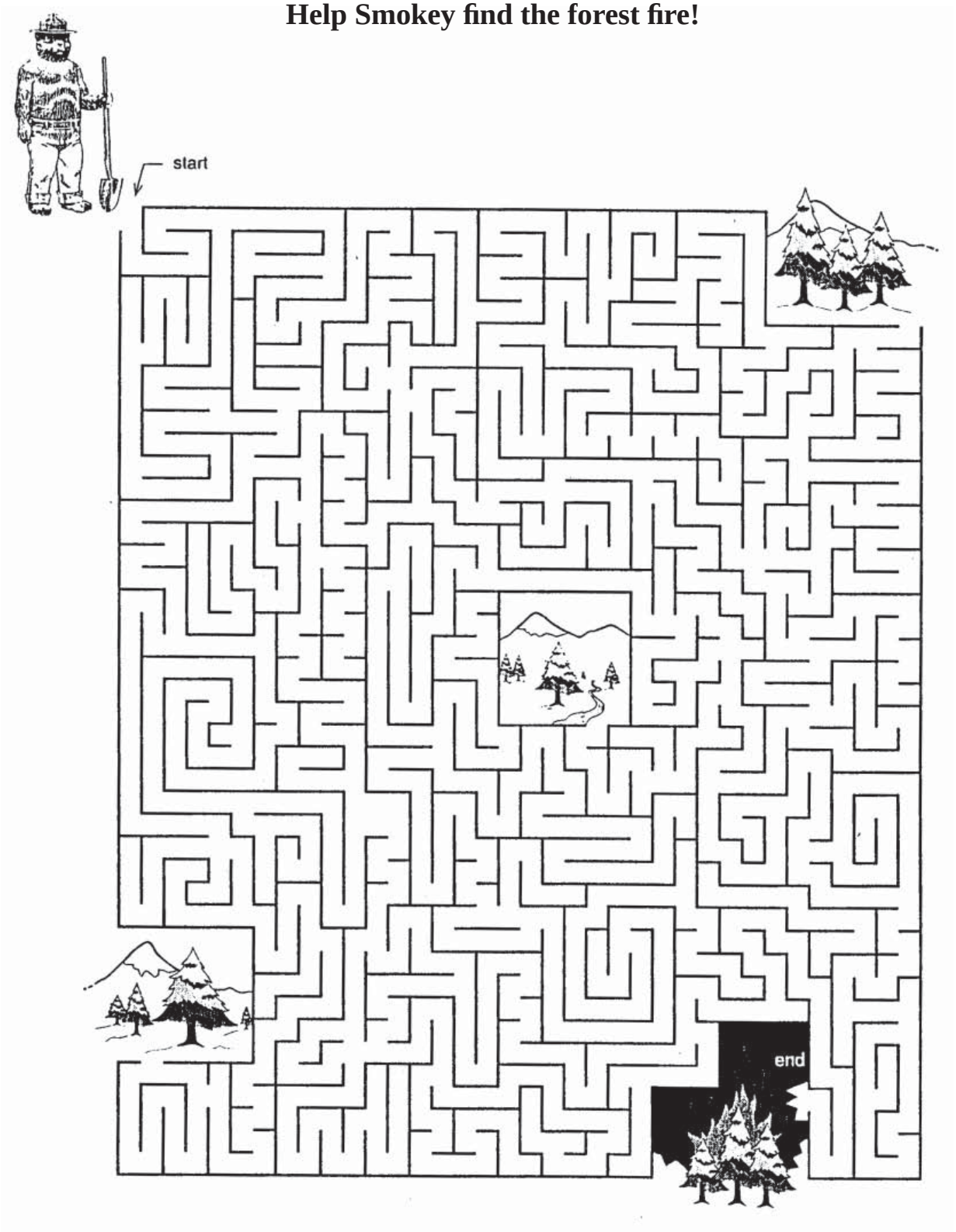


# SMOKEY'S COLORING PAGE

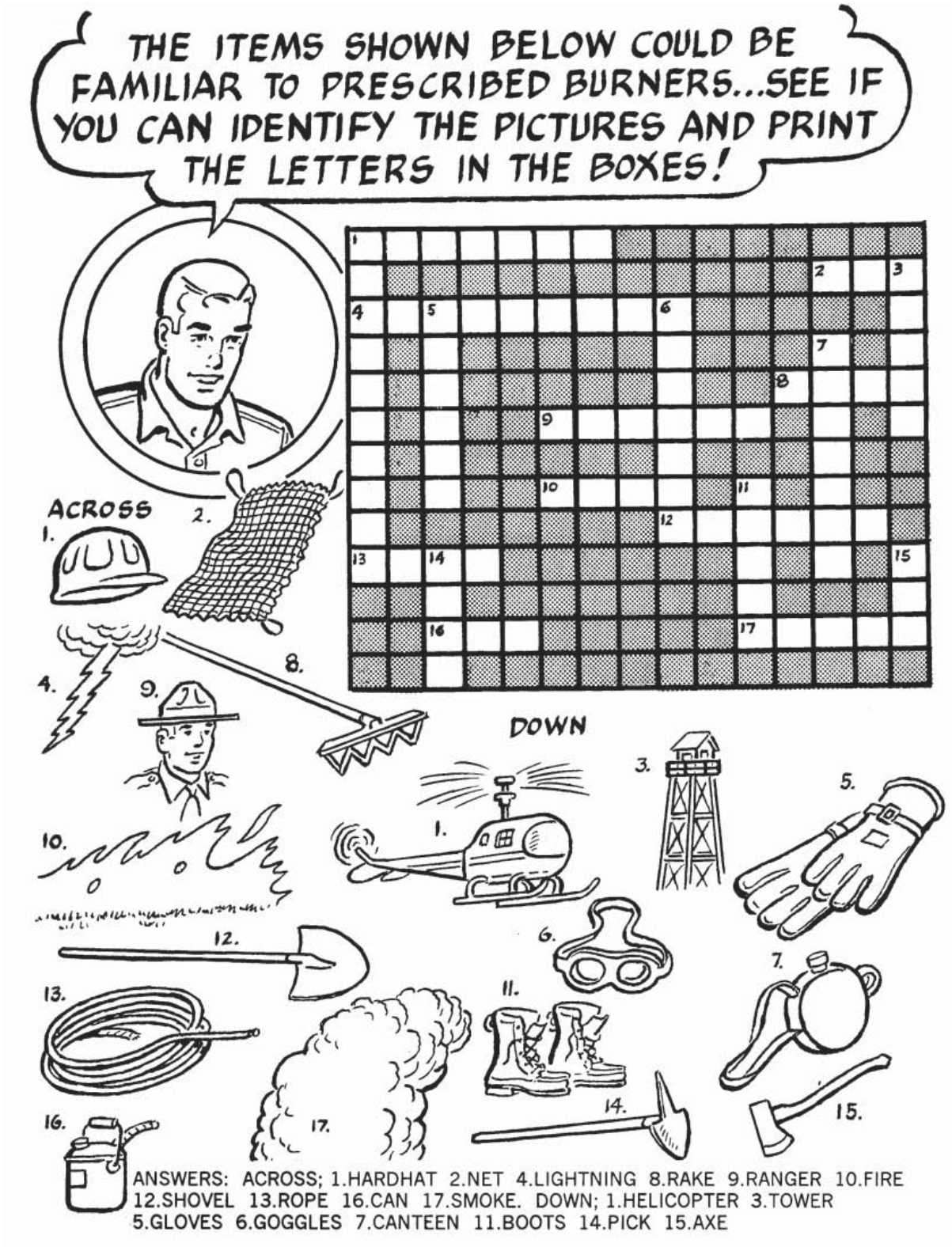


# SMOKEY'S MAZE

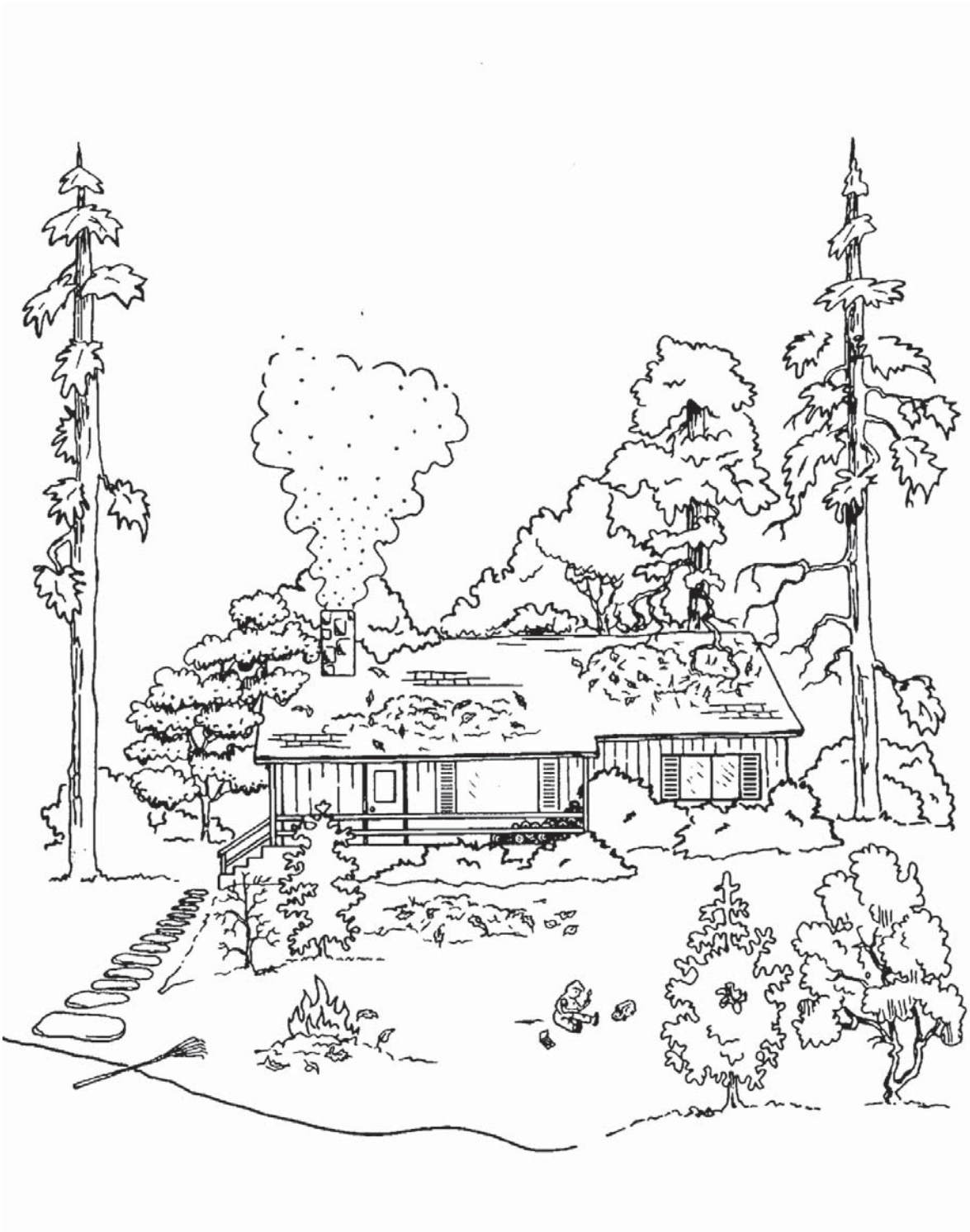
**Help Smokey find the forest fire!**



# FIRE FIGHTER'S CROSSWORD



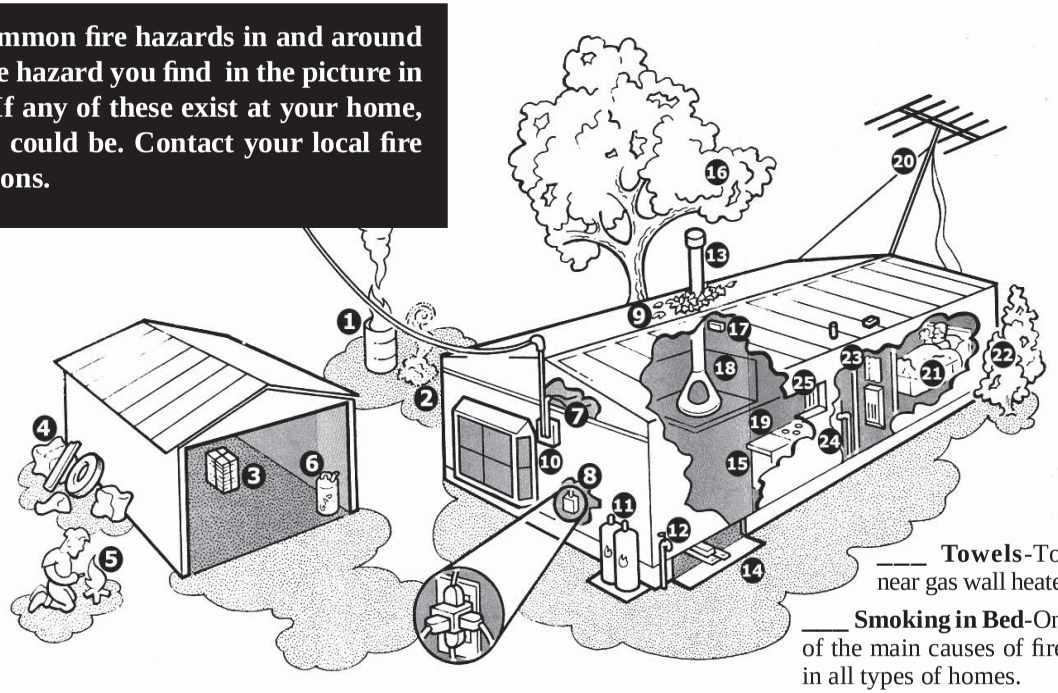
# HOME HAZARDS



**Can you find the fire hazards in this picture?**

# MOBILE HOME FIRE HAZARD NUMBER MATCH

**Pictured to the right are 25 of the most common fire hazards in and around mobile homes. Write the number of the fire hazard you find in the picture in the blank next to the correct description. If any of these exist at your home, you and your family aren't as safe as you could be. Contact your local fire prevention "partner" to answer any questions.**



___ **Vegetation** -Don't allow forest vegetation to grow within 30 feet of house.

___ **Trash on Roof** -Leaves, pine needles, etc., are dangerous fire hazards. Keep roof clear of them.

___ **Yard Rubbish** -Unsightly as well as a fire hazard. Do not allow paper, rags, weeds and other rubbish to accumulate.

___ **Gas water Heaters** -Play it safe by venting all gas heaters. Have yearly checks of hoses/connections. Extend all vent pipes above roof.

