

22nd Annual Edition



fire safety

NEWSPAPERS IN EDUCATION

Working to create a fire-safe and burn-free Wisconsin

Fire Safety Week • October 6-12, 2019

Essay Contest
Teachers win up to
\$1,500 for your classroom!

.....
Poster Contest
Enter for a chance
to win!

See page 3 for details.

Featuring:

Main Story:
Consequences
of Fire



Life Saving
Information about
Smoke Alarms



Developing an
Escape Plan



Fire Sprinklers
How they Work



This special section was prepared by the Milwaukee Journal Sentinel marketing department. There was no editing or reporting from the newsroom involved.

Linda's Plan A Fire Safety Story

By: Lindsey McKee

“Girls, time for bed.”

Sophie and Linda are so involved in playing they don't hear Linda's mom announce their bedtime.

“Linda! Sophie! Bedtime!” Linda's mom says a little louder while laughing.

“Sorry, Mommy!” Linda says smiling.

“Yes, sorry, Mrs. Miller,” Sophie giggled.

The new friends had a remarkable first sleepover. Linda's mom ordered pizza. Sophie and Linda painted their nails. And the Miller family dog, Max, was the perfect third guest for the girls' tea party.

Long after brushing their teeth and settling into Linda's bed, the two girls whisper and silently laugh about their fun-filled day. At last, the two girls fall into a restful sleep.

Cause for Alarm

Beep...Beep...Beep...Beep...

Sophie wakes to the sound of the smoke alarm on Linda's bedroom ceiling.

“What's going on?” Sophie asks sleepily, barely opening her eyes.

“That's the smoke alarm,” Linda responds alertly. “There's a fire, we have to get out now.”

Linda quickly pushes back the covers, jumps out of bed, and pulls a half-asleep Sophie down to the bedroom floor.

“Wait. Smoke alarm?!” Sophie says, suddenly wide awake. “There's a fire?!”

“Don't worry,” Linda reassures her friend. “My family has a plan. Just stay low and follow me.”

Linda hurriedly crawls toward the entrance to her bedroom as Sophie follows close behind. Once they reach the door, Linda feels the doorknob with the back of her hand.

“The doorknob is cold; we can go out this way,” she declares.

Linda slowly opens the door, remaining crouched down. The girls close the door behind them then crawl out of the bedroom and into the smoke-filled hallway as darker smoke circles above their heads.

“The smoke hurts my eyes,” Sophie coughs.

“It's getting hotter, we have to move fast. Stay low and follow me to the front door,” Linda instructs Sophie.

Sophie nods in agreement, holding back frightened tears.

Further down the hallway, Linda heads toward the home entryway. But the girls are met by high heat and flames

blocking their escape. The smoke-filled living room's curtains are ablaze and wind from the open window blew the curtains toward flammable furniture and household items.

“What are we going to do now, Linda?” Sophie exclaims.

“There's another way out,” she answers.

Linda heads back down the hallway to the back door. The smoke seems to subside as they get closer to the rear of the home and away from the fiery living room. The girls are able to open the door and exit the burning home. But suddenly, Sophie stops dead in her tracks.

“Max!” Sophie cries. “He was in your bedroom. We have to go back and get him.”

Just as Sophie turns to rescue the puppy inside, Linda grabs her arm.

“No!” Linda cries. “You never go back inside a burning house. Firefighters will go inside to find Max and help him.”

Linda pulls a worried Sophie away from the house. They run to the big tree in front of the Miller home, the family's safe meeting place. Linda's parents are already waiting under the tree and their faces light up with relief as Linda and Sophie join them.

As the Millers embrace the girls, a fire engine arrives and a team of firefighters jump out and get right to work.

“Is there anyone inside?” one firefighter asks.

“Max!” Sophie exclaims.

“Just our dog,” Mr. Miller explains.

One group of firefighters begin battling the fire, while another group of firefighters enter the home. Soon, a firefighter emerges from the burning home with Max and places the pup in Sophie's arms.

A Life-Saving Lesson

Soon, the flames on the Muller home are extinguished. Firefighters discover the cause of the fire was a candle that got too close to the living room curtain.

Still holding Max, Sophie turns to Linda.

“Linda, that was so scary. How did you know what to do?” she asks.

“We practiced,” Linda tells her. “When my parents change the batteries in our smoke alarms around the house, we practice what we would do if there were ever a fire.”

Linda explains her family's fire escape plan to Sophie. It begins with getting out right away when she hears the

smoke alarm. Then she stays low and feels the bedroom doorknob for heat to make sure the door is safe to open.

Her parents then told Linda to try to escape through the front door, because it's closest to her bedroom, but to go to the back door if she can't leave out the front. Linda was instructed never to go back inside for anything and let the firefighters help anyone still in the house. Next, the family set a meeting place for when they make it out of the house, the old tree in the front yard.

“We even wrote our fire escape plan down as a family,” Linda says. “That's how I knew what to do. You don't have a fire escape plan at your house?”

“No,” Sophie ponders slowly shaking her head.

As the two girls talk, Sophie's mother arrives. Soon Sophie is wrapped in a tight embrace from her tearful and grateful mother.

“I'm all right, Mom,” Sophie says smiling up to her mother. “Linda and her parents had a fire escape plan.”

Linda's Fire Safety Checklist

- Sleep with bedroom doors closed
- Get out right away when you hear the smoke alarm
- Stay low to the ground to avoid smoke
- Check doors with the back of your hand for heat before opening
- Never go back inside for anyone or anything
- Go to the set meeting place outside of the home

Linda's Parents' Fire Safety Checklist

- Change the batteries in the smoke alarm twice per year, when you change your clocks*
- Test the fire alarm monthly to make sure it is working properly
- Replace smoke alarms older than eight to 10 years old*
- Have a fire escape plan and practice it with everyone in your home
- Set a meeting place outside of the home

* Follow manufacturer guidelines



Professional Fire Fighters of Wisconsin Charitable Foundation is working to create a fire-safe and burn-free Wisconsin through education, risk mitigation, and support for burn survivors, fire fighters, and communities statewide.

Contact Information: 321 E Main Street, Suite 200 Madison, WI 53703
(608) 630-8440 Mike@pffwcf.org

The Professional Fire Fighters of Wisconsin Charitable Foundation (PFFWCF) would like to thank the following people and organizations for their hard work and continued support of this lifesaving publication: The Milwaukee Journal Sentinel, Andy Johnson – NIE Supervisor, José Acevedo – Advertorial Coordinator; PFFWCF; Michael Wos – Executive Director, Eric Salzwedel – Program Coordinator; the Wisconsin Department of Public Instruction; and Wisconsin Department of Safety and Professional Services.



2018 1st Place overall - 6th Grader Zakary & 4th place overall - 6th Grader Emma.

