

KENTUCKY wildfire PREVENTION



WILDFIRE PREVENTION TEACHER'S GUIDE

Kentucky Wildfire Prevention . . .

This Teacher's Guide, along with the *Wildfire Prevention* CD-ROM, is designed to help you explore with your students the role of fire in Kentucky's forests. It addresses not only the problem of wildland arson and debris fires, but also highlights the benefits of planned prescribed fire. We hope you find these tools useful as you learn how fire in Kentucky is usually destructive, but can be beneficial if used properly. We are confident that you and your students will enjoy the challenges and opportunities of this CD-ROM.

Leah W. MacSwords, Director
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**** Register for a Wildfire Prevention Workshop at:
www.itm-info.com/wildfire**

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INTRODUCTION

PURPOSE

The *Wildfire Prevention* CD-ROM, along with other software developed for forestry education, *Forests Forever*, *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:

- Show students that fire is vital to the health of pine ecosystems;
- Teach how prescribed fire benefits wildlife;
- Show how prescribed fire prevents disastrous wildfires;
- Promote the importance of wildfire prevention;
- 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 the content 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 *Wildfire Prevention* CD-ROM is primarily designed for use in 4th- 6th 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 the CD-ROM program.

INTRODUCTION (CONTINUED)

INTRODUCTION VIDEO

The CD-ROM begins with a video that describes the benefits of fire and how important fire is to forests. It explains that forests 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. 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.

USER-TIPS

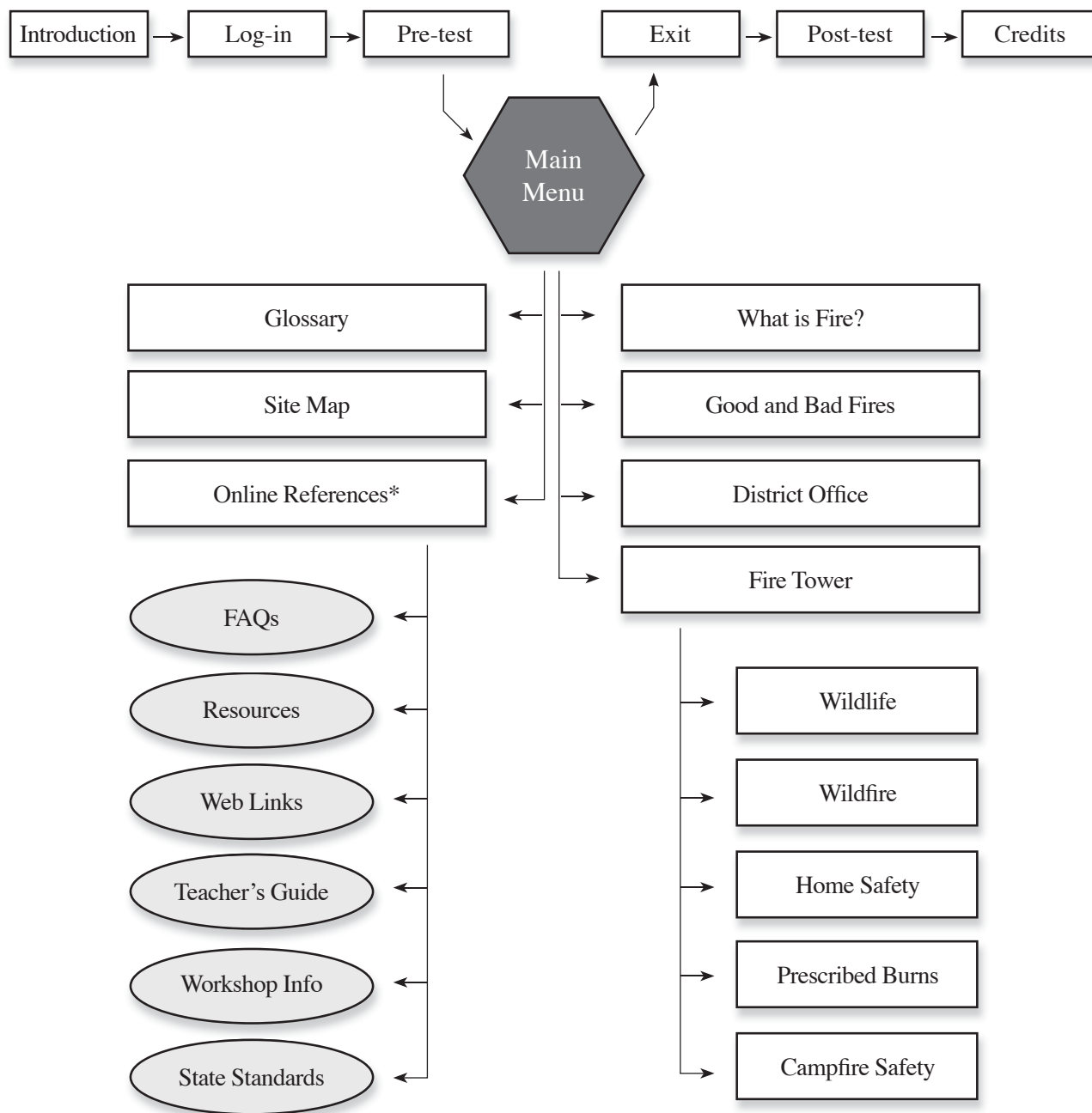
COMPUTER MONITOR RESOLUTION- The Wildfire Prevention CD-ROM was developed at 640 x 480 monitor resolution. If the picture does not fill the screen, you will have to adjust your monitor resolution to this setting. Please consult your monitor guidelines for instructions. If your screen appears dark, you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



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.

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 12.7 million acres of the state 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 1,500 wildfires in Kentucky 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 Division of Forestry.

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. 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.

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.

Levels

Grades 4-6

Subjects

Science, Writing, Reading, 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 for thousands of years.