___ **Hot Ashes** -Never dump in exposed pile or into container holding household trash. Soak with water and bury.

___ **Chimney** -Cover with mesh screen spark arrester. Top of vent should be at least 3 feet above roof.

___ **Curtains** -Use fire-resistant materials, especially for curtains near a stove, heater or fireplace.

___ **Fireplace** -Use fire-resistant material on walls behind freestanding fireplaces or wood stoves.

___ **Stove** -Use fire-resistant materials on walls around stove.

___ **Fuel Tanks** -Too close to building. Remove to a distance where valves can be shut off if house is burning.

___ **Children & Fire**-Keep matches away from children. Teach them fire safety. You are responsible for fires they start.

___**Gasoline Storage**-Use a safety can. Keep in a well-ventilated place.

___**Smoke Detectors**-Place in appropriate places, including outside each sleeping area. Check monthly.

___ **Burning Barrel** -Legal only if trash pickup is NOT available weekly, and local laws do not prohibit it. Barrels should be covered with mesh screen spark arrester, and ground cleared to bare earth for 10 feet around barrel.

___ **House Wiring**-Use copper wiring; aluminum wiring can be very dangerous. If your home has aluminum wiring, have system checked annually by a qualified electrician.

___ **Skirting**-Should be maintained to prevent burnable debris from blowing under mobile home, and to prevent materials from being stored there.

___ **Overhanging Branches** -Don't allow branches to hang over a flue or chimney.

___ **Towels**-Too near gas wall heater.

___ **Smoking in Bed**-One of the main causes of fires in all types of homes.

___ **Outside Water Supply** -Too near house for use in case of fire. Have pipe stand away from building, with hose available.

___ **Fire Extinguishers** -Keep an all-purpose fire extinguisher handy near the stove. They are inexpensive, so have several around.

___ **Debris** -Newspapers, oily rags and rubbish can fuel a fire. Remove and dispose.

___ **Overloaded Circuits** -Use only one appliance at a time on a single outlet. Check electrical cords; replace if worn. Never run cords under rugs.

___ **TV Antenna** -Poorly installed. Keep guy wires tight. Use lightning arresters.

___ **Fuse Box** -Always use proper fuses/breakers. Never "bridge' fuses.

# ANSWERS TO ASSESSMENTS

**Student Assessment, What is Fire, Page 7**

1. Sunshine, rain, fire;
2. c;
3. a;
4. b;
5. a;
6. c;
7. a;
8. d;
9. b;
10. Answers will vary

**Student Assessment, Good Fires/Bad Fires, Page 10**

1. Warmth, Cooking and Light
2. escaped debris fires, equipment use, arson
3. c
4. Prescribed
5. Lightning
6. Good
7. Good
8. Bad
9. Bad
10. Answers will vary

**Student Assessment, District/ Regional Office, Page 12**

1. Forester, forest technician, or forestry profesional
2. Brush trucks, fire plows, truck transport, crawler tractor.
3. Burning authorizations
4. d
5. Answers will vary.

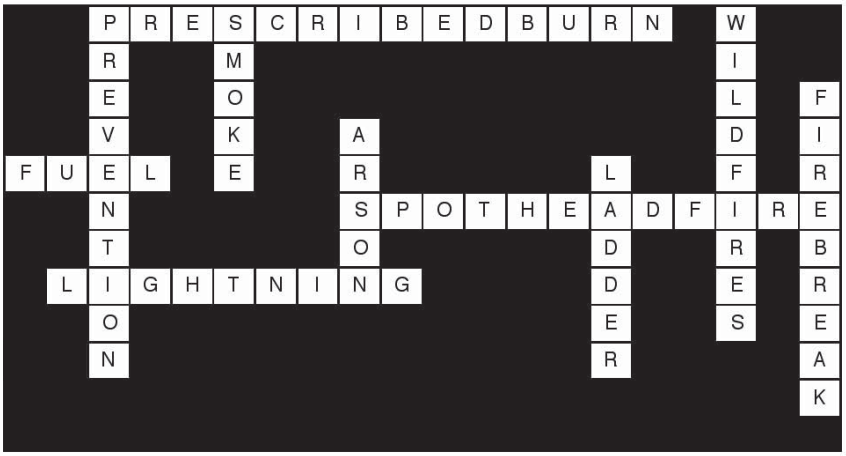
**Student Assessment, Patrol Aircraft, Page 18**

1. High fire danger
2. b
3. Ladder fuels
4. Running away, hiding
5. Fire towers, airplanes, citizen reports
6. Blackline
7. c
8. d
9. Answers will vary.
10. Answers will vary.