Here's a chance for students to be recognized for promoting fire safety with their artwork. Suggestions for posters include emphasizing a safety tip, promoting National Fire Prevention Week, or promoting fire safety. All entries will be considered for use in upcoming promotions, including next year's Fire Safety Newspapers in Education Program, use on the PFFWCF website, and on social media. Contact Information: 321 E Main Street, Suite 200 Madison, WI 53703, (608) 630-8440, Mike@pffwcf.org.

Rules

Poster entries must meet the following criteria to be considered for the contest:

- Poster must be done by 1st - 12th grade student.
- Color or black and white art is acceptable in any media — pencil, ink, crayon, watercolor, etc.
- All entries must include the student artist's name, grade, school, teacher, address, telephone number, email (a school address, phone number, and email are acceptable). This information must either be written on the back of the artwork or firmly attached to the artwork for identification purposes.
- 8.5" x 11" or 11" x 17" final size.
- If you will be entering computer generated art, the finished piece must be submitted as a printed copy; electronic files will not be accepted.
- Only one entry per student.

Attention Students: Enter Our Poster Contest

You could win gift cards from the
Professional Fire Fighters
of Wisconsin Charitable Foundation

Deadline for poster entries:

Postmarked by December 20, 2019.

Awards will be posted by January 24, 2020.

Judging

- All entries will be judged by a panel of Wisconsin fire safety experts based on the following criteria:

50% Effectiveness of the message

25% Creativity

25% Artistic ability

- Please note that judges' decisions are final.

Prizes

\$100, \$50, and \$25 prizes for first, second, and third place within each grade level will be awarded.

***See Page 13 for Entry Form**

For more information go to www.pffwcf.org

Teachers:

Win up to \$1,500 for your classroom!

The Professional Fire Fighters of Wisconsin Charitable Foundation (PFFWCF) encourages all teachers to help prevent fires and burn injuries through education.

The PFFWCF will award \$500-\$1500 prizes to teacher classrooms. To enter, teachers are invited to write a one-page essay that either:

- Describes how you would use the award money to help increase fire safety in your school or community.
- Describes how you used this section in your classroom.
- Explains how you have been incorporating the Fire Safety section into your lesson plan throughout the academic year.
- Or choose a topic unique to your classroom or school. You may also want to enclose a photograph of a bulletin board you put up with an accompanying essay.

Mail your entry to:

PFFWCF Teacher Essay Contest

321 East Main Street, Suite 200

Madison, WI 53703

Essays must be postmarked by December 20th, 2019.

Your students can be partners with fire fighters. Using this section in conjunction with the Milwaukee Journal Sentinel will help students learn more about fire safety. We've also included Fire Safety Certificates to award to students who complete the home activities. Please encourage students to complete this with their families.

For more information about PFFWCF, visit www.pffwcf.org

Fireplace Injuries

ARTICLE SUBMITTED BY THE UW BURN CENTER



On a cold, wintry day, it can be relaxing to cozy up to the warmth that a fireplace can provide. Unfortunately, a young child, especially the young walker and explorer, does not realize how dangerous the face of a fire place can be. The temperatures of the glass doors of a gas fireplace can be a source of a burn injury especially to little hands and faces! While the original intent was to relax, a much different experience could ensue.

Facts:

- Gas fireplace glass doors can reach the high temperature of 1,300 degrees Fahrenheit.
- Serious burn injuries from the hot glass can happen in less than 1 second.
- Doors can remain hot for 1 hour or longer after use.
- The UW Burn Center treated 30 kids in the last 5 years for fireplace derived burn injury.
- New walkers, age 11-15 months are at the greatest risk.

To best prevent this type of burn, you can:

- Install a screen barrier.
- Closely supervise toddlers and young children around fireplaces and use safety gates.
- Make sure fireplace on switches and remote controls are out of the reach of children.
- Know that restaurants, hotels and the homes of loved ones may have gas fireplaces without screens. Therefore, keep a close watch on children while you visit.

Ouch! That's HOT!

JENNIFER NIELSEN, RN | ASCENSION COLUMBIA ST. MARY'S REGIONAL BURN CENTER

Approximately every minute, someone in the US sustains a burn injury serious enough to require treatment. Babies and older adults have thinner skin making it easier for these individuals to get a more severe burn at lower temperatures in a shorter amount of time. Kitchen, electrical, heater and smoking-related fires are the 4 most common types of fire. All burns can be prevented with a little knowledge on fire safety.

Did you know...

- The steam from a bag of microwave popcorn is hotter than 180 degrees Fahrenheit and can burn you in less than a second. Let the bag sit for a minute before opening and open away from you.
- Hot chocolate or coffee can be as hot as 140 degrees Fahrenheit. A scald burn can occur in less than 5 seconds!
- Sparklers can reach 2000 degrees Fahrenheit, hotter than a blow torch.
- Extreme heat causes more deaths per year than hurricanes, lightning, tornadoes, earthquakes, and floods combined! Stay cool and keep hydrated!
- A sunburn, without blisters, is a first degree burn! You can get sun-burned on a cloudy day! Apply sunscreen frequently and generously!

Cool Fix (If a burn injury does happen...)

- Cool the burn with **COOL** (not cold) water to stop the burning process
- Remove all clothing and jewelry from the injured area
- Cover the area with a dry clean sheet or loose bandages
- Seek medical attention

Classification of Burns

ARTICLE SUBMITTED BY THE CHILDREN'S HOSPITAL OF WISCONSIN BURN CLINIC
[HTTPS://CHW.ORG/MEDICAL-CARE/BURN-PROGRAM](https://chw.org/medical-care/burn-program)

What are the classifications of burns?

Burns are classified as first, second, or third-degree, depending on how deep and severe they penetrate the skin's surface.

First-degree (superficial) burns

First-degree burns affect only the epidermis, or outer layer of skin. The burn site is red, painful, dry, and with no blisters. Mild sunburn is an example. Long-term tissue damage is rare and usually consists of an increase or decrease in the skin color. Sun burns and flash burns (a sudden, brief burst of heat) are examples of common first-degree burns. The most common signs and symptoms of a first-degree burn are redness and dry skin. Skin maybe painful to the touch for 48 to 72 hours. However, each child may experience symptoms differently.

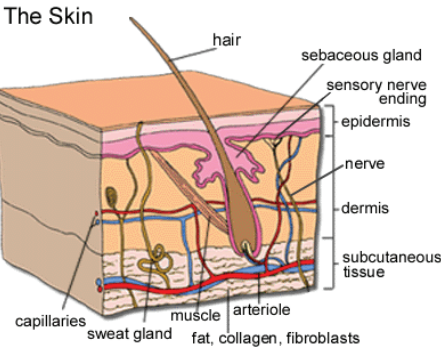
Second-degree (partial thickness) burns

Second-degree burns involve the epidermis and part of the dermis layer of skin. The burn site appears red, blistered, and may be swollen and painful. In most cases, second-degree burns are caused by scalding hot

water, flames, and when skin briefly comes in contact with a hot object. The most common signs and symptoms of a second-degree burn are blisters, deep redness, burn area that may appear wet or shiny, skin that is painful to the touch, and skin that maybe white or discolored in an irregular pattern. However, each child may experience symptoms differently.