Skills

Observing, Relationships, Patterns, Organizing Information and Analyzing

KY Educational Standards

Science

SC-E-1.2.3

SC-E-3.3.2

SC-E-3.3.3

SC-M-1.1.1

SC-M-1.3.2

SC-M-1.3.3

SC-M-3.5.4

Writing

WR-E-1

WR-E-1.4

WR-M-1

WR-M-1.4

Reading

RD-E-2.0.6

RD-M-2.0.11

RD-M-3.0.17

Math

MA-E-1.3.1

MA-M-1.2.3

5. **Math** 16 million acres of a state's 35 million total acres are forested. What percentage of the land base is covered with forests? (45.7%) If 2% of the 1,000 yearly wildfires in the US are started by lightning, how many fires are not the result of lightning annually? (980)

STUDENT ASSESSMENT - WHAT IS FIRE?

Name: _____

1. List three things that a forest needs 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 Kentucky, there are about _____ wildfires each year.

a) 500 b) 1,000 c) 1,500 d) 10,000

4. What percent of wildfires 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.

BAD FIRES

A fire that burns out of control and destroys anything in its path is an example of a bad fire. Wildfires in the forest fall in this category. Kentucky has about 1,500 wildfires that burn many thousands of acres annually.

In Kentucky there are three main causes of wildfires. These are arson, debris burning, and equipment use. Arson is the #1 cause of wildfires in Kentucky.

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 second leading cause of wildfire in Kentucky is debris burning. 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.

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 areas after lightning storms and during periods of high fire danger are some of the things forest ranger technicians can do to control the damage caused by lightning strikes.

PRESCRIBED FIRES

The importance of prescribed fires, introduced in this section is discussed in detail in the "Fire Tower" section of the CD-ROM.

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). 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, Writing, Reading, Math

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.
- Importance of prescribed fire in preventing wildfires.

Skills

Observing, Relationships, Patterns, and Analyzing

KY Educational Standards

Science

SC-E-2.1.2
SC-E-2.3.1
SC-E-3.3.2
SC-E-3.3.3
SC-M-2.2.1
SC-M-3.4.1

Writing

WR-E-1
WR-E-1.4
WR-M-1
WR-M-1.4

Reading

RD-E-2.0.6
RD-E-2.0.9
RD-E-2.0.10
RD-E-4.0.6
RD-M-2.0.11
RD-M-4.0.11
RD-E-3.0.6
RD-E-3.0.7
RD-E-3.0.8
RD-E-3.0.11
RD-E-3.0.12-15
RD-E-3.0.17

Math

MA-E-3.1.2
MA-M-3.2.5

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 Kentucky: _____,
_____ and _____.
3. _____ is the #1 cause of wildfires in the state.
a) arson b) lightning c) people burning debris d) campfires
4. Unlike with wildfires, forest ranger technicians 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 forest ranger technician would intentionally start a fire in the forest.

DISTRICT OFFICE

In this section students will learn about:

- Work done by the Division of Forestry.
- The purpose of the District office.

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

Almost every county in the state has a District office where forest ranger 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 offices maintain all of the necessary equipment for forest ranger 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 ranger technicians are dispatched to (sent to) wildfires when fires are reported by:

- Fire tower lookouts
- Patrol airplanes
- Citizens who call 911

District offices also issue outdoor burning authorizations to landowners who wish to prescribe burn their forest or burn piled trees from land clearing. Homeowners may burn yard leaves and branches (debris) without requesting authorization if a noncombustible container is used, covered by a metal screen or grill.

At these 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. During periods of high fire danger, no

outdoor burning authorizations will be issued. When weather conditions are severe, a Red Flag Warning is issued 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 Division of Forestry 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

Levels

Grades 4-6

Subjects

Science, Social Studies, Reading, Writing

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

KY Educational Standards

<u>Science</u>	<u>Social Studies</u>
SC-E-2.1.2	SS-E-1.3.3
SC-E-2.3.2	SS-E-3.2.3
SC-E-3.3.3	SS-E-3.4.3
	SS-M-1.3.2
	SS-M-4.1.2
<u>Reading</u>	<u>Writing</u>
RD-E-2.0.6	WR-E-1
RD-E-2.0.10	WR-E-1.4
RD-E-4.0.6	WR-M-1
RD-E-4.0.9	WR-M-1.4
RD-M-2.0.11	
RD-M-2.0.14	
RD-M-4.0.11	
RD-M-4.0.14	

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

STUDENT ASSESSMENT - DISTRICT OFFICE

Name: _____

1. A _____ works at the District office and is responsible for planning when and how to conduct prescribed burns.
2. List two types of equipment kept at District offices: _____
and _____.
3. In the state, landowners are issued burning _____ by the Division of Forestry 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?

FIRE TOWER

In this section students will learn about:

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

This virtual fire tower gives students a forest ranger's view of the woods as he works to protect the forest from bad fires. There are four windows from which to watch for fires. Each window has different scenes relating to plants and animals, prescribed fire, wildfire and fire safety. Clicking on these scenes initiates a video clip that explains the topic covered and expands on the lesson provided.

In the fire tower, there is also a radio and an online reference list. Clicking on the radio gives instructions on how to explore the scenes in the fire tower windows. The reference list gives students access to a wealth of supplemental information contained on the CD-ROM.

Window I

Wildlife

Our beautiful forests support a great variety 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.

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. 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

Levels

Grades 4-6

Subjects

Science, Writing, 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 important uses, poses many dangers that we must prepare for.
- Certain steps must be taken to protect our life and property.

Skills

Observing, Classifying and Categorizing, Evaluating

KY Educational Standards

Science

SC-E-3.1.2
SC-E-3.3.2
SC-E-3.3.3
SC-M-3.2.1
SC-M-3.4.1
SC-M-3.5(.1-.4)

Writing

WR-E-1
WR-E-1.3
WR-M-1
WR-M-1.3

Social Studies

SS-E-1.1.3
SS-M-1.1.3
SS-E-2.4.2
SS-M-2.4.2
SS-E-4.2(.1-.2)
SS-M-4.2(.1-.3)
SS-E-4.4(.1-.4)
SS-M-4.4(.1-.4)

Math

MA-E-2.12
MA-E-4.12
MA-M-2.2.2
MA-M-2.2.5

FIRE TOWER (CONTINUED)

this area.