**Word Search, Page 24**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | I | R | D | F | Y | R | E | K | A | A | L | E | Z | Y |
| S | M | O | K | E | Y | B | E | A | R | A | L | C | S | Y |
| E | I | B | U | Z | O | B | L | O | A | U | U | O | G | T |
| R | R | L | A | M | R | X | D | O | P | E | V | S | S | A |
| I | R | U | R | E | A | E | Y | D | L | L | C | Y | R | E |
| F | S | E | S | Y | Y | L | I | G | R | A | X | S | E | H |
| D | Y | E | O | S | P | V | N | C | E | R | M | T | P | R |
| L | I | O | N | C | N | I | E | S | E | N | Z | E | A | P |
| I | O | O | T | H | R | A | Y | T | E | C | Y | M | I | O |
| W | D | E | L | T | K | I | B | Y | O | D | R | R | D | L |
| V | E | L | E | I | L | I | G | H | T | N | I | N | G | G |
| Q | S | R | V | B | N | Y | F | E | B | R | S | R | A | X |
| T | I | O | T | L | P | A | Q | T | F | U | E | L | F | M |
| F | R | A | N | G | E | D | R | I | N | U | R | R | J | V |

**Crossword, Page 25**




**Pretest/Post-test, Page 23**

1. c
2. d
3. d
4. a
5. a
6. c
7. c
8. d
9. a
10. d

**Wildlife Scramble, Page 26**

1. Rabbit
2. Turkey
3. Raccoon
4. Fox
5. Eagle
6. Mouse
7. Deer
8. Chipmunk
9. Squirrel
10. Woodpecker
11. Turtle
12. Run, fly or hide

**Fire Hazard Number Match, Page 31**

First column: 22,9,4,24,2,13,25,18,19,11,5
Second Column: 6,17,1,7,14,16
Third Column: 23,21,12,15,3,8,20,10

# CONTACTS

## Texas Forest Service

http://texasforestservice.tamu.edu
http://www.tamu.edu.ticc

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# Texas Wildfire Prevention Educational Standards

| | | What is Fire? | Good/Bad Fires | County Office | Patrol Aircraft |
|---|---|---|---|---|---|
| LANGUAGE ARTS | 4.1 | | | • | |
| | 4.1a-c | • | | | |
| | 4.2 | | | • | |
| | 4.3a | | | • | |
| | 4.3b | | | • | |
| | 4.3d | | | • | |
| | 4.3f | | | • | |
| | 4.8b | | • | | |
| | 4.8c | | • | | |
| | 4.13 | | | • | |
| | 4.15 | | | • | |
| | 4.15a | | | | • |
| | 4.15d | | | | • |
| | 4.15e | | | | • |
| | 4.15f | | | | • |
| | 4.15g | | | | • |
| | 4.19 | | | • | |
| | 4.21 | | | • | |
| | 5.1 | | | • | |
| | 5.1a-c | • | | | |
| | 5.2 | | | • | |
| | 5.4a-b | | | • | |
| | 5.4d | | | • | |
| | 5.4f | | | • | |
| | 5.10a | | • | | |
| | 5.10b | | • | | |
| | 5.10g | | • | | |
| | 5.10h | | • | | |
| | 5.10j | | • | | |
| | 5.10k | | • | | |
| | 5.10l | | • | | |
| | 5.11a-b | | | | • |
| | 5.13 | | • | • | |
| | 5.14a-d | | | | • |
| | 5.15 | | • | • | |
| | 5.19 | | • | • | |
| | 5.21 | | • | • | |
| | 6.1 | | | • | |
| | 6.1a-b | • | | | |
| | 6.2c | • | | | |
| | 6.3 | | | • | |
| | 6.5a | | | • | |
| | 6.5b | | | • | |
| | 6.5d | | | • | |

# Texas Wildfire Prevention Educational Standards

| | | What is Fire? | Good/Bad Fires | County Office | Patrol Aircraft |
|---|---|---|---|---|---|
| LANGUAGE ARTS *(continued)* | 6.5e | | | • | |
| | 6.5f | | | • | |
| | 6.8 | | • | | |
| | 6.10a | | • | • | |
| | 6.10b | | • | | |
| | 6.10j | | • | | |
| | 6.10l | | • | | |
| | 6.10m | | • | | |
| | 6.11 | | | • | |
| | 6.13 | | • | | |
| | 6.15 | | • | • | |
| | 6.15a | | | • | |
| | 6.15d | | | • | |
| | 6.15e | | | • | |
| | 6.15g | | | • | |
| | 6.18 | | | • | |
| | 6.19 | | • | | |
| | 6.20 | | | • | |
| MATH | 4.2d | • | | | |
| | 4.5a | • | | | |
| | 4.12 | | | | • |
| | 5.2b | • | | | |
| | 5.4a | • | | | |
| | 5.11a-b | | | | • |
| | 5.14d | | | | • |
| | 6.2b | • | | | |
| | 6.4a | • | | | |
| | 6.6a-d | | | | • |
| | 6.11a-d | | | | • |
| SCIENCE | 4.1a | • | | | |
| | 4.2 | • | | | |
| | 4.3a-b | | • | | |
| | 4.5 | | | | • |
| | 4.5a-b | • | • | | |
| | 4.8 | | | | • |
| | 4.10 | | | | • |
| | 5.1a | • | | | |
| | 5.2 | • | | | |
| | 5.3a-b | | • | | |
| | 5.5a-b | | • | | |
| | 5.5 | | | | • |
| | 5.6a | | | • | |
| | 5.8a | • | | | |
| | 5.9 | | | | • |