Third-degree (full thickness) burns

Third-degree burns destroy the epidermis and dermis. Third-degree burns may also damage the underlying bones, muscles, and tendons. The burn site appears white or charred. There is no sensation in the area since the nerve endings are destroyed. In most cases, third-degree burns are caused by a scalding hot liquid, skin that comes in contact with a hot object for an extended period of time, flames from a fire, an electrical source, or a chemical source. The most common symptoms of a third-degree burn are dry and leathery skin, black, white, brown, or yellow skin, swelling, and lack of pain because nerve endings have been destroyed. However, each child may experience symptoms differently. Large third-



degree burns heal slowly and poorly without medical attention. Because the epidermis and hair follicles are destroyed, the new skin heals slowly and typically results in a scar that may be disfiguring and impair function.

What is a skin graft?

A skin graft is a piece of the child's unburned skin which is surgically removed to cover a burned area. Skin grafts can be thin or thick. Skin grafts are performed in the operating room. The burn that is covered with a skin graft is called a graft site.

What is a donor site?

The area where the piece of unburned skin was taken to be donated to a burned area is called a donor site. After a skin graft procedure, the donor sites look like a scraped or a skinned knee. A physician will decide if a skin graft is needed. A skin graft is often performed after debridement or removal of the dead skin and tissue.

Graft site care:

The dressing is left on the graft site for two to five days before it is changed, so that the new skin will stay in place. For the first several days, graft sites need to be kept very still and protected from rubbing or pressure.

Donor site care:

The donor site is covered for the first one to two weeks. The site needs to be kept covered. Donor sites usually heal in 10 to 14 days. If a dressing is applied, it usually remains on until it comes off by itself. Lotion is applied to the donor site after the dressing comes off. This skin often flakes off and looks dry.

When you think about getting burned, you probably think of fires and not about a scald burn. A scald burn occurs when the skin comes in contact with a hot liquid or steam. Young children and the elderly are at greater risk of a more serious injury from a hot liquid, as their skin is much thinner than an adults. The majority of scald burn injuries occur in the kitchen and bathroom. Here are some ways to help keep safe:

1. Have your caregiver in the kitchen with you when you are cooking.
2. Keep little children out of the kitchen when cooking.
3. Be sure to use oven mitts or hot pads when taking the hot food out of the microwave.
4. When opening a container that has been in the microwave, always be sure to open the container away from your body. This will allow the steam to come out away from you.

5. Use the back burners on the stove so the pans don't accidentally get bumped or pulled off the stove.
6. Keep hot food and beverages away from the edge of the counter or table.
7. Do not place hot liquids, such as soup, in your lap when you eat it.
8. Have your parents or caregivers set the hot water heater to 120 degrees Fahrenheit. Always test the temperature of the bath water before getting into the tub, and test the temperature of the water from any faucet before putting your hand under the water.

IF you should get a scald burn:

1. Remove any clothing from the burn.
2. "Cool the Burn." Run cool water over the burn for 10-20 minutes. Do not apply ice, creams, or other products to the burn.

3. Cover the area with a clean dry dressing.
4. Seek medical help.

For more information of fire safety, please visit safekidswi.org.

SAFE
KIDS
WISCONSIN

How Fire Sprinklers Work

Did you know a home fire can become deadly in two minutes or less?

Fire happens fast! There is little time when a fire starts. In less than 30 seconds a small flame can grow to a major fire filling the home with smoke. There is only time to escape. While the fire starts bright it quickly produces black smoke and complete darkness. This may make you feel blinded and disoriented delaying your escape. Smoke and toxic fumes can make you drowsy, disoriented and short of breath. They can lull you to sleep and cause you not to wake up in time to escape. Within minutes the room temperature can rise to over 100 degrees Fahrenheit at floor level and 600 degrees Fahrenheit at eye level. This heat can hurt your lungs and melt your clothes to your skin.

Fire Sprinklers Always Available

Home fire sprinklers include a network of piping filled with water under pressure that are installed behind the walls and ceilings, and individual sprinklers are placed along the piping to protect the areas beneath them. Because the water is always in the piping, fire sprinklers are always “on call.” If fire breaks out, the air temperature above the fire rises and the sprinkler activates when the air temperature gets high enough. The sprinkler sprays water forcefully over the flames, extinguishing them completely in most cases, or at least controlling the heat and limiting the development of toxic smoke until the fire department arrives. Only the sprinkler nearest the fire activates. Smoke will not activate sprinklers.

Water supply

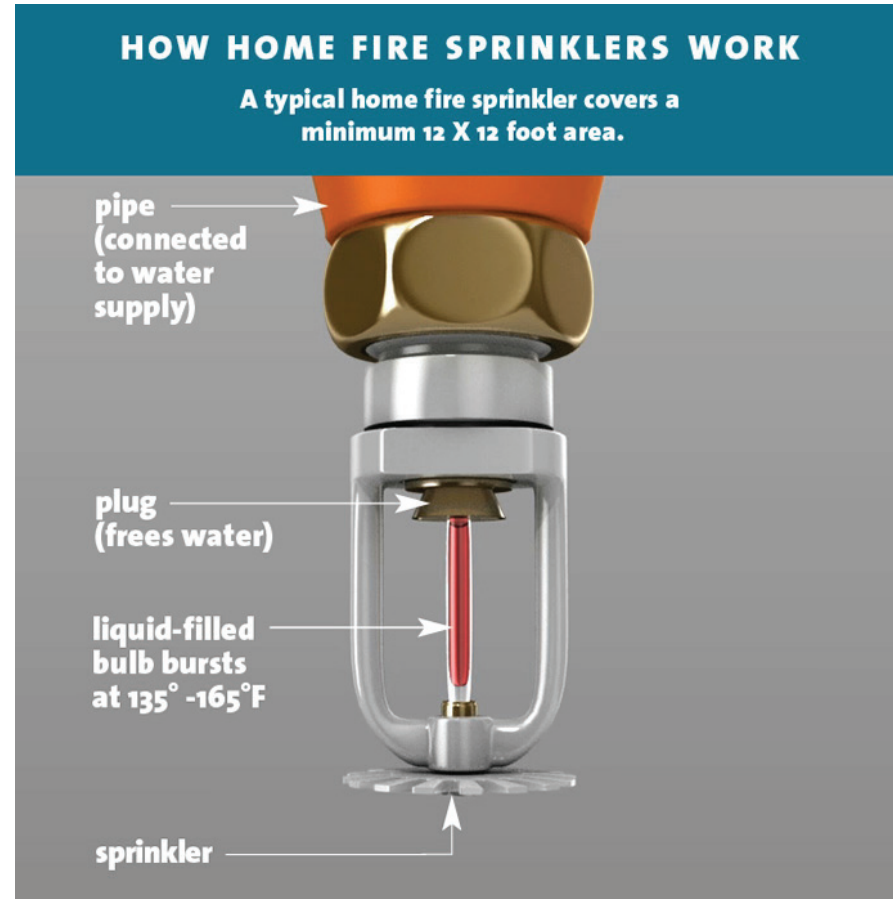
Sprinklers connect to your home’s water supply. In some homes, a tank and pump are used. The water is ready if a fire starts. Home fire sprinklers release approximately 10-25 gallons of water per minute, less than the 125 or more gallons of water per minute from fire fighting. In less time than it typically takes the fire department to arrive on the scene, sprinklers contain and even extinguish a home fire. That not only reduces property damage, it saves lives.