Prescribed fire may also be used for other reasons. The control of certain insects, and diseases of plants can be accomplished with fire; when land-owners 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 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 forest ranger technicians 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 that forest ranger technicians must do is establish a **fire-break**. 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. Forest ranger technicians 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. Forest ranger technicians are constantly on guard to make sure the fire stays under control and in the planned areas.

Window II

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 a lookout in a fire tower, an airplane patrolling for wildfires or a citizen, forest ranger 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 make 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 fires, or prescribed burns, imitate the effects of fire in nature. *True*
2. Prescribed fires reduce the amount of fuel available for a wildfire. *True*
3. Prescribed fires are good for the ecosystem. *True*

Window III

Campfire Safety

Campfire 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 campfire 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 campfire unattended.

- Put the campfire out with water and dirt and stir the remains. Make sure all the burned material has been extinguished and cooled.

Window IV

Home Fire Safety

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

A home's proximity to the forest is the most important factor in predicting the danger it faces from wildfire. The CD-ROM illustrates a wildland/urban interface home that has many fire hazards. Students are to make the house "firewise" clicking on and removing the hazards they detect. On the following page 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.

FIRE TOWER (CONTINUED)

- 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.
- Observe proper procedures and local laws for burning debris.
- Work with forest ranger technicians 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.

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.)

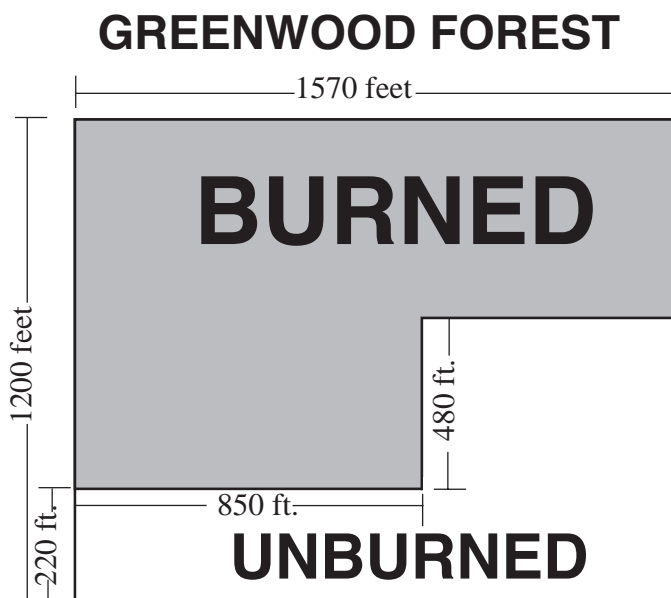
Answers:

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 43.25 acres
---------------	--------------------------------------

Burned area	1,193,000 square feet 27.39 acres
-------------	--------------------------------------

Unburned area	691,000 square feet 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?

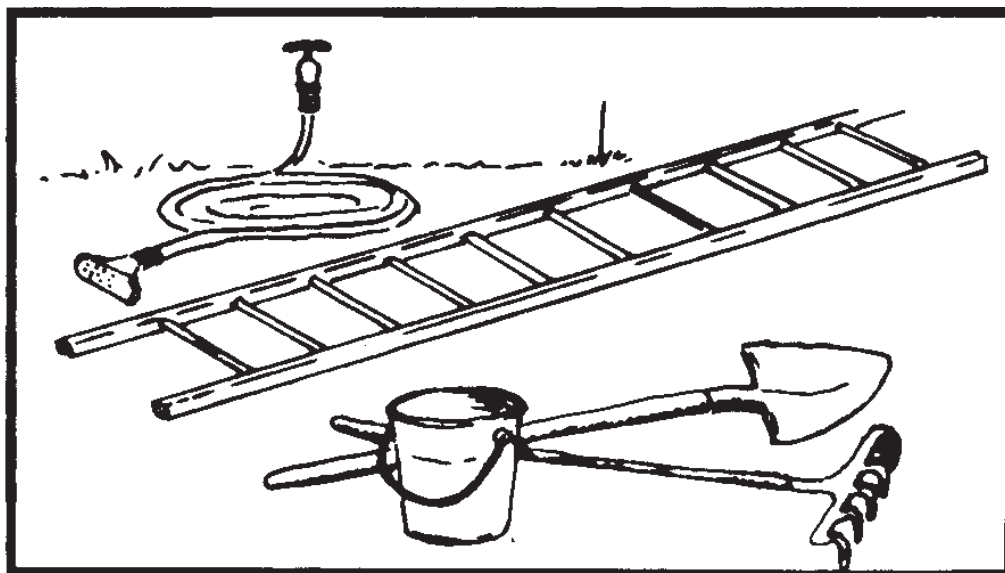
☐ ☐



FIRE SAFETY CHECK LIST (OUTSIDE)

Outside your house, do you . . .

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



STUDENT ASSESSMENT - FIRE TOWER

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 Division of Forestry:
_____, _____, _____.
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, or spread to, 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.

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, in the form in which it is used and under the conditions anticipated, will 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.

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, usually a width of 30 feet or more, between a home or other structure and a potential wildfire where the combustibles have been removed or modified.

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.

GLOSSARY (CONTINUED)

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 dangerous areas or a fire; should be preplanned.

Fire break – 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 wildland/urban 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.

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 with dense or not-so-dense tree cover; often containing separate stands of trees, and commonly including meadows and streams.

GLOSSARY (CONTINUED)

Forest ranger technician – An employee of the Division of Forestry whose duties include fire prevention and wildland firefighting.

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

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.

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 forest management tool where fire is applied in a skillful manner to forest fuels, in a definite place, for a specific purpose, under exacting weather conditions, to achieve manageable objectives, such as to improve forage and habitat for wildlife and livestock, to improve watershed, or to reduce hazardous build up of fire fuels.