# Texas Wildfire Prevention Educational Standards

| | | What is Fire? | Good/Bad Fires | County Office | Patrol Aircraft |
|---|---|---|---|---|---|
| SCIENCE *(continued)* | 6.1a | • | | | |
| | 6.2 | • | | | |
| | 6.3a-b | | • | | |
| | 6.5a-b | | • | | |
| | 6.5 | | | | • |
| | 6.11 | | | | • |
| | 6.12b | | | | • |
| SOCIAL STUDIES | 4.7 | | | | • |
| | 4.9 | | | • | • |
| | 4.13 | | | • | • |
| | 4.14a | | | • | |
| | 4.21 | | | • | • |
| | 4.22 | | | | • |
| | 4.23 | | | • | • |
| | 4.24 | | | | • |
| | 5.9 | | | • | • |
| | 5.12 | | | • | • |
| | 5.14 | | | • | |
| | 5.24 | | | • | • |
| | 5.25 | | | | • |
| | 5.26 | | | • | • |
| | 5.27 | | | | • |
| | 6.7 | | | • | |
| | 6.9 | | | • | • |
| | 6.10 | | | | • |
| | 6.20 | | | | • |
| | 6.20a | | | • | |
| | 6.21 | | | • | • |
| | 6.22 | | | • | • |
| | 6.23 | | | | • |

# Dissemination Agreement

Date: _____

**Workshop Participant**

Name: _____

Address: _____

City, State: _____ Zip code: _____

Phone: ( ) –

E-mail: _____

School: _____

School phone: ( ) –

Project: *Wildfire Prevention*

In signing this agreement, the participant:

- Acknowledges the receipt of _____ *Wildfire Prevention* CD-ROMs,
- Will demo the *Wildfire Prevention* CD-ROM and show the recipient how to download the Teacher's Guide from the *Wildfire Prevention* web site,
- Will register the teachers receiving the *Wildfire Prevention* CD-ROM online at the *Wildfire Prevention* web site within 10 days of receiving CD-ROMs to share with peers, and
- Will return the *Wildfire Prevention* CD-ROMs at his/her expense to the state coordinator if not shared with other teachers.

The undersigned agrees to the terms of this agreement.

_____
Workshop Participant Signature

_____
Print Name

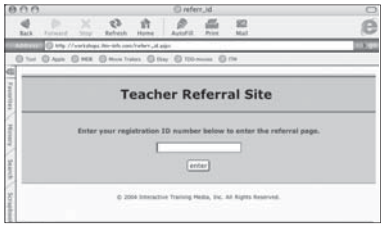
# Referral Registration

Interactive Training Media, Inc. requests your assistance in providing online referrals of all teachers with whom you have shared the *Wildfire Prevention* CD-ROMs. We ask that the referrals are completed within ten days of the teacher workshop.

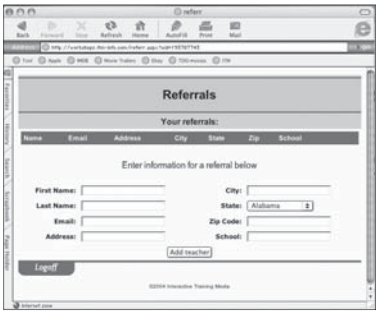
**Below is an easy, step-by-step guide for the online referral process.**

1. Access the *Wildfire Prevention* web site at: **www.itm-info.com/wildfire**


2. Click on the "Referral Form" button to proceed.




3. Fill in the USERID box with the number you received when you registered online.




4. Fill in the text boxes on the next screen with information of the TEACHERS WITH WHOM THE CD-ROMS WERE SHARED. DO NOT ENTER *YOUR* CONTACT INFORMATION.

5. Click the "Add Teacher" button to send the information.

6. Your name will be listed at the top of the form. The name of the teacher you referred will be listed below your name.

7. Repeat steps 4 and 5 to refer more teachers.

**FOR TECHNICAL SUPPORT CALL ITM TOLL FREE AT:** 1-866-463-6486.

To receive additional CD-ROMs, call_____ at _____.

# Action Plan

Steps I will take to implement the information I gained today:

# Workshop Evaluation

**What grade do you teach?** _____ **Date of workshop attended:** _____

**Location of workshop attended:** _____

| *1 = Disagree* *2 = Neutral* *3 = Agree* | | | |
|---|---|---|---|
| 1. The facilitator was knowledgeable about wildfire prevention. | 1 | 2 | 3 |
| 2. The facilitator (and guests) stimulated interest in wildfire prevention at the beginning and held it throughout the workshop. | 1 | 2 | 3 |
| 3. The facilitator modeled effective teaching practices such as stimulating discussion and participation, using cooperative learning groups, and integrating multimedia technology in the classroom. | 1 | 2 | 3 |
| 4. The facilitator modeled how to use the *Wildfire Prevention* materials (CD-ROM and Teacher's Guide) in the classroom. | 1 | 2 | 3 |
| 5. I intend to plan a unit using the *Wildfire Prevention* Teacher's Guide and CD-ROM and implement it in my classroom. | 1 | 2 | 3 |
| 6. The course materials contained valuable information about wildfire prevention. | 1 | 2 | 3 |
| 7. The workshop was well organized. | 1 | 2 | 3 |
| 8. The workshop activities were well paced. | 1 | 2 | 3 |
| 9. I feel my students would enjoy a unit on wildfire prevention using these materials. | 1 | 2 | 3 |
| 10. I enjoy this type of professional development and would be interested in similar workshops using these types of materials. | 1 | 2 | 3 |