Fire sprinklers work automatically

Each sprinkler works on its own. A special plug keeps the water in the pipes when it’s not needed. If a fire starts, its heat surrounds the area below the sprinkler and causes the plug to open. That lets water flow on the flames. Only the one sprinkler closest to the fire opens. All the other sprinklers remain sealed, so the water is confined to just the area of the fire.

Fire Sprinklers are simple, reliable and proven.

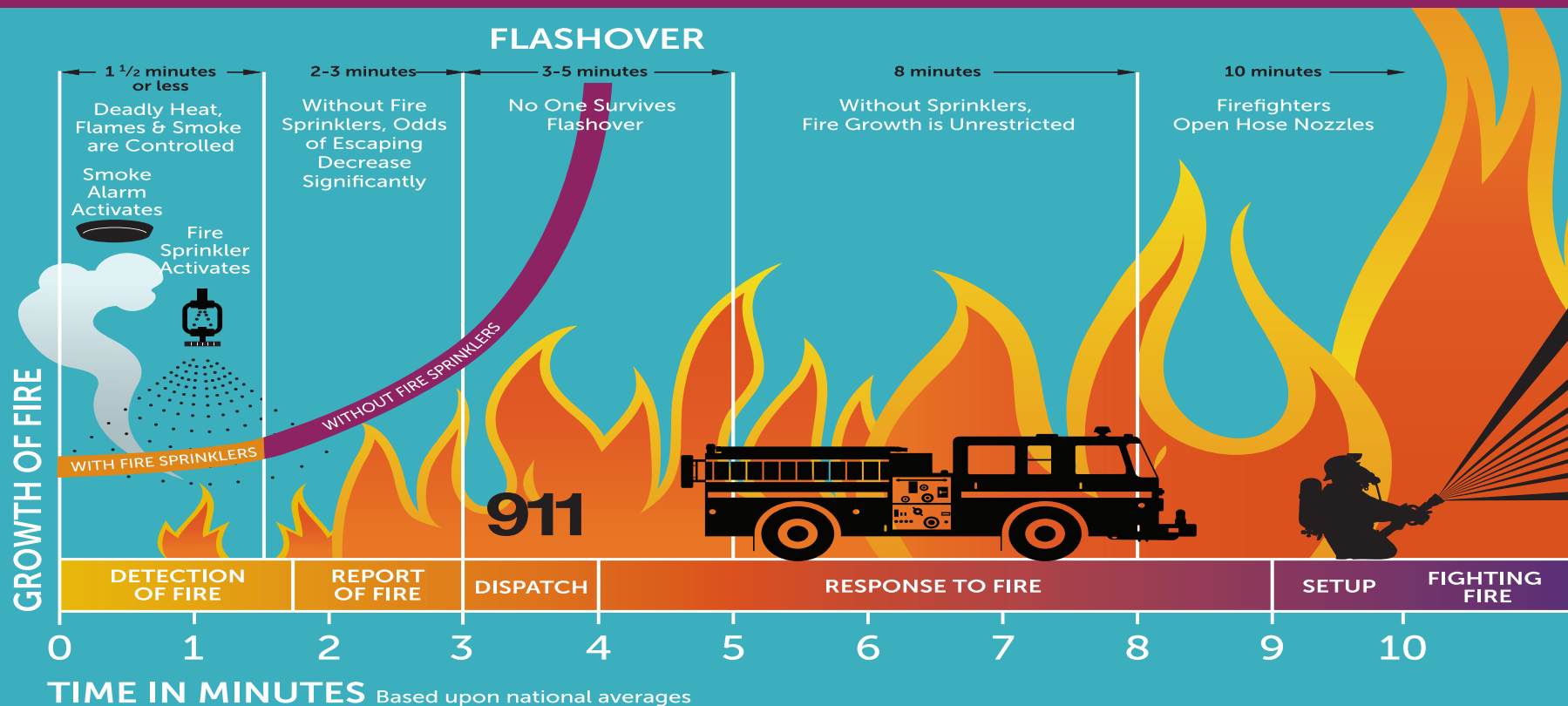
Fire sprinklers protect people, pets and property 24 hours a day, seven days a week, 365 days a year.



Home Fire Sprinkler[®]
COALITION
Protect What You Value Most[™]
HomeFireSprinkler.org



HOME FIRE TIMELINE



Home Fire Sprinkler®

COALITION
Protect What You Value Most™

HomeFireSprinkler.org

It's 12:53 a.m.

10 seconds You and everyone in your home are sound asleep. Ten seconds ago, a small fire started in your living room. In the next five minutes, your life may change forever. Or you may just need to clean up in the morning and air out the house.

It will all depend on whether or not you have fire sprinklers protecting your home.

Every 84 seconds, there is a house fire in the United States. More than 3,000 Americans die in fires every year, 85% of them in home fires. The victims are usually children and older adults. Although the majority of home fires start during the day, most fatal fires start at night. Like this one.

1 minute One minute after the fire starts, the smoke alarm sounds. You awaken. You don't smell smoke, but you get up to check. It takes almost 30 seconds to get out of bed and exit the room.

90 seconds As you exit, you start to smell smoke. You see smoke billowing out of the living room. The curtains in the room are in flames. The temperature at the ceiling is approaching 1,000 degrees Fahrenheit. You are forced to "stay low and go."

2 minutes If your home has fire sprinklers, heat activates the single sprinkler closest to the fire. Within seconds, the flames are controlled and may be extinguished. Smoke in the living room starts to clear, buying you time to get out alive, while saving your property.

2 min. 9 sec. If your home is not protected by fire sprinklers, you have to crawl through thick, hot smoke to get out. You yell to warn others in your home, you are blinded by smoke, and you fear for the safety of others in your home. You will not survive in this environment much longer. The fire is not bright. It is hidden by thick, black smoke. Modern building materials and furnishings give off poisonous gases as they burn. Most people who die in fires don't die from burns. Smoke and toxic fumes are almost always the killer.

Fire sprinklers save lives and property.