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

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.

GLOSSARY (CONTINUED)

Smokey Bear – “Smokey” the fire prevention bear has been our nation’s symbol for the prevention of wildfires for over 50 years. His main message has always been, “Remember . . . only you can prevent wildfires.”

Suppression (of fire) – The act, or process of putting a fire out. This is the most aggressive fire protection strategy, which leads to the total extinguishing of a fire.

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.

Wildland-Urban 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

1. Pine forests can benefit from:
 - a. Rain
 - b. Sunshine
 - c. Fire
 - d. All of the above
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 rangers go to work to make plans for managing forests?
 - a. A fire station
 - b. A district office
 - c. A forestry station
 - d. A fire office
6. Forest ranger 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. Which type of fire can animals escape more easily?
 - a. A prescribed fire
 - b. A wildfire started by lightning
 - c. Arson
 - d. A wildfire started by a careless person
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 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

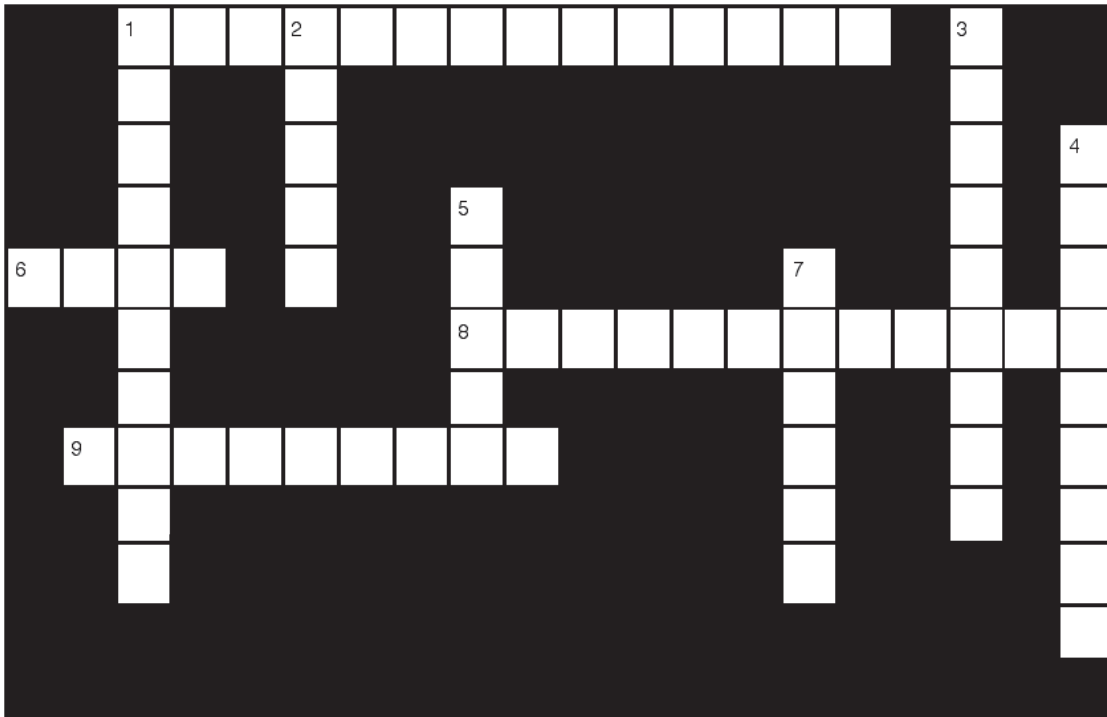
Lightning

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. BITBRA _ _ _ _ _

2. REYKTU _ _ _ _ _

3. CROONAC _ _ _ _ _

4. OFX _ _

5. GALEE _ _ _ _

6. UMOES _ _ _ _

7. EDRE _ _ _

8. KHIMCUPN _ _ _ _ _

9. RQIURLES _ _ _ _ _ _ _ _

10. KECOOPERDW _ _ _ _ _ _ _ _ _