11. How did you hear about this workshop? (*check one*)

❑ E-mail ❑ Flyer posted at school ❑ Principal ❑ Peer ❑ Workshop facilitator

❑ Other _____

12. What were some of the reasons you came to this workshop? (*continue on reverse if needed*)

13. Please list any other comments about the workshop, facilitator, facility, or materials. (*continue on reverse if needed*)

# Self-Assessment

Did your workshop participation contribute to your knowledge and understanding of wildfire prevention? If yes, how? If no, why?

Did your participation in this workshop influence the likelihood of using relevant current issues in your state to teach specific subject areas like math, science, and writing?

Did you encounter any obstacles as you taught the topics of wildfire prevention in your classroom? Please describe.

Has your new knowledge and professional development within this workshop led to increased student interest? Please describe.

Since you attended and implemented these topics within your classroom, has anyone noticed changes in your students' awareness? Please describe.

Is there more information that you would like to acquire for yourself, your students or your school site? If so, refer to your Teacher's Guide Contacts page.

# Individual Professional Development Plan

**Individual Professional Growth Plan**
**Modern forestry management practices as related to wildfire prevention**

**Teacher's Name** **School Name**

**Date** **Teacher's Signature**

**Other(s) Signature(s)**

**Area(s) of Major Emphasis: (*Check those that apply*)**

___1. Using technology in the classroom

___2. Using interesting and critical current local issues to teach specific subject areas

___3. Fire safety awareness

___4. Wildfire prevention awareness

Goal(s):
(Professional growth linked to student achievement)

Specific Objectives:
(Should be measurable, attainable, related to student, school, or teacher outcomes with an emphasis on student learning and teacher professional growth)

Strategies:

Resources:

Implementation Timeline:
(Related to specific goals above; ambitious, yet realistic completion dates for each objective)

Evaluation/Documentation of goal(s) and objective(s) accomplishment:

Further areas for professional growth, in teaching, using current critical issues.

# ACTIVITIES

## PRE-TEST/POST-TEST

1. List the three major causes of wildfire.

2. What is the natural role of fire in our wildland ecosystems?

3. What is the urban wildland interface and how is it affected by wildfire?

4. The act of deliberately setting a fire meant to harm property is called _____.

5. A fire that has been planned and deliberately set by foresters in order to reduce hazardous fuel build-up

   is called a _____ fire.

6. What would you call understory plants that grow tall enough to carry fire from the ground to the top of the trees?

7. A fire that spreads via the tops of adjacent trees is called a _____ fire.

8. List 2 differences between a structural firefighter and a wildland firefighter.

9. Explain the home ignition zone and the zone of defensible space.

10. List 5 additional things (other than reducing hazardous vegetation in the home ignition zone and the zone of defensible space) a homeowner can do to reduce the risk of wildfire damage in the event a wildfire occurs.

# ACTIVITIES

## K W L CHART*

| K | W | L |
|---|---|---|
| | | |

* Ogle, D.M. (1986). K-W-L: A teaching model that develops active reading of expository text. Reading Teacher, 39, 564-570.

# ACTIVITIES

## WORD WALL

# ACTIVITIES

## VIDEO ACTIVITY SHEET

1. What is the urban wildland interface and what are the fire issues concerning areas in the urban wildland interface?

2. What is the natural role of fire in our ecosystems?

3. What three components does fire need to exist?

4. Name some factors that affect the behavior of fire?

5. What is the most effective and economical means of reducing fuel in the wildland areas that surround communities in the urban wildland interface?

6. What are the main reasons homes burn during wildfires?

7. What can homeowners do to reduce the risk of damage to wildfire?

8. What is the zone of defensible space?

9. Protection of homes and businesses from wildfire in the urban wildland interface involves whom?

What additional things can communities in the urban wildland interface do to reduce the risk of wildfire damage?