2 min. 25 sec. In the blackness, you collide with your family members. You all know what to do because you practiced your fire escape plan. Your house is filled with deadly smoke. Your family safely reunites at your safe meeting place and activates 911.

Fire spreads through your home. The temperature at the living room ceiling approaches 1,400 degrees Fahrenheit.

Homes protected by fire sprinklers save lives and cause far less damage because they stop a fire when it is small and use far less water than the Fire Department does when they arrive.

3 min. 57 sec. You are glad that everyone is out safe, but sad that you've lost everything. Seconds later, the living room is enveloped in flames as everything in the room reaches ignition temperature and catches fire. This is known as flashover.

4 min. 16 sec. Fire is amazingly fast. In less than five minutes, the fire is out of control.

6 min. 12 sec. The Fire Department arrives on the scene to find fire coming out the windows of your home. They deploy their fire hoses and spray water at a rate of 150 to 300 gallons per minute.

If you have fire sprinklers, you may spend the time describing the fire and how it was controlled. If not, they will get to work extinguishing the fire. The fire fighters will put out the hot spots, turn off the water, and work to save your property.

Fire sprinklers use less than 341 gallons of water to put out an average fire.* Fire fighters use more than 2,935 gallons for an average fire. *According to the Scottsdale Report

With fire sprinklers, an average fire will cause \$2,166 in damage. Without fire sprinklers, an average fire will cause \$45,019 in damage. A fire like this one is likely to cost more than 10 times that much.

Fire sprinklers save lives and property.

Presented by Home Fire Sprinkler Coalition/www.homefiresprinkler.org

Fire Forensics: Claims and Evidence

As fire burns it leaves clues in its path – evidence visible only to a trained Fire Investigator. Using what they know about fire and fire behavior, investigators hunt for clues, collect evidence and report on what happened. Fire Investigation is an important part of Fire Prevention. It is a complex job that involves Science, Technology, Engineering and Math (STEM).

Learning these skills is critical to developing a knowledge base that could one day help eliminate certain causes of fire.

Sound interesting? Great! Let's start with fire science basics.

Welcome to the Fire Investigator Training Academy!

By: Ginger Sommer and Dennis Avelar

What is Fire?

Fire is a gas-phase chemical reaction that emits heat and light.

Stage 1 - Ignition

- During a fire, solids and flammable liquids do not burn. Only gases burn.
- Fire is the result of fuel gases mixing with oxygen and heat in the correct proportion.



Stage 2 - Pyrolysis

- Pyrolysis is when heat converts solids and liquids into fuel gases.



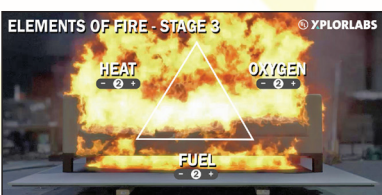
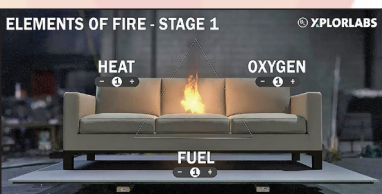
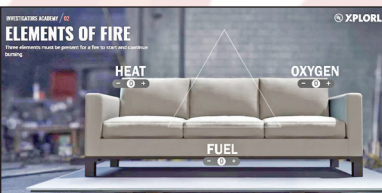
Stage 3 - Combustion

- These fuel gases mix with oxygen, and when ignited by heat, result in flaming combustion.
- Another word for fire is combustion.



Elements of Fire

Three elements must be present for a fire to start and continue burning.



Primary

- What's needed to create and sustain fire?
- A fire requires all three elements. Adjust one of the elements and it changes the fire.
- Remove just one element and the fire will go out, or extinguish. Fire exists only when all three elements of the Fire Triangle work together.

Stage 1

- Oxygen is in the air. Just like we need it to live, fire needs it to burn.
- Oxygen is the most common element on Earth.

Stage 2

- Heat is thermal energy that produces fuel gases (pyrolysis) and causes ignition.
- Heat is the thermal energy needed to produce the fuel that combines with oxygen. Heat promotes the fire growth and the spread of flames by maintaining a continuous cycle of fuel production and ignition.

Stage 3

- Fuel is any substance that combusts after converting to a gas in the presence of heat.
- Wood, furniture, carpeting... just about any material that surrounds us is potential fuel. When heated, these materials create gases and combine with oxygen. With the heat, the gases ignite and release light, heat and smoke. This is fire.

Four Stages of Fire Development



Stage 1 Ignition

- Heat, oxygen and a fuel source combine. The result of this chemical reaction is fire.
- This gas-phase chemical reaction causes the fire to start.



Stage 2 Growth

- The fuel load will continue to burn because oxygen is available.
- As long as there's enough oxygen in the room, the fire continues to burn



Stage 3 Full Development

- All combustible materials are ignited with enough oxygen.
- If a steady supply of oxygen exists, all the combustible fuels will be consumed in the fire.



Stage 4 Decay

- Usually the longest stage of a fire, with oxygen, heat and fuel decreases until the fire goes out.
- With ample oxygen, the fire only stops burning after the fuel has been completely consumed. Some fuels leave behind evidence such as char, ash or other chemicals.

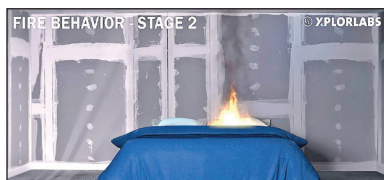
Fire Behavior

The Behavior of Fire in a Closed Room



Stage 1

- During a fire, gases and smoke move because of differences in temperature, density, and pressure.
- During a fire, heat is transferred to gases in the room. This results in the gases expanding.



Stage 2

- As the gases are heated and become buoyant, they flow upward, forming a thermal plume.
- Heated gas is less dense than the air surrounding it. Because the surrounding air hasn't been heated at this stage, a thermal plume – a column of smoke and hot gases – moves upward.



Stage 3

- A ceiling jet – a thin layer of hot gases – spreads out along the ceiling.
- When the thermal plume reaches the ceiling, it turns and continues to move away from the heat source forming a ceiling jet – a relatively thin layer of hot gases that spreads out along the ceiling.



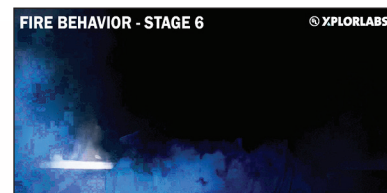
Stage 4

- When the ceiling jet reaches the walls, a hot gas layer forms and pressure increases.
- The hot gas layer forms and pressure increases because the ceiling and walls of the room are limiting further expansion of the hot gas.



Stage 5

- Combustion continues if the chemical reaction has available fuel, oxygen, and heat.
- The smoke, which is full of heated gases, increases in temperature and pressure. As long as fuel, oxygen and heat are present in the right amounts, combustion continues.