11. RLUTTE _ _ _ _ _

12. _ _ _ _ , _ _ _ Y _ _ _ _ _



SMOKEY'S COLORING PAGE



U.S. Department of Agriculture—Forest Service

CFFP Coloring Sheet No. 20

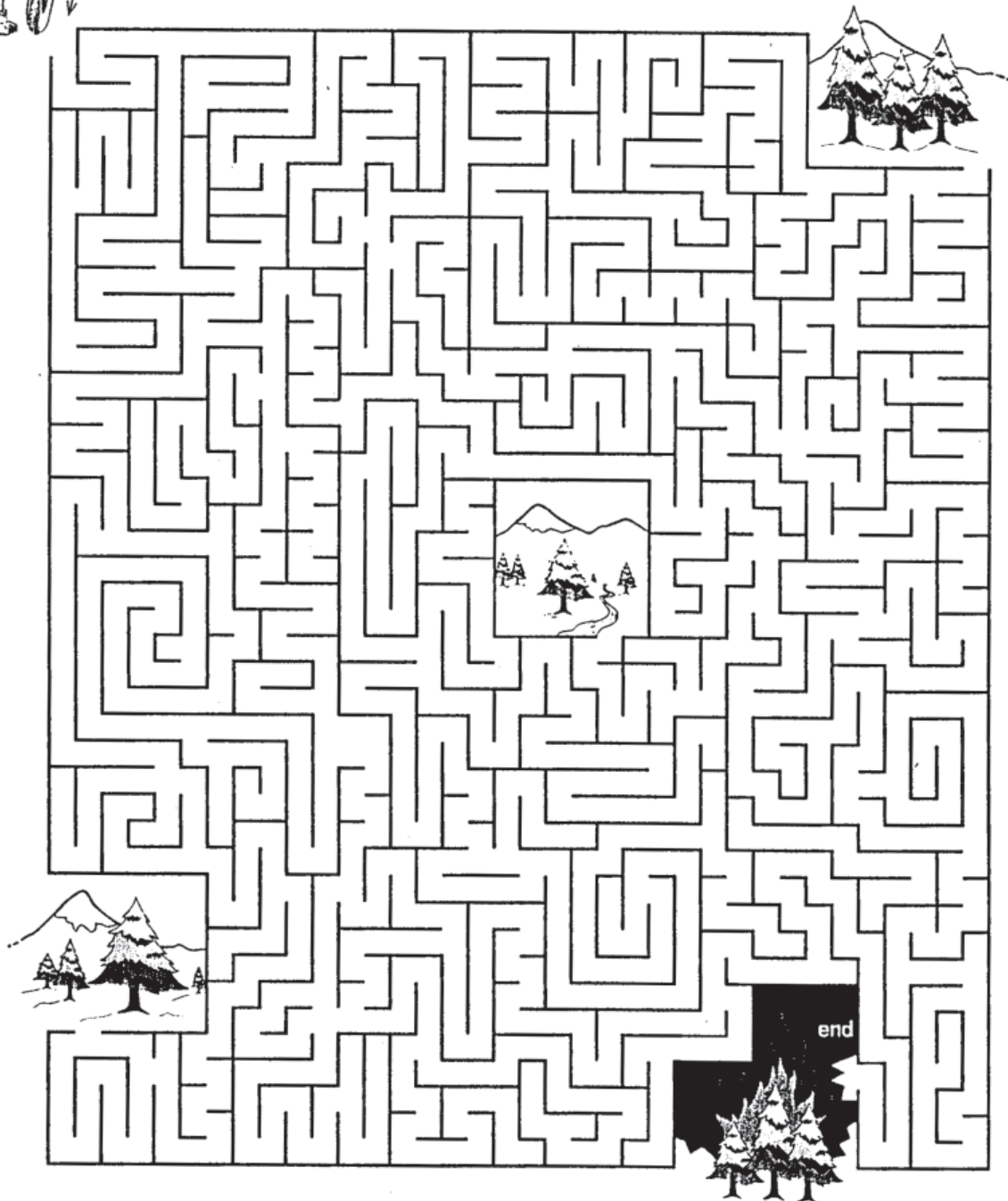
State Forestry Department

SMOKEY'S MAZE

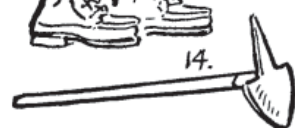
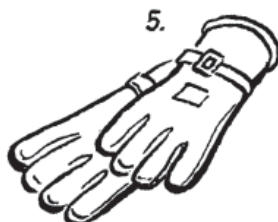
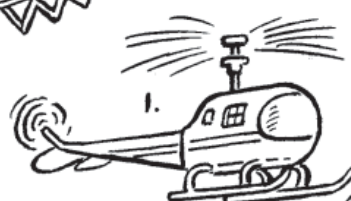
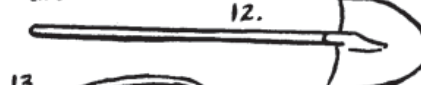
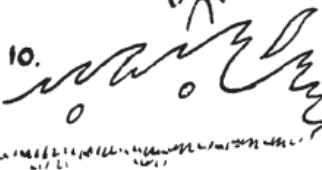
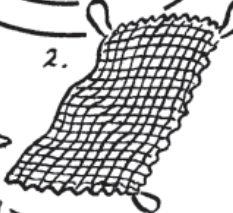
Help Smokey find the forest fire!



start



FIRE FIGHTER'S CROSSWORD



ANSWERS: ACROSS; 1.HARDHAT 2.NET 4.LIGHTNING 8.RAKE 9.RANGER 10.FIRE
12.SHOVEL 13.ROPE 16.CAN 17.SMOKE. DOWN; 1.HELICOPTER 3.TOWER
5.GLOVES 6.GOGGLES 7.CANTEEN 11.BOOTS 14.PICK 15.AXE

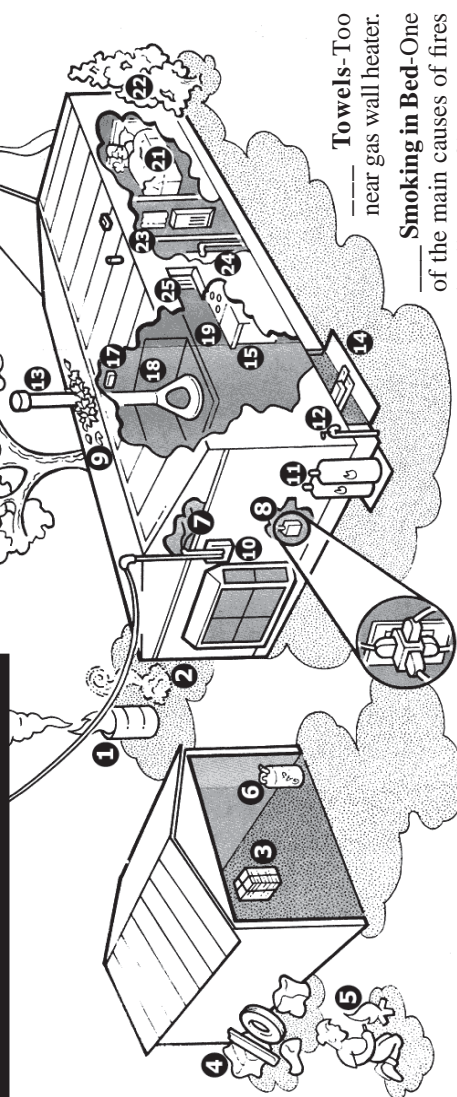
HOME HAZARDS



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** -Unightly 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.

___ **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.

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

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

ANSWERS TO ASSESSMENTS

Student Assessment, What is Fire, Page 7

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

Student Assessment, Good Fires/Bad Fires, Page 9

1. Warmth, Cooking and Light
2. Arson, debris burning, equipment use
3. a
4. Prescribed
5. Lightning
6. Good
7. Good
8. Bad
9. Bad
10. Answers will vary

Student Assessment, Forestry Work Center, Page 11

1. Forest ranger technician
2. Brush trucks, fire plows, truck transport, crawler tractor.
3. Burning authorizations
4. d
5. Answers will vary.