# ACTIVITIES

## COMPARE AND CONTRAST FIREFIGHTERS

| | Structural Firefighter | vs. | Wildland Firefighter |
|---|---|---|---|
| CLOTHING | | | |
| TOOLS | | | |
| FIRE-FIGHTING METHODS | | | |
| TRAINING | | | |

# ACTIVITIES

## COMPARE AND CONTRAST FIREFIGHTERS

| | Structural Firefighter | vs. | Wildland Firefighter |
|---|---|---|---|
| CLOTHING | Nomex, heavily padded, turnout gear<br>Helmet<br>Respirator<br>Heavy, steel-toe boots<br>Heavy gloves | | Nomex, lightweight clothing<br>Hard hat<br>Cloth face mask/shroud<br>Lightweight leather boots<br>Lightweight leather gloves |
| TOOLS | Fire truck<br>Hoses<br>Axe | | Bulldozer<br>Pulaski<br>GPS system<br>Drip torch<br>Fire swatter<br>Weather gauges<br>Brush hook |
| FIRE-FIGHTING METHODS | Focused on structures<br>Uses extreme amounts of water<br>Additional water from hydrants, if available | | Focused on forests/structures<br>Little or no water<br>Uses tools to remove fuel |
| TRAINING | College degree not required<br>Structural firefighting training<br>Continuous training | | College degree not required<br>Wildland firefighting training<br>Continuous training |

# ACTIVITIES

## LAB ACTIVITY SHEET

Note: This activity can be done in a computer lab individually, in pairs, in groups of three, or as a whole group activity if a lab is not available.

- **INSTALL THE CD-ROM.**
  Question: What 2 programs must you install on your computer in order for this CD-ROM to run?

- **LOG-IN USING THE LOG-IN SCREEN.**
  Question: How old did you say you were on the log-in page?

- **COMPLETE THE PRE-TEST.**
  Question: What was your score?

- **CLICK ON INTRO LESSON 1 FROM THE MAIN MENU.**
  Question: The air we breathe is about ____% oxygen. Fire needs the surrounding air to contain ____% oxygen to burn. What happens to the oxygen when we smother a fire with dirt?

- **CLICK ON INTRO LESSON 2 AND VIEW THE GOOD FIRES AND BAD FIRES VIDEOS.**
  Question: Fill in the chart below.

| Good Fires - Examples | Bad Fire Example |
|---|---|
| | |
| | |
| | |

- **CLICK ON INTRO LESSON 3 AND VIEW THE VIDEO.**
  Question: What photos or videos did you see in this video? How could you use this section as a start of a lesson on forestry careers?

- **GO TO THE FIRE TOWER/PATROL AIRCRAFT.**
  Question: Did your CD-ROM have a fire tower or a patrol aircraft? How many clickable items are in the forest from the patrol aircraft?

- **GO TO THE SITE MAP.**
  Question: How many places can you go to from the site map?

# ACTIVITIES

## LAB ACTIVITY SHEET *(CONTINUED)*

- **FROM THE SITE MAP CLICK ON THE HOME SAFETY ACTIVITY.**
  Question: What are six things you can do to protect your home from wildfire risk?

  1. _____
  2. _____
  3. _____
  4. _____
  5. _____
  6. _____

  Question: How could you incorporate an art activity into this content?

- **CLICK ON THE GLOSSARY**
  Question: What are ladder fuels? How can ladder fuels be especially dangerous to homes near wildlands or forests? What other activity could you do in your classroom using one of these vocabulary words?

- **IF YOU HAVE AN INTERNET CONNECTION, CLICK ON ONLINE REFERENCES.**

  **Go to the FAQ section.**
  Question: What are the three leading causes of wildfire in your state?

  **Go to the Links section. Click on the national weather service link.**
  Question: What is the weather forecast for your city tonight? Do you know how weather affects fire conditions?

  **Click on the link to current wildland fire information.**
  Question: In what state was the largest wildfire last year? In what state was the most expensive wildfire?

  **Click on the Smokey Bear site, go to Smokeykids, and then click on Bear Facts.**
  Question: How could you make this into a writing activity for your students?

  **Go to the Resources section**
  Question: What are some resources you found there that you can use in your classroom?

# ACTIVITIES

## LAB ACTIVITY SHEET *(CONTINUED)*

- **GO BACK TO THE FIRE TOWER/PATROL AIRCRAFT. FIND THE SECTION ABOUT WILDFIRE VIEW THE VIDEO.**
  Question: What weather conditions make periods of high fire danger?

- **GO BACK TO THE FIRE TOWER/PATROL AIRCRAFT. FIND THE SECTION ABOUT PRESCRIBED BURNING AND VIEW THE VIDEO.**
  Question: How is prescribed fire sometimes used to reduce fuels? How is fuel reduction important to wildfire prevention?

- **GO BACK TO THE FIRE TOWER/PATROL AIRCRAFT. FIND THE SECTION ABOUT CAMPFIRE SAFETY AND LISTEN TO THE ANIMATION.**
  Question: What are 5 things you can do to keep a good campfire from becoming a bad fire?

  1. _____

  2. _____

  3. _____

  4. _____

  5. _____

- **TAKE THE POST TEST.**
  Question: What was your score?

- **FIND THE WPSCORES TEXT FILE ON THE DESKTOP. OPEN IT UP.**
  Question: What is the time the test scores were recorded?

- **NOW MOVE THIS FILE INTO THE RECYCLE BIN.**

- **UNINSTALL THE PROGRAM USING THE UNINSTALL DISC OPTION IN THE START MENU GROUP FOR THE PROGRAM.**