Stage 6

- Without an outside air supply, the oxygen in the room depletes and combustion stops.
- In the previous example of the sofa burning out in the open, the fire went into decay because the fire was limited by the available fuel. In the instance of a closed-room fire, the fire goes into decay because it consumed all of the oxygen needed for combustion. This is called ventilated-limited fire in a closed room.

Ventilation

The Impact of Ventilation (Outside Air) on Fire



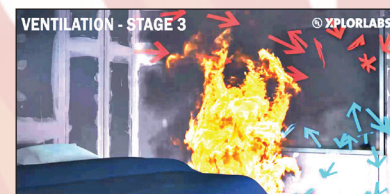
Stage 1

- An opening to outside air during a structure fire allows for ventilation.
- Ventilation is the exchange of hot fuel gases and air. Any opening in a structure can allow ventilation to occur.



Stage 2

- During ventilation, hot gases flow out (exhaust) and cooler air enters (intake) the room.
- In this example, buoyant hot gases, or exhaust, flow out of the open window while the intake, denser and cooler air that's loaded with more oxygen, enters the room low to the ground.



Stage 3

- The effect is like a pump feeding a fresh source of oxygen to the fire.
- High pressure flow to low pressure with the pumping of fresh, oxygen-rich air. The fuel load will continue to burn as long as oxygen is available.
- With good ventilation, or a steady source of oxygen, a fire can grow until flashover occurs. Flashover causes everything in the room to pyrolyze and ignite all at the same time. Ventilation often makes a fire bigger, especially in structures with large amounts of synthetic material as potential fuel.

Congratulations!

Welcome to the fascinating world of fire forensics! Ready for your first challenge? Proceed with caution:

There's been a fire!

Your job is to solve the case – figure out where the fire started (point of origin) and how (cause).

Fire investigation is like reading a story backwards – you enter the scene at the end, seeing black walls and charred debris.

Fire investigators have to rely on their training and work backwards – using the scientific method to fill in the story by examining the clues left behind as evidence is gathered and analyzed.

Enter the Fire Lab (insert the ULR www.ulxplorlabs.org)

What Do You Know About Fire?

LISA BRAXTON | NATIONAL FIRE PROTECTION ASSOCIATION

If you've been to a campfire, blown out birthday candles, or enjoyed the warmth of a fireplace, then you've witnessed the process known as fire. Fire is a chemical reaction, the same chemical reaction that occurs if you bite into an apple, leave it on the counter, and it turns brown—or, the chain on your bicycle gets rusty, but there's a difference.

Do You Know How Fire Works?

The big difference between fire and your half-eaten apple is speed. Fire is an oxidation process—combining oxygen with another substance—that happens very fast so that light, heat, and sound are released. Think of the snap, pop, and roar you hear, intense warmth, and a flickering bright blue, white, orange, or orange and yellow flame.

How Is a Fire Created and What Keeps It Going?

It all starts with a fire triangle, the three elements that must be present to have a fire: fuel (which is something that will burn), heat (enough to make the fuel burn), and air (which provides oxygen). Almost anything can be fuel: paper, books, plastics, furniture. Remove one of these elements and the fire goes out. In recent years, a fourth element has been added—the uninhibited chemical chain reaction—which provides the process needed to maintain the fire. This fourth component forms what is called the fire tetrahedron.

The Stages of Fire

Fire isn't stagnant. It evolves and develops into the following four stages:

Ignition: This first stage begins when fuel, oxygen, and heat join together in a chemical reaction resulting in fire. Sometimes a fire in this stage is very small and goes out on its own. In other cases, it may smolder for a long time.

Growth: With the initial flame as a heat source, additional fuel ignites. The size of the fire increases and the plume reaches the ceiling. Hot gases collecting at the ceiling transfer heat, allowing all fuels in a room to come closer to their ignition temperature at the same time.

Fully Developed: Fire has spread over much if not all the available combustible materials and temperatures reach their peak, resulting in heat damage. Oxygen is consumed rapidly. This is the hottest phase of the fire and the most dangerous for anyone trapped. When all of the things in the room or space are burning, that is a condition known as flashover.

Decay: The fire consumes available fuel, temperatures decrease, fire gets less intense. In other words, there is nothing left to burn.

The Power of Fire

Many people don't realize how powerful fire can be. It can cause temperatures to rise to extremes. Even a small candle flame will burn at 1,800 degrees Fahrenheit (982 degrees Celsius). It can spread fast, generating smoke that is toxic and making it difficult to breathe. The smoke also makes it very difficult to see even objects that are right in front of you. A fire in your home can become life-threatening in a matter of minutes. But did you know that there are a few simple steps that you and your family can take to be safe in your

home if a fire happens? Planning ahead is key.

Smoke Alarms

In a fire, seconds count. Working smoke alarms can give you the time you need to escape to safety. Smoke alarms should be installed and maintained in every home. They should be installed inside and outside of each sleeping area and on every level of your home. Check smoke alarms every month with your family, using the test button to make sure they are working properly.

In the Kitchen

Only if you have been taught how and have permission should you use the stove, oven, or microwave oven. Stay in the kitchen while you are cooking and keep anything that can burn away from the stove. Keep a lid nearby to smother flames if necessary. If you are watching younger children, keep them at least three feet (one meter) away from the stove, oven, or microwave oven. Do not use matches or lighters. Keep them away from children.

Be a Hero for Fire Safety

Planning and practicing a home fire escape plan can have a life-saving impact. With this in mind, the National Fire Protection Association® chose this year's Fire Prevention Week™ theme: "Not Every Hero Wears a Cape. Plan and Practice Your Escape!™" You can do your part to motivate everyone in your household to get involved and become an everyday hero:

- Draw a map of your home showing all doors and windows.
- Go to each room as a family and point to two ways out.
- Talk about the plan with everyone in your home.
- Have an outside meeting place in front of your house, a safe distance away where everyone can meet.
- Have an adult push the test button on the smoke alarm to start the fire escape drill. Practice using different ways out.
- Get out and stay out. Never go back for people, pets, or things.
- If you are babysitting outside of the home, review the fire escape plan with the family.

Fire Facts

- Working smoke alarms save lives, cutting the risk of dying in a home fire in half.
- On average, seven people die in a home fire in the US per day.
- Four of every five fire deaths are caused by home fires.
- Fire can spread rapidly, leaving families as little as two minutes to escape.
- Only one of every three households in the US have actually developed and practiced a home fire escape plan.

The Many Different Roles in the Fire Department

Do you care about your community, like physical challenges, and want to work as part of a team? A career in the fire service could be worth considering. Members of the fire service rescue people from burning buildings and cars but can also handle a host of other responsibilities.

Fire departments have many important positions:

- Paramedic or emergency medical technician
- Educator who teaches children and adults how to stay safe from fire
- Inspector to make sure buildings are safe
- A plans reviewer who looks at the proposed development of new buildings before construction starts
- Data and information expert who analyzes information on how many people the fire fighters help in their community
- Public information officer who provides fire news to the media

Qualities needed to be a good member of the fire service are the same as those needed to be a good student: being a hard worker, physically fit, helping others, interested in continually learning and training, and responsible.