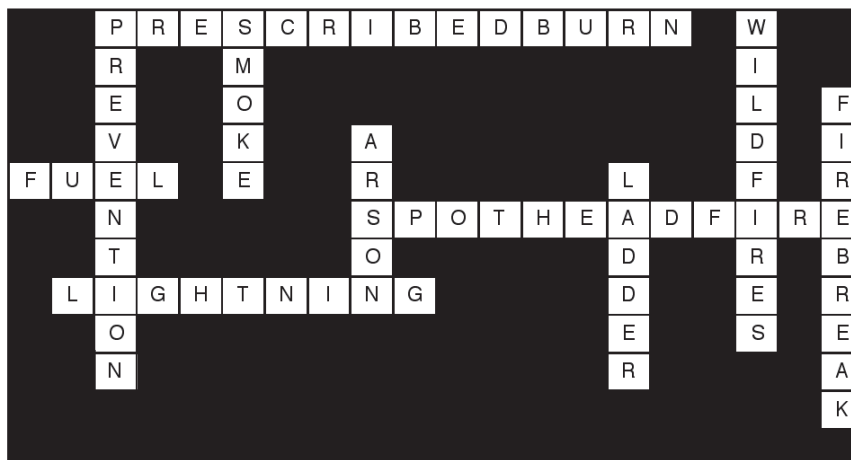
Student Assessment, Fire Tower, Page 17

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 23



Crossword, Page 24



Pretest/Post-test, Page 22

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

Wildlife Scramble, Page 25

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 30

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

County Guide to District Foresters' Offices

Kentucky Division of Forestry (State Office)
627 Comanche Trail
Frankfort, KY 40601
Phone (800) 866-0555 or (502) 564-4496

SOUTHEASTERN DISTRICT

Kentucky Division of Forestry
P.O. Box 130
Pineville, KY 40977
Phone (800) 866-0504 or
(606) 337-3011

Bell Knox McCreary
Clay Laurel Rockcastle
Harlan Leslie Whitley
Jackson

SOUTH CENTRAL DISTRICT

Kentucky Division of Forestry
120 Gaines Drive
Campbellsville, KY 42718
Phone (800) 866-1007 or
(270) 465-5071

Adair Lincoln Pulaski
Boyle Marion Russell
Casey Mercer Taylor
Clinton Metcalfe Washington
Cumberland Monroe Wayne
Green

WESTERN DISTRICT

Kentucky Division of Forestry
P.O. Box 349
Mayfield, KY 42066
Phone (800) 866-0802 or
(270) 247-3913

Ballard Fulton Lyon
Caldwell Graves Marshall
Calloway Hickman McCracken
Carlisle Livingston Trigg
Crittenden

KENTUCKY RIVER DISTRICT

Kentucky Division of Forestry
P.O. Box 702
Hazard, KY 41702
Phone (800) 866-0503 or
(606) 435-6073

Breathitt Lee Perry
Estill Letcher Powell
Knott Owsley Wolfe

BLUEGRASS DISTRICT

Kentucky Division of Forestry
P.O. Box 516
Frankfort, KY 40602
Phone (800) 866-0876 or
(502) 573-1085

Anderson Gallatin Oldham
Boone Garrard Owen
Bourbon Grant Pendleton
Bracken Harrison Scott
Campbell Henry Shelby
Carroll Jassamine Trimble
Fayette Kenton Woodford
Franklin Madison

NORTHEASTERN DISTRICT

Kentucky Division of Forestry
255 Rodburn Hollow Road
Morehead, KY 40351
Phone (800) 866-0052 or
(606) 784-7504

Bath Fleming Montgomery
Boyd Greenup Morgan
Carter Lewis Nicholas
Clark Mason Robertson
Elliott Menifee Rowan

EASTERN DISTRICT

Kentucky Division of Forestry
P.O. Box 189
Betsy Layne, KY 41605
Phone (800) 866-0048 or
(606) 478-4495

Floyd Lawrence Martin
Johnson Magoffin Pike

CENTRAL DISTRICT

Kentucky Division of Forestry
129 Howell Drive
Elizabethtown, KY 42701
Phone (800) 550-6601 or
(270) 766-5010

Allen Hancock Meade
Barren Hardin Nelson
Breckinridge Hart Simpson
Bullitt Larue Warren
Edmonson
Grayson

GREEN RIVER DISTRICT

Kentucky Division of Forestry
P.O. Box 465
Madisonville, KY 42431
Phone (800) 866-0770 or
(270) 824-7527

Butler Hopkins Ohio
Christian Logan Todd
Daviess McLean Union
Henderson Muhlenberg
Webster

SUPPLEMENT

Name_____

What is Fire?**CATS - Type Guided Practice (Multiple Choice)**

1. Which of the following is something a forest does not need to survive?
 - a. fire
 - b. sunshine
 - c. water
 - d. none of the above
2. In Kentucky, there are about _____ wildfires each year.
 - a. 500
 - b. 1,000
 - c. 2,000
 - d. 10,000
3. Between 2 and 5% of wildfires are started by lightning. Lightning will start a fire in a tree because it contains moisture. What is the tree called in this situation?
 - a. insulator
 - b. conductor
 - c. producer
 - d. consumer
4. The “fire triangle” consists of all the following, *except*:
 - a. lightning
 - b. fuel
 - c. heat
 - d. oxygen
5. The living and nonliving things in an environment and all their interactions is called a(n):
 - a. fuel
 - b. habitat
 - c. ecosystem
 - d. forest

Open Responses:

1. Fire can affect your life in many ways. List at least three ways fire affects your life and explain how your life would change if fire was not available in those three situations.
2. Fire needs heat, fuel, and oxygen to burn. These three elements are equally important, and all necessary. The fire will not burn without each of these ingredients. Construct a diagram to show the relationship between these three elements.

SUPPLEMENT

Name_____

Good Fires/Bad Fires**CATS - Type Guided Practice (Multiple Choice)**

1. Which of the following is not a way man first used fire?
 - a. light
 - b. warmth
 - c. cooking
 - d. shelter
2. Which of the following is an example of a good fire?
 - a. prescribed burn
 - b. arson
 - c. lightning
 - d. debris burning
3. Which of the following is the most common cause of wildfires in Kentucky?
 - a. debris burning
 - b. out of control campfires
 - c. equipment use
 - d. arson
4. Which of the following is an example of a bad fire?
 - a. campfire
 - b. candle
 - c. arson
 - d. gas grill
5. Unlike with wildfires, land managers can control and closely monitor the effects of what kind of fires?
 - a. hot
 - b. prescribed
 - c. wild
 - d. lightning

Open Responses:

1. Explain why and how a land manager would intentionally start a fire in the forest.
2. Using the article, **Good Fires and Bad Fires**, compare and contrast the differences between good fires and bad fires.
3. Arson is a serious crime punishable by the law. Name and explain at least two ways the public could be educated about the dangers of setting fires in Kentucky's forests.

SUPPLEMENT

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.

BAD FIRES

A fire that burns out of control and destroys anything in its path is an example of a bad fire. Wildfires in the forest fall in this category. Over the last ten years Kentucky has averaged 1,482 wildfires and burned 63,059 acres annually. The years 1999, 2000, and 2001 were especially bad, averaging 2,004 fires and 150,460 acres burned.

In Kentucky there are three main causes of wildfires. These are arson, debris burning, and equipment use. Arson is the #1 cause of wildfires in Kentucky.

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 second leading cause of wildfire in Kentucky debris burning. 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.

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 areas after lightning storms and during periods of high fire danger are some of the things forest ranger technicians can do to control the damage caused by lightning strikes.

SUPPLEMENT

Name_____

District Office**CATS - Type Guided Practice (Multiple Choice)**

1. A fire plow used by forest rangers is an example of what type of machine?
 - a. simple
 - b. complex
 - c. cool
 - d. compound
2. One type of **simple** machine a forest ranger uses to fight a forest fire is a ____?
 - a. chainsaw
 - b. plow
 - c. wedge
 - d. axe
3. What is the name of a person who is responsible for planning when and how to conduct prescribed burns?
 - a. land manager
 - b. forest ranger
 - c. fire fighter
 - d. fire scientist
4. Forest rangers are sent to wildfires when fires are reported by:
 - a. fire tower lookouts
 - b. patrol airplanes
 - c. citizens who call 911
 - d. all of the above
5. Fire danger is influenced by all of the following *except*:
 - a. relative humidity
 - b. temperature
 - c. wind
 - d. air quality

Open Responses:

Compare and contrast the job duties of a land manager and a forest ranger.

- 1.
2. How is the job of a structural fireman different from that of a forest ranger? If had to choose between one these two careers, which one would you pick and why?

SUPPLEMENT

Name_____

Fire Tower

CATS - Type Guided Practice (Multiple Choice)

1. 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 disease of plants
 - d. help desirable plants reproduce
2. The recommended area to clear around a campfire is a circle with a _____ foot diameter.
 - a. 4
 - b. 8
 - c. 10
 - d. 100
3. To make a home “firewise” one 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
4. Which of the following would be a reason **not** to have a prescribed burn in a forest?
 - a. to eliminate an undesirable species of tree
 - b. to create a meadow for wildlife
 - c. to clear an area of all plant and animal life
 - d. to stimulate new growth of plant life
5. All of the following are affected by a prescribed burn *except*:
 - a. people
 - b. plants
 - c. animals
 - d. nearby buildings

Open Response:

1. Using the “Home Hazards” picture on the next page. List and describe at least four things that could be done to this house to make it safer in the woods.

SUPPLEMENT

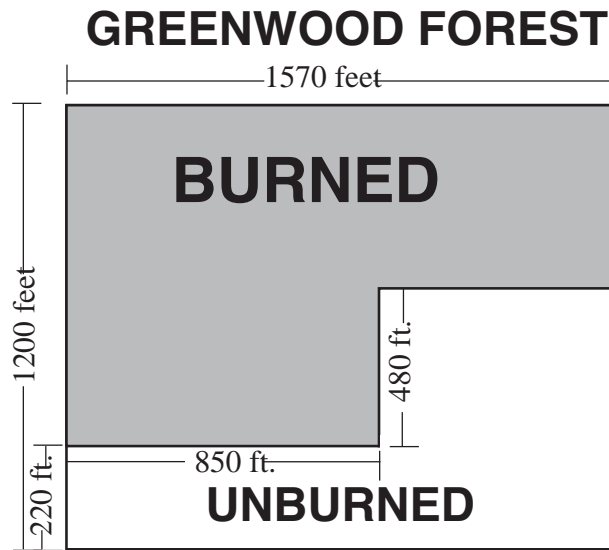


SUPPLEMENT

Name _____

Fire Tower**CATS - Type Guided Practice (Math)**

The shaded area of the Greenwood Forest diagram represents a wildfire.



1. What is the area (in square feet) of the forest that burned in the following diagram?
Then convert the area into acres. (HINT: There are 43, 560 feet in one acre).

SUPPLEMENT

Name_____

Other Writing Prompts**CATS - Type Guided Practice (Open Responses)****Math**

An arsonist started a forest fire and destroyed 45 of Mr. Jones' 120 acres. Draw a pie graph that illustrates the amount of forest destroyed by the arsonist. Tell at least two ways this fire would impact Mr. Jones.

Practical Living

You and two of your friends decide to go camping one weekend. In order to cook and keep warm, you will have to build a campfire. List and describe the proper way to take care of a campfire from beginning to end.

Practical Living

If you should spot a forest fire, what steps should be taken to put out the fire?