Visit sparky.org for fire safety information and fun activities for kids and firepreventionweek.org for activities for all ages, safety messaging, games, apps, and videos.



Smoke Alarms... Should be Installed:

- Within every bedroom
- Within 6 feet of every sleeping area
- And on every level of your home.

Smoke Alarms at Home



SMOKE ALARMS ARE A KEY PART of a home fire escape plan. When there is a fire, smoke spreads fast. Working smoke alarms give you early warning so you can get outside quickly.

SAFETY TIPS

- Install smoke alarms in every bedroom. They should also be outside each sleeping area and on every level of the home. Install alarms in the basement.
- Large homes may need extra smoke alarms.
- It is best to use interconnected smoke alarms. When one smoke alarm sounds, they all sound.
- Test all smoke alarms at least once a month. Press the test button to be sure the alarm is working.
- Current alarms on the market employ different types of technology including multi-sensing, which could include smoke and carbon monoxide combined.
- Today's smoke alarms will be more technologically advanced to respond to a multitude of fire conditions, yet mitigate false alarms.
- A smoke alarm should be on the ceiling or high on a wall. Keep smoke alarms away from the kitchen to reduce false alarms. They should be at least 10 feet (3 meters) from the stove.
- People who are hard-of-hearing or deaf can use special alarms. These alarms have strobe lights and bed shakers.
- Replace all smoke alarms when they are 10 years old.

FACTS

- ! A closed door may slow the spread of smoke, heat, and fire.
- ! Smoke alarms should be installed inside every sleeping room, outside each separate sleeping area, and on every level. Smoke alarms should be connected so when one sounds, they all sound. Most homes do not have this level of protection.
- ! Roughly 3 out of 5 fire deaths happen in homes with no smoke alarms or no working smoke alarms.



NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

How to make a Home Fire Escape Plan



FIRE PREVENTION WEEK™

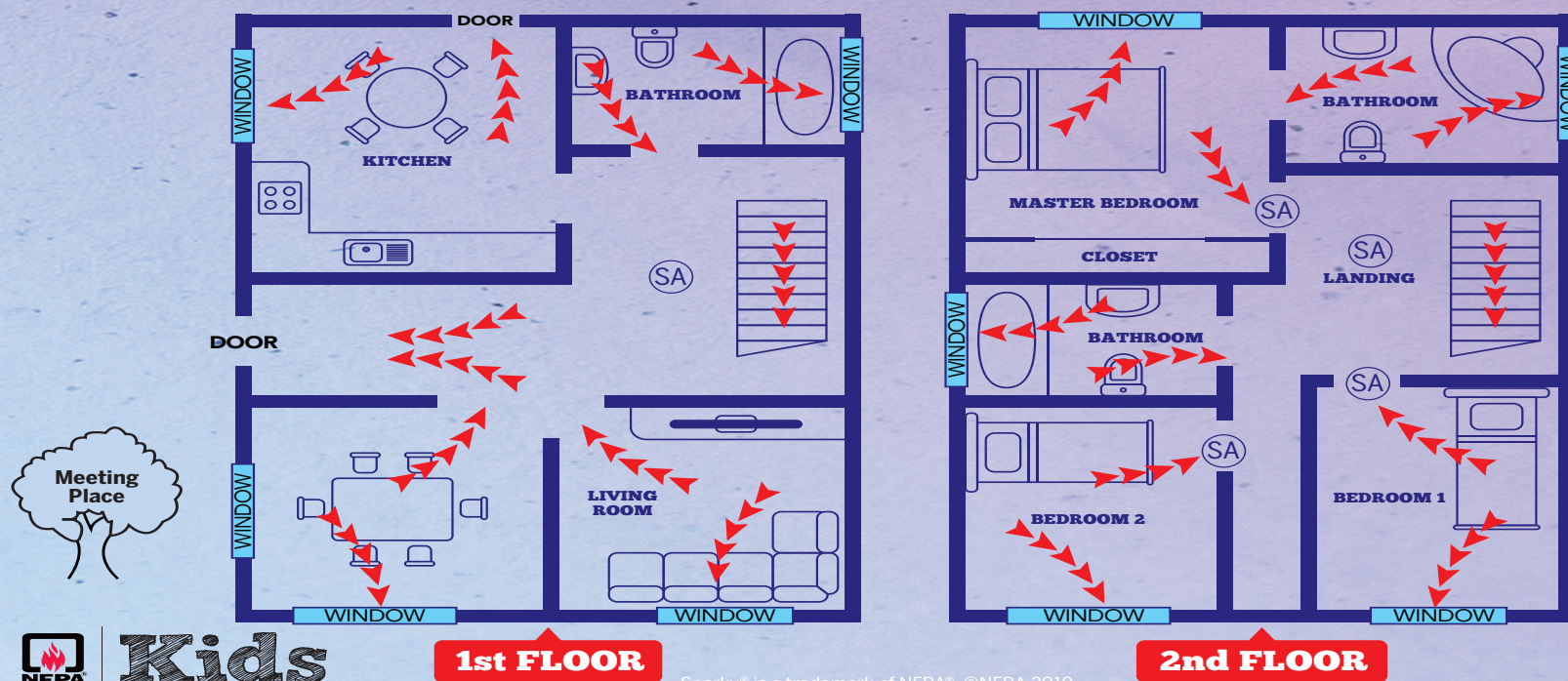
NFPA® — The Official Sponsor of Fire Prevention Week Since 1922



Visit Sparky.org for more activities!

- ☐ Draw a map of your home. Show all doors and windows.
- ☐ Visit each room. Find two ways out.
- ☐ All windows and doors should open easily. You should be able to use them to get outside.
- ☐ Make sure your home has smoke alarms. Push the test button to make sure each alarm is working.
- ☐ Pick a meeting place outside. It should be in front of your home. Everyone will meet at the meeting place.
- ☐ Make sure your house or building number can be seen from the street.
- ☐ Talk about your plan with everyone in your home.
- ☐ Learn the emergency phone number for your fire department.
- ☐ Practice your home fire drill!
- ☐ Make your own home fire escape plan using the grid provided on page 2.

Sample Escape Plan



Kids

1st FLOOR

2nd FLOOR

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2019 Fire Safety Newspapers in Education Quiz

Fireplace Safety

Gas fireplace glass doors can reach _____ Degrees Fahrenheit.

Doors can remain hot for how much time after use? _____

Ouch! That's HOT!

What are the 4 most common types of fire?

A scald burn can occur from hot chocolate or coffee in less than ____ seconds!

Classification and Treatment of Burns

How many classifications of burns are there?

- 1) 1
- 2) 3
- 3) 5

List three symptoms of a second-degree burn?