Reading

Smokey Bear has been a successful and recognizable advertisement for the United States Forest Service in the prevention of forest fires. Observe the Smokey Bear advertisement on the next page. Write a paragraph describing the message that the picture represents.

Reading, On Demand Writing

Using the information from the article, *Portion from the Fire Tower*, write a feature article informing the citizens of your community about the benefits of a prescribed burn.

Social Studies

The Daniel Boone National Forest is named for one of Kentucky's most famous explorers. Name and describe at least three contributions Daniel Boone has made to Kentucky.

SUPPLEMENT



SUPPLEMENT

What is Fire? (p. S1)

1. d
2. c
3. b
4. a
5. c

Good Fires/Bad Fires (p. S2)

1. d
2. a
3. d
4. c
5. b

District Office (p. S4)

1. a
2. d
3. b
4. d
5. d

Fire Tower (p. S5)

1. b
2. c
3. d
4. c
5. d

Fire Tower-Math (p. S7)

1. 1,193,000 square feet, which is approximately 27.3875 acres

KENTUCKY WILDFIRE PREVENTION EDUCATIONAL STANDARDS

		What is Fire?	Good Fires/Bad Fires	District Office	Fire Tower
Reading	RD-E-2.0.6	•	•		
	RD-M-2.0.11	•	•		
	RD-M-3.0.17	•			
Writing	WR-E--1	•	•	•	•
	WR-E-1.3				•
	WR-E-1.4	•	•	•	
	WR-M-1	•	•	•	•
	WR-M-1.3				•
	WR-M-1.4	•	•	•	
Math	MA-E-1.3.1	•			
	MA-E-2.1.2				•
	MA-E-3.1.2		•		
	MA-E-4.1.2				•
	MA-M-1.2.3	•			
	MA-M-2.2.2				•
	MA-M-2.2.5				•
	MA-M-3.2.5		•		
Science	SC-E-1.2.3	•			
	SC-E-2.1.2		•	•	
	SC-E-2.3.1		•		
	SC-E-3.3.2	•	•		•
	SC-E-3.3.3	•	•	•	•
	SC-M-1.1.1	•			
	SC-M-1.3.2	•			
	SC-M-1.3.3	•			
	SC-M-2.2.1		•		
	SC-M-3.4.1		•		•
	SC-M-3.5.4	•			•
Social Studies	SS-E-1.1.3				•
	SS-E-1.3.3			•	
	SS-E-2.4.2				•
	SS-E-3.2.3			•	
	SS-E-3.4.3			•	
	SS-E-4.2.1				•
	SS-E-4.2.2				•
	SS-E-4.4.1				•
	SS-E-4.4.2				•
	SS-E-4.4.3				•
	SS-E-4.4.4				•
	SS-M-1.1.3				•
	SS-M-1.3.2			•	
	SS-M-2.4.2				•
	SS-M-4.1.2			•	
	SS-M-4.2.1				•
	SS-M-4.2.2				•
	SS-M-4.2.3				•
	SS-M-4.4.1				•
	SS-M-4.4.2				•
	SS-M-4.4.3				•
	SS-M-4.4.4				•

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

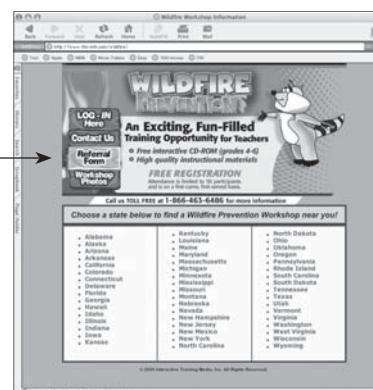
REFERRAL REGISTRATION

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 be 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.

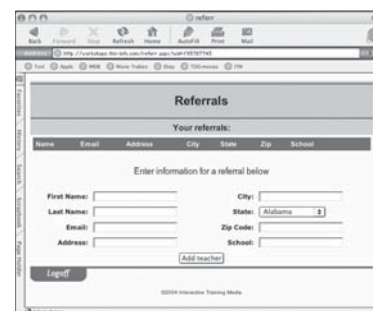


4. Fill in the text boxes on the next screen with information of the TEACHERS WITH WHOM THE CD-ROMS WERE SHARED. DO NOT ENTER *YOUR* CONTACT INFORMATION.

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 _____.

[illegible]

WORKSHOP EVALUATION

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

Location of workshop attended: _____

	<i>1 = Disagree</i>	<i>2 = Neutral</i>	<i>3 = Agree</i>
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 <i>Wildfire Prevention</i> materials (CD-ROM and Teacher's Guide) in the classroom.	1	2	3
5. I intend to plan a unit using the <i>Wildfire Prevention</i> 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? (<i>check one</i>)			
<input type="checkbox"/> E-mail <input type="checkbox"/> Flyer posted at school <input type="checkbox"/> Principal <input type="checkbox"/> Peer <input type="checkbox"/> Workshop facilitator <input type="checkbox"/> Other _____			
12. What were some of the reasons you came to this workshop? (<i>continue on reverse if needed</i>)			
13. Please list any other comments about the workshop, facilitator, facility, or materials. (<i>continue on reverse if needed</i>)			

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

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

Other(s) Signature(s)

___ 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 wildland/urban 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 wildland/urban interface and what are the fire issues concerning areas in the wildland/urban 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 wildland/urban 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 wildland/urban interface involves whom?

What additional things can communities in the wildland/urban 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 Helmet Respirator Heavy, steel-toe boots Heavy gloves		Nomex, lightweight clothing Hard hat Cloth face mask/shroud Lightweight leather boots Lightweight leather gloves
TOOLS	Fire truck Hoses Axe		Bulldozer Blower Pulaski GPS system Drip torch Fire swatter Weather gauges Brush hook
FIRE-FIGHTING METHODS	Focused on structures Uses extreme amounts of water Additional water from hydrants, if available		Focused on forests/structures Little or no water Uses tools to remove fuel
TRAINING	College degree not required Structural firefighting training Continuous training		College degree not required Wildland firefighting training 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.**