What are three things that can cause a third-degree burn?

How Fire Sprinklers Work

Smoke will activate Fire Sprinklers:

True or False

Only the Sprinkler nearest to the fire activates:

True or False

Fire Sprinklers release approximately ____ - ____ Gallons of water per minute

Water from a fire hose from a Fire Truck will release approximately ____ or more gallons of water per minute

UL XLPLORLABS Fire Forensics: Claims and Evidence

What are three elements of a fire?

If you eliminate one element will the fire go out? Yes or No

What are the four stages of Fire Development?

Ventilation often makes a fire bigger or smaller? _____

**Ready for a challenge? Enter the Fire Lab at www.ulxplorlabs.org*

What Do You Know About Fire?

Smoke alarms should be installed inside and outside of each _____ area and on every _____ of your home.

Test your smoke alarms every

- 1) Day
- 2) Month
- 3) 6 Months
- 4) Year

Fire can spread rapidly, leaving families as little as _____ minutes to escape.

If the smoke alarm sounds _____ out and _____ out!

Home Escape Plan

How many ways should you be able to get out of each room? _____

What is the emergency phone # to call in case of a fire? _____

You should have a meeting place outside of your house. True or False

Energy Safety from We Energies

What does natural gas smell like?

What does it mean when you see a Mr. Ouch Sign? _____

Electricity + _____ = DANGER



PREPARATION • PREVENTION • PRACTICE

Our Home is *Fire Safe!*

The student named below has successfully completed the Fire Safety Home Survey exercises with their family, and their home is now a certified "Fire Safety Zone." Please hang this certificate proudly in your home to remind you to always maintain your fire safety plan.

Student's Name

I promise to be aware of fire safety and to practice fire safety at all times.

Student Signature

Parent or Guardian Signature

Teacher Signature

- I have performed the Fire Safety Home Survey exercises with my family and I will save and display this certificate in my home.
- I know to call 911 in the event of a fire.
- Our family has a fire escape plan, our home has smoke alarms and we pledge to maintain them on a regular schedule.
- I will not play with matches or lighters.
- My family and I have inspected our home, including our basement, attic and garage and certify that we have not identified potential fire risks.



Wisconsin Insurance Alliance



Poster Contest Entry Coupon

Only students in 1st-12th grade are eligible to enter.

Student's name _____

School _____

Teacher's name _____

Teacher's email _____

Grade _____

School phone _____

School address _____

City, state, zip _____

Please mail entries to:

Professional Fire Fighters of Wisconsin

Charitable Foundation

321 E. Main Street, Suite 200, Madison, WI 53703

Energy safety

from We Energies

Electricity and natural gas are important parts of your daily life. You use them to heat your home, cook your food and power things like TVs and computers. That's why it's important to use energy safely. Follow these rules to stay safe around electricity and natural gas:



Natural gas smells stinky — like rotten eggs.

If you smell natural gas, do not use a light switch or even a phone, which could make a spark and cause a fire or explosion. Get everyone out of the house and tell a trusted adult to call We Energies for help.

Stay away from power lines. Stay far away from all power lines — especially when they're lying on the ground. Never climb trees or fly kites near power lines. And don't release metallic balloons outdoors — they may touch power lines, causing fires and outages.

Outlets are for plugs.

Don't put your fingers or any object other than a plug into an electrical outlet. And keep electrical appliances away from water. Electricity + Water = DANGER.



Mr. Ouch means danger.

Never play near electrical equipment such as substations, power poles or transformers (green boxes). When you see Mr. Ouch, don't touch.



Call before you dig. Before doing any digging or planting in your yard, have an adult call Diggers Hotline at 811 to have the electric and natural gas lines in the ground marked for free. And don't pull out marker flags until the work is complete; others working in your yard may need to know where underground utilities are located to avoid a dangerous accident.



Go to we-energies.com for more energy safety information.

Energy you can depend on



"IT'S FIRE PREVENTION WEEK!"
This year I'm teaching everyone about the importance of planning and practicing your home fire escape plan. But I can't do it alone, I need your help. Work with your family and complete the fire escape checklist."



✓ **Fire Escape Checklist**

- ☐ Do you have working smoke alarms in your home?
- ☐ Is there a smoke alarm in every sleeping room and outside each sleeping area?
- ☐ Is there a smoke alarm on each level of the home, including the basement?
- ☐ Do you test your smoke alarms at least once a month? (Have a grown-up push the test button to check if the batteries work.)
- ☐ Do you know the sound of your smoke alarms?
- ☐ How old are your smoke alarms? (If they're more than 10 years old, you need new ones.)
- ☐ Does your family have a home fire escape plan?
- ☐ Do you know two ways out of each room in your home?
- ☐ Do you know what to do when you hear your smoke alarm? (Get out and stay out.)
- ☐ Are all the exits in your home clear of trash and toys?
- ☐ Has your family picked a meeting place outside the home where everyone can go when they've escaped a fire?
- ☐ Does everyone at home know how to call the fire department once they are outside?
- ☐ Do you and all family members practice your escape plan at least twice a year?

**For more
information visit
firepreventionweek.org
sparky.org**





26th Annual



This program is recommended by the Wisconsin Department of Safety and Professional Services to comply with s. 101.14(1)(c) Wis. Stats, regarding a form of a course of study in fire prevention for use in public schools.

Professional Fire Fighters of Wisconsin Charitable Foundation

Summer Camp for Burn Injured Youth

Each August, the Professional Fire Fighters of Wisconsin Charitable Foundation Burn Camp takes place at Camp Timber-lee just outside of East Troy, Wisconsin. This free, weeklong summer camp provides a fun, continuation of care program for kids with life-changing burn injuries by promoting healing, peer support, and life beyond their injuries. Each year our steering committee works year-round to plan a new Burn

Camp theme that makes each child's experience fresh, unique, and more impactful.

In addition, the hard work and participation of more than 100 burn survivors and volunteers make this camp special for everyone who attends.

We need help to spread the word about Burn Camp so we can help more young Burn Survivors that may not know about camp.

Please contact us for more information or refer a burn survivor.

(608) 630-8440 or Melissa@pffwcf.org

Connect with us!

The Professional Fire Fighters of Wisconsin Charitable Foundation is working to create a fire-safe and burn-free Wisconsin. For 22 years the Milwaukee Journal Sentinel has been a partner on this award winning program that saves lives through education. The fun and engaging content within these pages teaches students about fire and burn prevention, gas and electrical safety, and risk reduction in their homes. Please share with us how you are using our Fire Safety Newspapers in Education program at home and at your school.



@pffwcf



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#WIBurnCamp

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This educational supplement is designed to provide the public with general information on fire safety. The Professional Fire Fighters of Wisconsin Charitable Foundation, Milwaukee Journal Sentinel and sponsors of this section assume no liability for any actions taken by persons based on the information contained herein.

NIE Supervisor:
Andrew Johnson

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